



# CRAN

Communications Regulatory Authority of Namibia

Reaching universal access and service objectives through the  
assignment of 800MHz and 700MHz spectrum

Discussion Paper

DRAFT FOR CONSULTATION

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## Abbreviations

4G	fourth-generation mobile
ACT	Act No 8 of 2009
BC	Beauty Contest
dBm	dBm or dBmW (decibel-milliwatts) is a unit of level used to indicate that a power level is expressed in decibels (dB) with reference to one milliwatt (mW).
MSP	Managed Spectrum Park
MTC	Mobile Telecommunications Limited
RAN	Radio Access Network
TN	Telecom Namibia
UAS	Universal Access and Service
USF	Universal Service Fund
USO	Universal Service Obligation



# 1. Introduction

This document is an update to the 2020 Universal Access and Service Study Report and explores ways to use the 800MHz spectrum bands to achieve universal access and service objectives (UAS). With a combination of the following principles, substantial progress can be made:

- a. Licensees would be able to increase coverage for people, clinics and schools if authorized to use 800MHz;
- b. Using low reserve prices for spectrum auctions or using clearly and transparently defined beauty contests, more money for investment in infrastructure will be available in the sector;
- c. Managed Spectrum Parks can be used as a mechanism to increase private investment, local participation and safeguard competition.

This study proposes three concepts that all satisfy the objectives of the Communications Act and ensure the speedy deployment of the 800MHz spectrum in an equitable, efficient and fair manner. Two of the proposed concepts also entail mechanisms to increase private investment, local participation and safeguard competition in an innovative way.

The 700MHz currently does not have the same relevance as the 800MHz band for UAS purposes in Namibia. However, it may be assigned at the same time as the 800 MHz band to provide more choices for licensees and because the value to operators of the 800MHz and 700MHz bands are linked.

## Disclaimer:

- ✓ The concepts proposed in this discussion paper are for consideration by licensees to reach consensus on the best approach to assign spectrum in the digital dividend. Once agreed, the Authority will follow the procedure as set out in the licensing procedure regulations and the Communications Act to assign the spectrum.
- ✓ This draft discussion paper was developed to form the basis of engagement with licensees only and should not be used to raise expectations of spectrum assignment to any licensee, as such assignments will only be done in terms of the Communications Act and regulations.
- ✓ Reference to certain licensees receiving certain amounts of spectrum does not denote preferential treatment or raise expectations, it is done only because the object is to assign spectrum in a manner that increases coverage, with due regard to current levels of market concentration.
- ✓ The Authority reserves all its rights to issue spectrum as per the relevant provisions of the Communications Act.

## 2. Broadband Population Coverage

This document is an update to the 2020 UAS study, which was presented to stakeholders on 8 August 2022. This update incorporates suggestions from the industry regarding the modelling of network coverage and spectrum allocation. It analyses broadband coverage gaps based on updated RAN site and antenna data from the telecommunications licensees and more conservative parameters for the radio propagation model than previously used.

*Table 1: Update to the radio propagation model*

		4G	3G	2G	Intervention
Dominant Handset mode		Lying in free space	Browsing holding in hand	By the head (BHH)	Free Space
GSMA (in dBm)		-94	-99	-97	-94
Radius in km	900MHz	12	10	15	12
	1800MHz	8	8	10	6
	2100MHz	6 (no antennas in this band)	6	8 (no antennas in this band)	
	2600MHz	4	4 (no antennas in this band)	6 (no antennas in this band)	
Source		GSMA: <a href="https://www.gsma.com/newsroom/wp-content/uploads/TS.24-v4.0.pdf">https://www.gsma.com/newsroom/wp-content/uploads/TS.24-v4.0.pdf</a>			

For the 2020 UAS study, a generic 12km radius was used for 4G. This updated uses 12km for the 900MHz, 8km for the 1800 MHz and 4km for the 2600 MHz spectrum bands. The new radio propagation model also uses more conservative dBm of -94 compared to the previous dBm of -110. On the one hand, the expansion of network infrastructure by licensees, during the past two years, meant that several coverage gaps were closed. On the other hand, using more conservative parameters will mean that the overall coverage for Namibia will be less than what was reported in the 2020 UAS study.

*Table 2: Mobile infrastructure*

	MTC				TN				Total		
	2020		2022		2020		2022		2020	2022	growth
	#	MS	#	MS	#	MS	#	MS			
2G cells	3,051	77%	3,195	81%	933	23%	763	19%	3,984	3,958	-1%
3G cells	6,847	89%	8,983	92%	831	11%	817	8%	7,678	9,800	28%
4G cells	2,140	63%	2,707	68%	1,273	37%	1,270	32%	3,413	3,977	17%
RAN sites	945	74%	989	75%	330	26%	330	25%	1,275	1,319	3%
Source: CRAN portal, Note: MS = Market Share											

Paratus currently only has 40 RAN sites and only provides 4G services.<sup>1</sup> TN has not built new RAN sites in the past two years, and its number of 2G, 3G and 4G cells in operation declined. MTC built new RAN sites and increased 4G cells. Its 4G cells increased from 2,140 in 2020 to 2,707 in 2022, a 26.5% increase. MTC's market share in 4G cells is close to 70%.

Given the market concentration and current coverage levels, it is paramount that exiting operators get 800MHz spectrum, in order to increase universal service and access. This would ensure that mobile broadband coverage is extended to the largest number of Namibians in an efficient and speedily manner. It increases 4G population coverage, lowers the cost per broadband subscriber, and ensures that more schools and clinics would be covered with 4G.

*Table 3: Population Coverage as of September 2022*

	Population	4G Population coverage	Policy Objective of minimum of 80%	People not covered by 4G
!Karas	88,477	81%	Above	17,194
Erongo	216,727	94%	Above	12,630
Hardap	96,016	77%	Below	22,157
Kavango East	163,061	83%	Above	28,330
Kavango West	91,834	59%	Below	38,005
Khomas	472,107	97%	Above	12,346
Kunene	109,021	41%	Below	64,320
Ohangwena	273,209	93%	Above	20,378
Omaheke	79,370	57%	Below	34,020
Omusati	268,337	95%	Above	12,964
Oshana	200,565	98%	Above	3,468
Oshikoto	214,012	80%	Below	42,687
Otjozondjupa	163,536	75%	Below	41,515
Zambezi	107,692	78%	Below	23,508
Namibia	2,543,965	85%	Above	373,524

MTC and Telecom Namibia have extensive network coverage in all of Namibia's regions. Both MTC and TN are national mobile broadband operators covering all of Namibia's regions, while MTC has a larger footprint. Population coverage for Namibia is 89% for 3G and 85% for 4G, which is low compared to South Africa and even the Southern African averages. Seven out of 14 regions had 4G population coverage of below 80%. Kunene had less than 50% 4G population coverage while Kavango West and Omaheke had below 60% population coverage.

<sup>1</sup> CRAN does not have any information about the 4G cells of Paratus.

The National Broadband policy's objective of 80% population broadband coverage has been reached at a national level. However, some regions lag behind, most notably Kunene, with only 41% 4G population coverage. The Hardap, Kunene, Kavango West, Omaheke, Otjozondjupa and Zambezi regions also fall short of the UAS objective of 80% broadband coverage.

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### 3. 800MHz spectrum to expand broadband coverage

Universal access and service objectives can be achieved by using the 800 MHz spectrum band. One way to increase coverage is by granting MTC and TN, (subject to application procedure of course), with 10MHz uplink and 10MHz downlink of 800MHz, which would provide 4G coverage to an additional 57,400 Namibians at no cost to CRAN, assuming that all current 4G cells would use it (Table 4). The 4G population coverage would increase by 3% due to the wider signal reach of 800MHz compared to 1800MHz or higher.

*Table 4: Coverage increase if only current 4G cells are upgraded to use 800MHz*

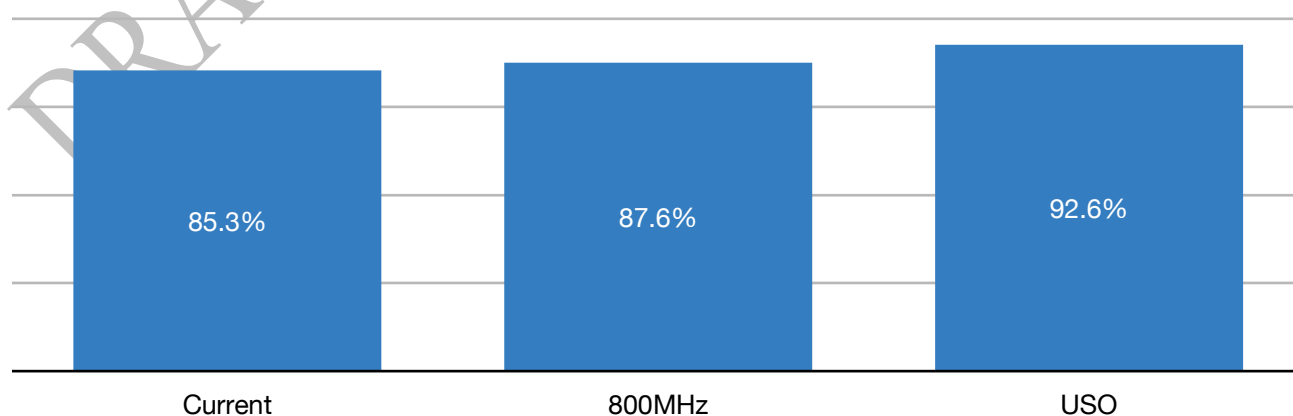
	Current			Simulated coverage if 800MHz is used at all current 4G cells		Change in population not covered by 4G
	Population	4G Population coverage	People not covered by 4G	4G Population coverage	People not covered by 4G	
!Karas	88,477	81%	17,194	81%	17,142	-52
Erongo	216,727	94%	12,630	95%	11,800	-830
Hardap	96,016	77%	22,157	78%	21,089	-1,068
Kavango East	163,061	83%	28,330	88%	19,536	-8,794
Kavango West	91,834	59%	38,005	67%	29,959	-8,046
Khomas	472,107	97%	12,346	98%	11,522	-825
Kunene	109,021	41%	64,320	44%	61,588	-2,733
Ohangwena	273,209	93%	20,378	95%	14,018	-6,360
Omaheke	79,370	57%	34,020	59%	32,355	-1,665
Omusati	268,337	95%	12,964	96%	10,574	-2,390
Oshana	200,565	98%	3,468	99%	1,178	-2,290
Oshikoto	214,012	80%	42,687	88%	26,633	-16,055
Otjozondjupa	163,536	75%	41,515	77%	37,822	-3,694
Zambezi	107,692	78%	23,508	81%	20,900	-2,609
<b>Namibia</b>	<b>2,543,965</b>	<b>85%</b>	<b>373,524</b>	<b>88%</b>	<b>316,115</b>	<b>-57,409</b>

The broadband coverage gap can be narrowed further if all current RAN sites are upgraded to 4G. The CRAN UAS portal models the sub-national impact for the allocation of 800MHz and linked universal service obligations (USO) based on all RAN sites upgraded to 4G. 4G population coverage would increase to 93%, reducing the number of Namibians living outside of the 4G coverage area from 373,524 to 189,396 (see Table 5). The number of schools that are currently not covered by 4G would drop from 456 to 188, and clinics from 84 to 22. The assignment of 800MHz spectrum to the

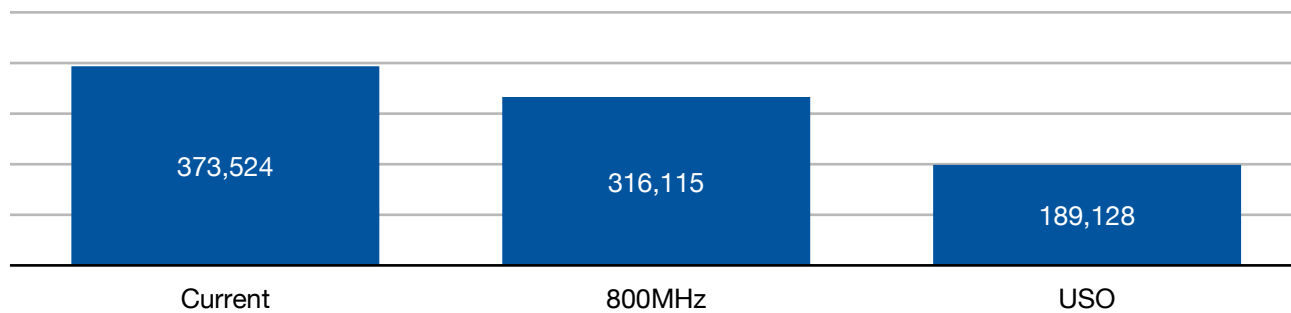
two national operators, MTC and Telecom Namibia, would thus narrow the broadband coverage gap considerably. The Universal Service Fund, once in operation, could then be utilised to close the remaining gaps by subsidising services in areas that are not economically and financially viable.

*Table 5: Coverage increase if all RAN sites are upgraded to use 800MHz*

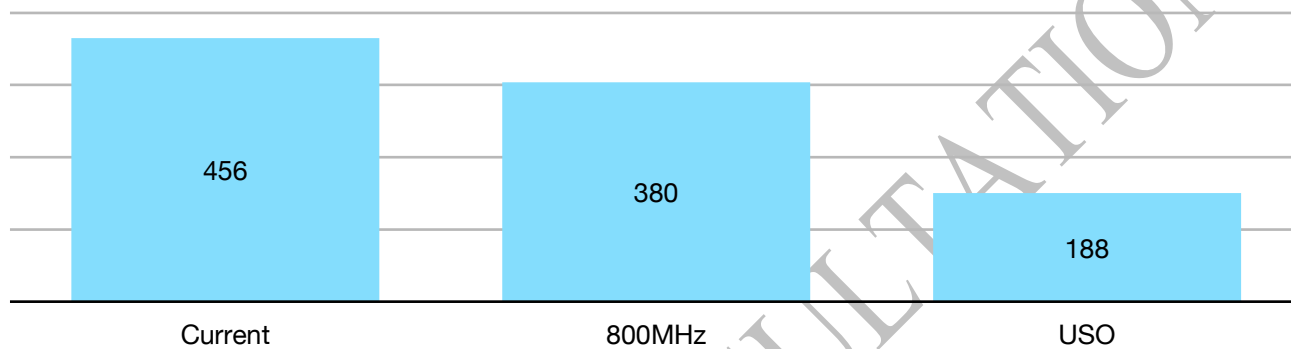
	Curent			800MHz at all RAN sites		Change in population not covered by 4G
	Population	4G Population coverage	People not covered by 4G	4G Population coverage	People not covered by 4G	
!Karas	88,477	81%	17,194	86%	12,388	-4,806
Erongo	216,727	94%	12,630	97%	6,753	-5,877
Hardap	96,016	77%	22,157	85%	14,358	-7,799
Kavango East	163,061	83%	28,330	97%	4,861	-23,469
Kavango West	91,834	59%	38,005	80%	18,775	-19,230
Khomas	472,107	97%	12,346	98%	7,487	-4,859
Kunene	109,021	41%	64,320	68%	35,277	-29,044
Ohangwena	273,209	93%	20,378	96%	9,971	-10,407
Omaheke	79,370	57%	34,020	70%	23,778	-10,242
Omusati	268,337	95%	12,964	98%	6,022	-6,942
Oshana	200,565	98%	3,468	100%	892	-2,576
Oshikoto	214,012	80%	42,687	90%	21,439	-21,248
Otjozondjupa	163,536	75%	41,515	87%	21,869	-19,646
Zambezi	107,692	78%	23,508	95%	5,258	-18,250
<b>Namibia</b>	<b>2,543,965</b>	<b>85%</b>	<b>373,524</b>	<b>93%</b>	<b>189,128</b>	<b>-184,396</b>



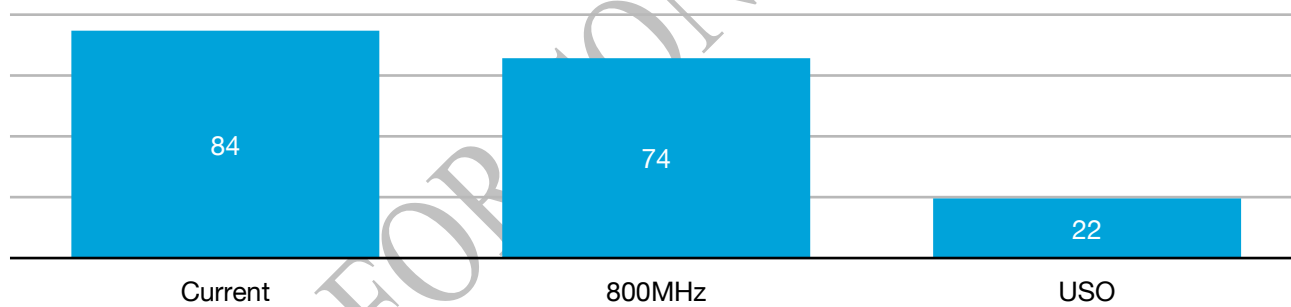
*Figure 1: 4G population coverage*



*Figure 2: Namibians without 4G coverage*



*Figure 3: Schools without 4G coverage*



*Figure 4: Clinics without 4G coverage*

## 4. Principles for the assignment of 700 MHz and 800MHz spectrum

The key to wider broadband coverage is for MTC and Telecom Namibia to both acquire spectrum in the 800MHz band. Also, it is important to maintain fair competition, treat all licensees equal, leave room for new entrants and ensure that smaller licensees also have access to spectrum without compromising efficient spectrum use. The objectives of the Communications Act, as contained in section 2, provide a guide to the design of the spectrum allocation mechanism:

- c) to promote the availability of a wide range of high quality, reliable and efficient telecommunications services to all users in the country;*
- d) to promote technological innovation and the deployment of advanced facilities and services in order to respond to the diverse needs of commerce and industry and support the social and economic growth of Namibia;*
- e) to encourage local participation in the communications sector in Namibia;*
- f) to increase access to telecommunications and advanced information services to all regions of Namibia at just, reasonable and affordable prices;*
- g) to ensure that the costs to customers for telecommunications services are just, reasonable and affordable;*
- h) to stimulate the commercial development and use of the radio frequency spectrum in the best interests of Namibia;*
- i) to encourage private investment in the telecommunications sector;*
- k) to ensure fair competition and consumer protection in the telecommunications sector;*
- l) to advance and protect the interests of the public in the providing of communications services and the allocation of radio frequencies to the public.*

There are multiple ways to achieve these objectives<sup>2</sup> for the assignment of the 700MHz and 800MHz spectrum bands and these are discussed below for discussion with stakeholders.

### 4.1 Managed Spectrum Park

A Managed Spectrum Park (MSP) allows for the assignment of spectrum licences on a shared access basis. This proposal is based on a similar concept implemented by the Ministry of Business, Innovation and Employment, New Zealand to assign spectrum in the 2575-2620 MHz spectrum band.<sup>3</sup> In the case of Namibia, the MSP will be considered for the 700MHz and 800 MHz spectrum band, allowing for an increase in the number of operators, smaller licensees and new players that can access the 700MHz and 800MHz bands. The MSP would be managed by CRAN and the spectrum would be assigned administratively on a per-site level. This safeguards competition and facilitates private investment and

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<sup>2</sup> The above objectives were considered in setting out the strategic context of the Spectrum Assignment Strategy 2022-2024 as published in Government Gazette No. 7876 on 10 August 2022.

<sup>3</sup> Managed Spectrum Park Allocation Rules, Managed Spectrum Park Licence Agreement and Managed Spectrum Park Rules, <https://www.rsm.govt.nz/projects-and-auctions/expressions-of-interest/managed-spectrum-park>

local participation. Community networks may utilise the spectrum at a single local site only, for example.

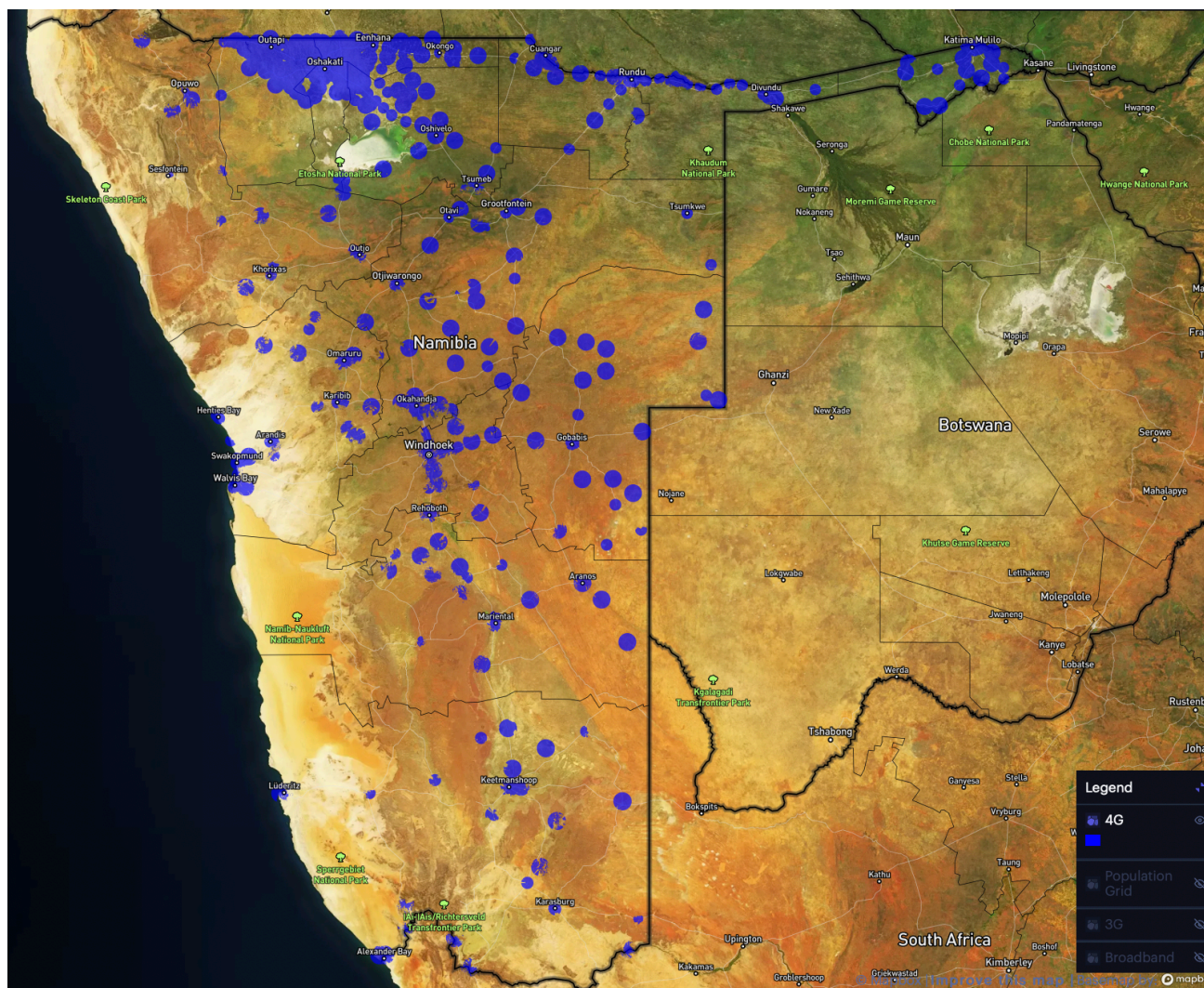
The rules for applications will be set out in a public notice. Applicants can view spectrum availability on the GIS portal and apply for spectrum through the portal. CRAN will confirm whether a proposed location would interfere with other spectrum use and assign spectrum on a first-come, first-serve basis. However, the allocation will only take place once a month and all applications received during the past 30 days will be considered having been received at the same time. A mechanism will be designed to deal with locations for which multiple applications are received. The mechanism may include commercial settlements and auctions. The MSP of New Zealand may serve as a guide. Spectrum is given out strictly on a use-it-or-lose-it policy. Spectrum, that is not utilised within six months after the award will be taken back by CRAN. The fees for a spectrum licence for the MSP will be reasonable. Setting up the MSP would not slow down the assignment of the 700MHz and 800MHz spectrum bands. The precise details of the MSP are part of a follow-up study and specific regulations will be drafted following an intensive stakeholder consultation.

The MSP can either have its own spectrum block or it can allocate the spectrum for areas where spectrum is not used by existing RAN sites. The former is more predictable and supports operators that are working towards national coverage. Allocating a spectrum block to the MSP encourages competition with existing national players but comes at the cost of less spectrum efficiency. A MSP based on unused location-based spectrum is more spectrum efficient because the entire band would be available for areas without RAN sites. Licensees that are the sole providers of broadband services in an area can use the full 60 MHz (30MHz uplink and 30MHz downlink) of the available spectrum rather than just their own allocation. The next section will discuss concepts that make use of both mechanisms for spectrum allocation to the MSP.

## 4.2 RAN site-based spectrum licences

Namibia is a sparsely populated country, and national spectrum licenses may not be efficient. Figure 5 displays 4G network coverage for Namibia. The areas with no blue dots indicates the large areas where the 4G spectrum is currently not used. While these are even less populated areas compared to those covered by signal, it does not mean that some innovative way to use the spectrum cannot be found for those areas.





*Figure 5: 4G coverage*

RAN site-based spectrum licenses award spectrum to a licensee for only those areas where the licensee has infrastructure. In areas where the licensee does not have RAN sites, the spectrum may be used by another licensee. The secondary use of the spectrum would be managed by the MSP subject to the rules of the MSP and CRAN's spectrum licensing regulations. This means that a licensee may use up to 60MHz (30MHz uplink and 30MHz downlink) of spectrum for a location where it is the only provider of services. It means more dynamic and efficient spectrum use throughout Namibia.

RAN site-based spectrum licenses provide a rollout incentive. National licenses do not provide such an incentive and thus need to be combined with Universal Service Obligations to safeguard that the assigned spectrum is fully utilised.

### 4.3 Universal Service Obligations (USOs)

The USO needs to be impartial while achieving the objectives of faster and wider broadband coverage. USOs must apply regardless of whether the operator is an existing operator with a national network, or a new entrant without any network. Obligations are adjusted according to the level of infrastructure and to ensure that 4G rollout is as fast and efficient as possible. Roll-out obligations are a combination of the number of 4G RAN sites and a percentage of RAN sites providing 4G services. Table 6 below, provides an example of such a USO. A new entrant, for example, would automatically comply with the

second condition, but would need to invest to comply with the 1st condition, that is, the requirement of rolling out at least 50 sites in Year 1. An operator with an existing national network would easily meet the first condition but need to upgrade its sites to meet the second condition that 70% of its sites are 4G enabled.

*Table 6: USO conditions*

	<b>1st condition: Number of RAN sites 4G or better</b>	<b>2nd condition: Share of RAN sites with 4G or better</b>
Year 1	75	70%
Year 2	100	80%
Year 3	125	90%
Year 4	150	95%
Year 5	200	99%

Combining these two conditions means expanded broadband coverage, independent of network status of the operator, that is awarded the spectrum licence. The first condition means that new entrants would need to either build new RAN sites rapidly or enter into an infrastructure-sharing agreement with existing MNOs. Telecom Namibia would only be required to upgrade its RAN sites in year five, MTC would not have to do anything to comply, and Paratus would have to roll out 25 RAN sites in year one or enter into an infrastructure sharing agreement. The 2nd condition requires Telecom Namibia and MTC to upgrade their 3G networks from year one, while Paratus would not have to do anything since it has 4G+ only network. The same would apply to a new entrant.

A USO needs to be enforceable. Enforcement is via high penalties for each month that compliance with the USO is missed. Licensees are aware of these penalties from the beginning and this should mean that licensees carefully consider whether to bid. This also reduces the risk of spectrum hoarding or speculating using spectrum licenses to increase company value.

## 4.4 Summary

The table below maps the three design components of MSP, USO and RAN site-based spectrum allocation to the objectives of the Act.

*Table 7: assessing design elements for contributing to objectives of the Act*

Objective	USO	RAN site-based spectrum licenses	MSP
c) to promote the availability of a wide range of high quality, reliable and efficient telecommunications services to all users in the country	Requires building new RAN sites and / or upgrade of RAN sites	More spectrum may be used where there is only one provider.	Smaller MNOs & ISPs can complement national networks
d) to promote technological innovation and the deployment of advanced facilities and services in order to respond to the diverse needs of commerce and industry and support the social and economic growth of Namibia	USO with attached penalty safeguard that advanced technologies are being deployed across Namibia	Leaves spectrum available for innovation	Leaves spectrum available for innovation
e) to encourage local participation in the communications sector in Namibia	Encourages expansion of existing local networks.	Leaves spectrum available for local participation and community networks (ISPs)	Leaves spectrum available for local participation and community networks (ISPs)
f) to increase access to telecommunications and advanced information services to all regions of Namibia at just, reasonable and affordable prices	Increases 4G population coverage from 85% to 93%	Smaller MNOs & ISPs can complement national networks	Smaller MNOs & ISPs can complement national networks
g) to ensure that the costs to customers for telecommunications services are just, reasonable and affordable	800MHz band will reduce cost per subscriber for RAN sites due to wider coverage of signal		
h) to stimulate the commercial development and use of the radio frequency spectrum in the best interests of Namibia	USO with attached penalty safeguard that advanced technologies are being deployed across Namibia	High spectrum efficiency, the spectrum of a licensee can be allocated on geographical basis where not used by a licensees	Keeps spectrum available to new entrants and new computers on sub national level.
i) to encourage private investment in the telecommunications sector	USO requires to either invest into new RAN sites or upgrade existing ones to 4G or better.	MSP keeps the door open for private investment. (The RAN site-based licence includes a MSP as well.)	
k) to ensure fair competition and consumer protection in the telecommunications sector		MSP keeps the door open for new competitors (The RAN site-based licence includes a MSP as well.)	
l) to advance and protect the interests of the public in the providing of communications services and the		Highest possible spectrum efficiency that benefits existing MNOs as well as new entrants	MSP keeps door open for new entrants



Objective	USO	RAN site-based spectrum licenses	MSP
allocation of radio frequencies to the public.			

## 5. Spectrum licensing concepts

The 700MHz does not have the same relevance as the 800MHz band for UAS purposes in Namibia currently. The 700MHz and 800MHz spectrum band, commonly known as the 1<sup>st</sup> and 2<sup>nd</sup> dividend, possess the necessary technical characteristics to allow for deployment of mobile broadband services in rural areas. Both these spectrum bands provide for wide coverage areas and offer the ability to provide high-quality broadband services for outdoor and indoor settings. However, most handsets in the Namibian market currently cannot utilise 700MHz. In particular, for rural areas and those areas that are currently not covered by 4G, 700MHz handsets are unlikely to be in use for the next five years.

The 700MHz is valuable for 5G deployments. It could be auctioned at the same time as the 800 MHz band to provide more choices for licensees and because the value to operators of the 800MHz and 700MHz bands are linked. In total, 60MHz, 30MHz uplink and 30MHz downlink is available in the 700MHz band.<sup>4</sup> Given the lesser relevance for UAS purposes, this spectrum is best auctioned in combination with the MSP. The MSP approach safeguards competition and efficiency in spectrum use going forward.

CRAN proposes three assignment concepts that would all increase 4G population coverage for provision of mobile broadband services. All of these mechanisms provide an opportunity for MTC and TN to get 800MHz spectrum. The difference between the concepts lies in the way each concept delivers on the objectives of the Communications Act.

- **Concept 1:** Allows for the award of national spectrum licenses for 10 years in accordance with regulation 6 of the spectrum licensing regulations via a spectrum auction based on the beauty contest model. The licences are to be awarded subject to licence conditions to ensure rollout of broadband services to unserved and underserved areas and educational and health institutions as derived from the business case and technical roll-out plan submitted by the licensee. This will be crafted with due regard to the gap analysis issued by CRAN, to ensure that the impact is tracked.
- **Concept 2:** Allows for the award of RAN site-based spectrum licenses. It improves the outcome of the SOP in terms of efficiency in spectrum utilisation. It means that even if a smaller licensee obtains a spectrum licence, that spectrum can be re-used by others, where it is currently not in use. It also allows an operator to use a competitor's spectrum in areas where they are not present. Operators, could, for example, apply for an additional uplink and downlink for its a RAN site, where there are no other operators that have RAN sites there. It could obtain the licence for the additional spectrum in the form of MSP licences. Higher spectrum efficiency

<sup>4</sup> See SPECTRUM ASSIGNMENT STRATEGY of the COMMUNICATIONS REGULATORY AUTHORITY OF NAMIBIA 2022-2024

throughout Namibia via the MSP increases private investment, local participation and competition. Concept 2 would not need a USO.

- **Concept 3:** This is the same as Concept 1, only that it retains one lot of 700MHz and one lot of 800MHz for an MSP. The MSP is for the exclusive use for licensees that do not have a national spectrum licence for the respective band. If a licensee, for example, has a national licence for 800MHz but not one for 700MHz, then it could not make use of the 800MHz in the MSP, but it could apply for 700MHz from the MSP. The introduction of the MSP means that new entrants can enter the market. MSP licenses are awarded by RAN site. However, a new entrant could roll out a national network based on the MSP spectrum. The MSP increases private investment, local participation and competition in comparison to Concept 1. Concepts 1 and 3 require a USO to safeguard that the spectrum is used nationwide.

Concepts 2 and 3 place a higher administrative burden on CRAN. At the same time, both concepts improve on the delivery of the objectives of the Act. Concepts 2 and 3 safeguard that new competitors can enter the market using 700MHz and 800MHz spectrum. They also facilitate market entry of smaller licensees for specific locations, making room for community networks and local ISPs to provide mobile broadband services.

**Table 8: Summary of Spectrum allocation concepts**

	Concept 1: National licenses	Concept 2: RAN site-based spectrum licenses with Managed Spectrum Park	Concept 3: National licenses with Managed Spectrum Park
Summary	National spectrum licenses for 10 years in accordance with regulation 6 of the spectrum licensing regulations	Higher spectrum efficiency throughout Namibia and MSP to increase private investment, local participation and competition	Standard operating procedure and MSP to increase private investment, local participation and competition
Lots	Lot 1	800Mhz: 10 MHz uplink and 10 MHz downlink	
	Lot 2	800Mhz: 10 MHz uplink and 10 MHz downlink	
	Lot 3	800Mhz: 10 MHz uplink and 10 MHz downlink	MSP
	Lot 4	700Mhz: 10 MHz uplink and 10 MHz downlink	
	Lot 5	700Mhz: 10 MHz uplink and 10 MHz downlink	
	Lot 6	700Mhz: 10 MHz uplink and 10 MHz downlink	MSP
Type	National licence	Where licensee has RAN sites	National licence
Assignment	Beauty Contest	Beauty Contest	Beauty Contest
Condition	Maximum of 1 lot per licensee per band, i.e., 1 lot in 800MHz and 1 lot in 700MHz bands.		
Managed spectrum Park	None	Where there are no RAN sites using a particular spectrum band. Licensees may reserve their spectrum for planned sites for up to 1 year.	Lots 3 and Lot 6

	Concept 1: National licenses	Concept 2: RAN site-based spectrum licenses with Managed Spectrum Park	Concept 3: National licenses with Managed Spectrum Park
Universal Service Obligation	Covered through licence conditions based on the business plan.	No	Yes
Competition	High: ensure equitable access to spectrum for up to 4 licensees	Higher: unused spectrum can be used by competitors	Highest: MSP is only for licensees without spectrum in respective band
Rollout pressure	Universal Service Obligation with penalties	Competitor can use spectrum where licensee does not have infrastructure	Universal Service Obligation with penalties
Spectrum Efficiency	Medium: Spectrum is only used where licensee has RAN sites	Highest: MSP can award up to 60MHz to unserved locations in each band	Medium: Spectrum is only used where licensee has RAN sites
Local participation	Low: ICT sector is currently dominated by state	High: through MSP	High: through MSP
Private investment	Low: ICT sector is dominated by state currently	High: through MSP	High: through MSP
Spectrum fees	Annual formula-based fees as per regulations		
MSP fees	NA	Reasonable admin fee per RAN site	
Licence Duration	10 years	10 years 5 years for MSP licence	10 years 5 years for MSP licence

The award of the spectrum licenses is per the current regulations.

## 6. Conclusion

In the interim, Universal Access and Service objectives can be accomplished without a USF by using 800MHz spectrum, the establishment of managed spectrum park (MSP) and the universal service obligations. The MSP is an innovative solution to allocate spectrum to the incumbent mobile operators without preventing market entry, local participation or small licensees from offering 4G broadband services. The three concepts differ in how well they attain the objectives of the Communications Act. RAN site-level spectrum licenses are best for the efficient use of spectrum. Spectrum dedicated to the MSP, which incumbents may not use, is best for new entrants.

The key to universal access and service is that operators can deploy 800MHz spectrum efficiently. Awarding operators with 20MHz in the 800MHz band each (10Mhz uplink and 10 Mhz downlink) will:

- Increase their network coverage;
- Lower their cost per customer of providing broadband coverage;
- Provide 57,400 Namibians with 4G coverage through 800MHz use;
- Provide 4G coverage to an additional 127,000 people through the USO; and

- Reduce the number of schools and clinics without 4G coverage by up to 75%.

The MSP entails an additional administrative procedure to CRAN but would also lead to improved spectrum efficiency. The spectrum that is managed by the park may be increased after successful operations and fine-tuning of the administrative procedures.

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