

MULTICHOICE GROUP SUBMISSION

**DRAFT REGULATIONS ON DYNAMIC
SPECTRUM ACCESS AND
OPPORTUNISTIC SPECTRUM
MANAGEMENT IN THE INNOVATION
SPECTRUM**

3800 - 4200MHz AND 5925 - 6425 MHZ

30 MAY 2025

TABLE OF CONTENTS

EXECUTIVE SUMMARY	3
INTRODUCTION.....	9
ICASA'S ROLE IN SPECTRUM MANAGEMENT AND PREVENTING INTERFERENCE	12
SERIOUS RISKS TO EXISTING USERS IN THE BAND	16
ICASA'S PROCESS TO DATE HAS COMPROMISED THE PROCESS AND ITS OUTCOMES	21
ICASA did not make written submissions available and did not conduct hearings	22
In its Findings ICASA did not explain or provide any reasons for its decision to implement DSA in the 3.8-4.2GHz Band	22
ICASA's gathering of technical information in the "implementation phase" was rushed and flawed	24
ICASA back-tracked on the assurances it gave to MultiChoice that stakeholders would be involved in its trials and simulations	26
ICASA's simulations are inadequate	28
FUNDAMENTAL DEFICIENCIES IN THE DRAFT REGULATIONS	32
(1) Draft Regulations do not support technological neutrality or planning for future spectrum needs	32
(2) Impermissible delegation to the USSP and insufficient information about the USSP designation	33
(3) Insufficient transparency and accountability mechanisms built into the Draft Regulations	41
(4) Licensing process is unclear.....	44
(5) Subjecting primary users to interference unless they have registered is unfair and out of step with normal practice.....	45
(6) Insufficient measures to mitigate against interference	50
(7) Non-compliance with s36 of the ECA in respect of technical standards	52
ICASA'S APPROACH IS OUT OF LINE WITH INTERNATIONAL BEST PRACTICE.....	56
United Kingdom.....	56
Europe.....	63
United States of America.....	65
OTHER CONCERNS ABOUT THE DRAFT REGULATIONS	67
OUR RECOMMENDATIONS.....	69
CONCLUSION	70

ANNEXURE A: COMMENTS ON ICASA'S SUMMARY RESULTS OF SIMULATIONS AND TRIALS.....	72
ANNEXURE B: RTS STUDY: PTP STUDY TECHNICAL REPORT	85

EXECUTIVE SUMMARY

- 1 MultiChoice remains profoundly concerned about ICASA's proposals to implement Dynamic Spectrum Access in the 3.8-4.2GHz Band, given the interference that is likely to be caused to our services.
- 2 MultiChoice relies heavily on the Band for our distribution services. We use the sub-band extensively for broadcast, backhaul of international and regional contribution feeds, distribution of feeds for MultiChoice's GOtv (DTT) network in numerous African countries, VSAT communication to GOtv network sites, and access to high-availability feeds for event-based broadcasts. We use C-band spectrum for receiving international channels that are broadcast on both Ku-band and on DTT services in the rest of Africa, in accordance with the frequency spectrum, ECS and ECNS licences issued by ICASA to Orbicom. In addition to MultiChoice, there are numerous other operators that use spectrum in the Band.
- 3 We do not support the sharing of this Band, especially not in the manner proposed by ICASA. 3.8-4.2GHz comprises the full remaining C-band. There is nowhere else, no adjacent band for FSS users like MultiChoice to migrate to, if our activities in this Band are disrupted. And moreover, designating all unused spectrum in the Band as "innovation spectrum" unfairly shuts us out from accessing this spectrum going forward, and therefore prevents the future growth of our services.
- 4 For sharing in the Band to ever work, we believe a prior coordinated case-by-case approach would be required, rather than dynamic spectrum access. As we explain, essential pre-conditions are necessary if the Band is to be used for the sharing of unused spectrum by secondary wireless users in a viable way. Unfortunately, that is not the approach ICASA has taken in the Draft Regulations.

The risk of interference and ICASA's role in preventing it

- 5 ICASA has a statutory obligation to ensure that interference to authorised or licensed users is eliminated or reduced to the extent reasonably possible. It is therefore particularly concerning that ICASA is proposing making regulations

which will create serious harmful interference with damaging consequences for existing users in the Band.

- 6 Our concerns about the risk of interference to the services which are already operating in the Band on a primary basis, including FSS services, are substantiated by the detailed evidence we have submitted to ICASA and international research. The evidence strongly demonstrates that FSS services cannot co-exist with terrestrial services in the Band in the manner proposed by ICASA.
- 7 Studies that have examined shared spectrum access in the Band have concluded that:
 - 7.1 it is not possible to define generic technical conditions that guarantee the protection of fixed service (FS) and fixed satellite service (FSS) in all scenarios. (ECC decision (24)01 p2); and
 - 7.2 careful planning and case-by-case analysis is needed, in combination of considering appropriate mitigation techniques, to ensure the protection of current and future deployment of FSS and FS.
- 8 The Draft Regulations prescribed by ICASA must either eliminate interference entirely or reduce interference (not just harmful interference) to acceptable levels determined by ICASA.
- 9 In their current form, the Draft Regulations do neither and the interference which would be caused if spectrum is assigned in this manner will be ruinous to the activities of existing users.

ICASA's process has been flawed

- 10 The process followed by ICASA to date has compromised its ability to address the risks to existing users in the Band. ICASA's process has been characterised by minimal substantive engagement by the regulator on the core issues and little opportunity for stakeholders to participate meaningfully or at all in debates and discussions.

- 11 Even though a number of parties objected to or raised questions about, the implementation of DSA in this Band, ICASA did not engage with these arguments, and its Position Paper did not explain the basis for rejecting these arguments or provide any reasons for its decision to forge ahead with implementation of DSA in the Band.
- 12 The gaps in the Position Paper together with the absence of public hearings (which would have allowed for meaningful debates and discussions), cast doubt on the reliability of ICASA's process and the rationality of the outcomes reached as does the rushed and flawed manner in which ICASA gathered technical information in the "implementation phase".
- 13 In addition, ICASA back tracked on the assurances it gave to MultiChoice that it (and presumably other stakeholders) would be involved in its trials and simulations, prior to publishing Draft Regulations. MultiChoice was not included in the simulations, despite its request and commitment to participate.
- 14 The simulations which ICASA eventually conducted without our input or involvement, are flawed and inadequate and no reliable conclusions can be reached from them. We catalogue these difficulties in our **Annexure A: Comments on ICASA's Simulations**. Given the gravity of the risks, MultiChoice also commissioned Radio Telecommunication Services (Pty) Ltd ("RTS") as an independent technical expert to conduct a study of ICASA's simulations and to perform link prediction for the various sites, and to prepare a technical report. The "RTS Report" is attached as **Annexure B**. The RTS Report confirms the underestimation of the interference impact in the ICASA simulations and also illustrates the severity of the interference impact on FSS receive points not considered in ICASA's simulations.

The Draft Regulations are fundamentally flawed in numerous respects

- 15 Several fundamental problems render the Draft Regulations fatally flawed and make them vulnerable to legal challenge.
- 16 For instance, the Draft Regulations create a technology-specific regulatory framework which appears to reserve spectrum for specific devices / technology

only and inhibits the growth of existing users in the Band, without taking into account the growth of existing satellite operations.

- 17 They also suffer from fundamental flaws in respect of the USSP. They contain insufficient information about the proposed USSP framework and they effectively outsource essential functions which fall within ICASA's domain, which is an impermissible and unlawful delegation of ICASA's powers, functions and duties.
- 18 The Draft Regulations also lack the necessary accountability, openness and transparency. Interested parties have minimal insight and many aspects of the draft framework are hazy. The licensing and registration provisions are unclear and appear to be out of line with the ECA and the existing radio Frequency Spectrum Regulations.
- 19 On protection from interference, the Draft Regulations irregularly provide that any incumbent or existing user of the Band who is a primary user will not enjoy protection from harmful interference if they fail to register with ICASA. They therefore shift the sole responsibility for resolving interference to unregistered users. There are also insufficient measures in the Draft Regulations to protect incumbent users from "interference" and "harmful interference", both in respect of current usage and future usage of the Band for expansion of services by incumbents.
- 20 Finally, the Draft Regulations lack clear operational specifications and standards prescribed by the Authority in terms of s36 of the ECA.
- 21 It is clear that there are a number of fundamental legal problems with the Draft Regulations in their current form. If ICASA presses ahead with its current approach, in the face of the problems which have been identified, it will undoubtedly be vulnerable to legal challenge.

ICASA's approach is not aligned with international best practice

- 22 Unlike other jurisdictions, ICASA has not ensured that incumbent users are guaranteed their current level of protection or planned for their future use of this Band to guarantee their ability to expand their services down the road. This is

concerning given that South Africa has a greater dependency on C-band for distribution activities than some other more developed jurisdictions.

- 23 A key element of the international cases studies that are focused on spectrum for 5G mobile wireless network or private networks in the 3.8-4.2GHz Band is to recognise the importance and value to consumers of the current incumbents operating in the Band and to ensure that there is no interference to the incumbent users when introducing new users in the Band. The manner in which this is achieved may differ between Europe and the USA, but this core intent remains the same. ICASA does not seem to have taken on board this core intent of protecting current users.
- 24 Ofcom's approach in the UK has been to only license new users in the Band if they cause no interference to satellite operators. Ofcom assesses all applications on case-by-case basis to see if any interference would be caused to, or received from, other licensees (including satellite services) in the Band. Ofcom only grants a licence provided that the application passes this coordination process. Several other regulatory parameters ensure prior coordination and coexistence in the Band.
- 25 In the EU it is clearly accepted that it is not possible to define generic technical conditions that guarantee the protection of FSS. Careful planning and case-by-case analysis is needed, in combination with considering appropriate mitigation techniques, to ensure the protection of current and future deployment of FSS. In addition, large separation distances are typically necessary.
- 26 In the USA, the FCC has decided that sharing in this Band is not effective or efficient and that co-existence would require very large separation distances rendering it difficult for new users to operate. The FCC solution was to repack the incumbent users to the upper portion of the Band and put in a guard band to protect them from interference.

Our recommendations on the way forward

- 27 There are significant problems with the Draft Regulations and the process which was followed to arrive at them. ICASA must now pause and rethink its approach, and give serious consideration to the concerns of current users in the Band.
- 28 If ICASA eventually decides to persist with spectrum sharing in the 3.8-4.2GHz Band, it is essential that it conduct meaningful, reliable and evidence-based simulations in the Band before proceeding with regulations. The additional simulations must look at a much wider range of use cases in order to properly and fully evaluate the impact on existing users of the Band.
- 29 For the simulations to be credible, there must be stakeholder involvement in both the design and implementation phase. There is no justifiable reason for such simulations to be conducted in secret. We suggest that ICASA constitutes a committee with industry representation, to input into the design and to comment on the results such that the final findings from the simulations are fair, objective, meaningful and reliable.
- 30 ICASA must consider the results of the simulations before making a final decision on whether spectrum sharing can in fact be implemented in the Band and the manner in which it should be implemented.
- 31 If the Band is ever going to be effectively utilised for sharing by secondary wireless users, it is crucial that the scope of the secondary use be narrowly defined. Key criteria in this regard are that the sharing be limited to (i) rural areas (in line with ICASA's objective of expanding broadband access to rural, underserved remote communities and bearing in mind that the separation distance that is necessary to prevent harmful interference makes DSA unfeasible in urban areas), (ii) low and medium power transmission, (iii) on a case-by-case basis following prior coordination (rather than an automated one size fits all dynamic approach to DSA), (iv) in line with a rigorous framework, and that (v) sufficient guard bands and other evidence-based interference mitigation protocols are developed with reference to international best practice.

- 32 Numerous extensive amendments are required to the Draft Regulations to make them workable. We suggest that ICASA put the current Draft Regulations on hold until the additional simulations have been properly conducted and consulted on.
- 33 Thereafter, we suggest that ICASA publish a further set of draft regulations, taking into account the comments which have been made by stakeholders on this current draft (e.g. the numerous fundamental flaws which have been identified, including impermissible delegation to the USSP, need for transparency in respect of registration, the licensing arrangements etc).
- 34 A further round of written submissions on the next iteration of the Draft Regulations will be necessary before any publication of final regulations.

INTRODUCTION

- 35 The MultiChoice Group ("MultiChoice"), including its subsidiaries MultiChoice (Pty) Ltd and Orbicom (Pty) Ltd, welcome the opportunity to comment on ICASA's Draft Regulations on Dynamic Spectrum Access and Opportunistic Spectrum Management in the Innovation Spectrum 3800-4200 MHz and 5925 – 6425 MHz (the "Draft Regulations").¹
- 36 MultiChoice has participated in ICASA's prior consultations on this issue. In fact, it was a year ago, in May 2024, that we wrote to ICASA stating that we were gravely concerned about ICASA's proposals to implement Dynamic Spectrum Assignment ("DSA") in the 3.8 – 4.2GHz band ("the Band").
- 37 Unfortunately, the developments over the last 12 months have not alleviated our concerns. We remain profoundly worried about the potential interference with our fixed satellite services ("FSS") active in this Band.
- 38 The Draft Regulations, including the results of simulations conducted by ICASA, give us little comfort that DSA can be implemented without causing interference. In fact, the ICASA simulations are wholly insufficient as basis for regulation

¹ Draft Regulations on Dynamic Spectrum Access and Opportunistic spectrum Management in the Innovation Spectrum 3800-4200 MHz and 5925-6425 MHz published under Notice Number 52415, Government Gazette Number 6066, 28 March 2025

making and are not a reliable basis to inform the approach to dynamic spectrum access.

39 We therefore remain firmly opposed to the implementation of DSA in the 3.8-4.2GHz band as proposed in the Draft Regulations.

40 It is unclear to MultiChoice why ICASA has persisted in the view that this sub-band must accommodate new terrestrial services on a secondary basis via DSA, especially given that:

40.1 There is no evidence of any harmonisation of this Band for DSA in ITU-R region 1; and

40.2 In the consultation process which preceded the publication of ICASA's Findings Document and Position Paper ("Position Paper"),² multiple stakeholders stated they were profoundly concerned about, and opposed to, the use of this Band for DSA. Very few stakeholders explicitly supported the use of this Band for DSA.

41 As ICASA is aware, MultiChoice does not oppose spectrum sharing in principle. We have stated on numerous occasions that we support sharing where it makes sense and coexistence is possible. But we do not support spectrum sharing which risks the operations of incumbent primary users, as it does in this case.

42 We have been equally open-minded on whether DSA is feasible. But we have stressed that, because of the automated nature of DSA, it must be approached cautiously. For sharing in the Band to work, a prior coordinated case-by-case approach is required, rather than dynamic spectrum access, and full collaboration by stakeholders in the creation of accurate and transparent geolocation spectrum databases is paramount. As we explain, essential pre-conditions are necessary if the Band is to be used for the sharing of unused

² Findings Document and Position Paper on the Inquiry into the Implementation of Dynamic Spectrum Access and Opportunistic Spectrum Management, published under Notice Number 50376, Government Gazette Number 4471, 26 March 2024 (the "Position Paper")

spectrum by secondary wireless users in a viable way. Unfortunately, that is not the approach ICASA has taken in the Draft Regulations.

- 43 During the course of this process, MultiChoice has provided detailed technical information and evidence demonstrating the risks it faces. However, the consultation process has been problematic and beset with flaws, as we detail in this submission. As a result our concerns have not been adequately addressed.
- 44 We also show in this submission that ICASA's approach fails to comply with its mandate to reduce and eliminate interference and is out of step with relevant provisions of the Electronic Communications Act, 2005 ("the ECA") as well as relevant international best practice.
- 45 The Draft Regulations are fundamentally deficient in numerous respects. Several fundamental problems with the Draft Regulations render them fatally flawed and make them vulnerable to legal challenge. These flaws go to the heart of the Regulations.
- 46 As but one example, a fundamental feature of the Draft Regulations is to designate an amorphous "unified spectrum switch provider" ("USSP") to provide USS services - effectively appointing a third party to carry out the core functions necessary for the implementation of the DSA framework. This proposal to effectively outsource core functions would constitute an impermissible and unlawful delegation of ICASA's powers, functions and duties. In the face of the risks arising from DSA in the Band, it is alarming that such a significant function is proposed to be outsourced as proposed in the Draft Regulations.
- 47 As a result of the numerous deficiencies in (i) ICASA's approach and (ii) the Draft Regulations, existing lawful users in the Band, such as MultiChoice, face the compounded risks of proposed sharing by secondary users in the Band which -
- 47.1 precludes our growth and expansion in the Band;
- 47.2 creates a considerable risk of serious harmful interference to our services; and

- 47.3 provides grossly insufficient safeguards to prevent and mitigate interference.
- 48 The stakes are simply too high for ICASA to implement DSA in the Band in the manner proposed in the Draft Regulations.
- 49 In an effort to contribute constructively to this process, we make recommendations on how to take this matter forward. We respectfully request that ICASA give our concerns and proposals due consideration.
- 50 We also emphasise that given the gravity of this matter, it is imperative that hearings be held. We confirm that MultiChoice wishes to participate in such hearings.

ICASA'S ROLE IN SPECTRUM MANAGEMENT AND PREVENTING INTERFERENCE

- 51 At the outset, we reflect on ICASA's powers, functions and duties in respect of spectrum management, and ICASA's duty to prevent interference in general, and, even more so, in the context of proposed spectrum sharing regulations.
- 52 ICASA is a creature of statute and is obliged to exercise its powers and perform its functions and duties within the parameters of its empowering statutes, including the ECA.
- 53 In terms of s30(1) of the ECA, ICASA "*controls, plans, administers and manages the use and licensing of the Radio Frequency Spectrum*".
- 54 In doing so, a key function of ICASA is to manage, reduce and indeed, eliminate interference.
- 55 "Interference" is defined in s1 of the ECA as meaning:

"the effect of unwanted energy due to one or a combination of emissions, radiations, or inductions upon reception in a radio communication system, manifested by any –

(a) performance degradation;

(b) misinterpretation; or

- (c) *loss of information,*
which could be extracted in the absence of such unwanted energy"
- 56 The ECA imposes an even greater duty on ICASA in relation to "harmful interference," which is defined as meaning "interference" which:
- "(a) seriously degrades, obstructs, or repeatedly interrupts an electronic communication or broadcasting service operating in accordance with ITU Radio Regulations; or
- (b) *is not within CISPR interference level limits as agreed to or adopted by the Republic".³ (our emphasis)*
- 57 In controlling, planning, administering and managing the use and licensing of the radio frequency spectrum, ICASA must:
- 57.1 comply with the applicable standards and requirements of the ITU and its Radio Regulations, as agreed to or adopted by the Republic, as well as the National Radio Frequency Plan^{4;5}
- 57.2 take into account modes of transmission and efficient utilisation of the Radio Frequency Spectrum, "*including allowing shared use of Radio Frequency Spectrum when interference can be eliminated or reduced to acceptable levels as determined by the Authority"*⁶ and
- 57.3 "*ensure that in the use of the Radio Frequency Spectrum harmful interference to authorised or licensed users of the Radio Frequency Spectrum is eliminated or reduced to the extent reasonably possible*".⁷ (Our emphasis)
- 58 ICASA thus has a statutory obligation to ensure that interference to authorised or licensed users is eliminated or reduced to the extent reasonably possible.

³ s1 of the ECA

⁴ National Radio Frequency Plan, 2021, published under Notice Number 911, Government Gazette Number 46088, 25 March 2022 ("National Radio Frequency Plan")

⁵ s30(2)(a) of the ECA

⁶ s30(2)(b) of the ECA

⁷ s30(3) of the ECA

- 59 Of particular importance to this process is s30(2)(b) of the ECA, which provides for ICASA to allow "*shared use of radio frequency spectrum when interference can be eliminated or reduced to acceptable levels as determined by the Authority*".
- 60 Notably, when it comes to shared use of frequency spectrum:
- 60.1 ICASA may allow for shared use of frequency spectrum only when interference can be eliminated or reduced to acceptable levels.
- 60.2 This proviso applies to all interference, not only harmful interference.
- 61 When embarking on a process such as this to encourage spectrum sharing in a dynamic and opportunistic manner, ICASA⁸ must ensure that it will not result in interference, alternatively ICASA must reduce interference to acceptable levels determined by ICASA.
- 62 It is irrational for ICASA to provide for dynamic spectrum sharing in circumstances where multiple stakeholders have made representations to ICASA raising serious concerns that DSA will cause harmful interference to existing users, which concerns have not been addressed satisfactorily.
- 63 It is simply not good enough to provide, for example, that "*The USSP shall calculate and assign OPs to ISDs to ensure a low probability of harmful interference to incumbent users...*"⁹. (Our emphasis)
- 64 This is both an insufficient measure and an insufficient threshold. The Draft Regulations prescribed by ICASA must either -
- 64.1 eliminate interference entirely; or
- 64.2 reduce interference (not just harmful interference) to acceptable levels determined by ICASA.

⁸ ICASA itself must do this, not the USSP. We will address this concern in more detail later in this submission.

⁹ Draft Reg. 11(4)

- 65 ICASA has not met either of these preconditions for DSA.
- 66 Moreover, as indicated in paragraph 57.1 above, ICASA has an obligation to comply with the applicable provisions of the Radio Regulations as agreed to or adopted by the Republic and the National Radio Frequency Plan. The relevant provisions of both the Radio Regulations and the National Radio Frequency plan require no probability of interference by a secondary service to the primary service:
- 66.1 Spectrum assigned on a secondary basis means that the stations of a secondary service "shall not cause harmful interference to stations of primary services..."
- 66.2 Administrations of ITU Member States shall not assign to a station any frequency except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to a station operating in accordance with the Radio Regulations.¹⁰
- 67 ICASA's proposed criterion of "low probability" is therefore wholly inadequate and non-compliant with both the ECA and the Radio Regulations.
- 68 It is particularly concerning to us, as incumbent users in the Band, that ICASA, which is tasked with managing, reducing and resolving interference, is proposing making regulations which will create serious harmful interference with damaging consequences for existing users in the Band such as MultiChoice.

In summary:

- 69 ICASA has a statutory obligation to ensure that interference to authorised or licensed users is eliminated or reduced to the extent reasonably possible.
- 70 The Draft Regulations prescribed by ICASA must either eliminate interference entirely, or reduce interference (not just harmful interference) to acceptable

¹⁰ See Articles 4.4 and 5.28 of the Radio Regulations, 2024 Edition, which provisions are incorporated by reference in the National Radio Frequency Plan

levels determined by ICASA. In their current form, the Draft Regulations do neither.

- 71 It is particularly concerning that ICASA is proposing making regulations which will create serious harmful interference with damaging consequences for existing users in the Band.

- 72 We reiterate below the risks to incumbent users in the Band.

SERIOUS RISKS TO EXISTING USERS IN THE BAND

- 73 MultiChoice has repeatedly cautioned that, due to the interference which would be caused by the implementation of DSA in the Band, it will be ruinous to the activities of existing users if spectrum is assigned to new secondary users in the Band.

- 74 Our concerns about the risk of interference to the services which are already operating in the Band on a primary basis, including FSS services, are substantiated by the detailed evidence we have submitted to ICASA and international research. The evidence strongly demonstrates that FSS services cannot co-exist with terrestrial services in the Band in the manner proposed by ICASA.

- 75 Studies that have examined shared spectrum access in the Band have concluded that:

75.1 it is not possible to define generic technical conditions that guarantee the protection of fixed service (FS) and fixed satellite service (FSS) in all scenarios. (ECC decision (24)01 p2); and

75.2 careful planning and case-by-case analysis is needed, in combination of considering appropriate mitigation techniques, to ensure the protection of current and future deployment of FSS and FS.

- 76 A key study in this regard was conducted in the EU by the Electronic Communications Committee ("ECC") of the European Conference of Postal and Telecommunications Administrations ("CEPT").¹¹
- 77 The risks have also been acknowledged in other jurisdictions. For example, as we show later, the Office of Communications in the United Kingdom ("Ofcom") assesses all applications on case-by-case basis to see if any interference would be caused to, or received from, other users (including satellite services) in the Band. Ofcom will only license secondary users in the Band if the application passes this coordination and coexistence process.
- 78 A number of parties echoed our concerns in their submissions on the Discussion Paper, as ICASA noted in its Position Paper:
- 78.1 Orbicom raised issues of interference in their assigned spectrum and expressed its disagreement with ICASA's consideration of the 3.8-4.2GHz band for the implementation of DSA.
- 78.2 The SABC expressed the interference challenges it faces in the C-band and explained that a loss of signal at a terrestrial transmission site or anywhere in the transmission path can mean millions of viewers and listeners being affected negatively.
- 78.3 Cell C stated that it is unclear how IMT spectrum would be dynamically shared with other licensees considering the nature of IMT services, complexity and costs associated with IMT technology in the cases of spectrum interference and mitigation techniques.
- 78.4 Sentech supported the implementation of DSA using a Licensed Shared Access Approach (LSA) in the bands already licensed to MNOs. Sentech submitted that the inclusion of the entire band would cause challenges in regulatory, technical, spectrum availability,

¹¹ See for example the report of the Electronic Communications Committee Report 358: In-band and Adjacent Bands Sharing Studies to Assess the Feasibility of the Shared Use of the 3.8-4.2GHz Frequency Band by Terrestrial Wireless Broadband Low/Medium Power (WBB LMP) Systems Providing Local-Area Network Connectivity, CEPT Electronic Communications Committee, approved on 28 June 2024 and corrected on 7 March 2025 (the "ECC Report")

interference management, pricing and coexistence with legacy systems.

- 78.5 Telkom was concerned that ICASA must ensure that harmful interference to Lower 6 GHz PTP links is not caused.
- 78.6 Huawei noted that in practice, the sharing scheme will need to calculate the separation distance to avoid interference from mobile stations into satellite receivers. (As we explain elsewhere, the separation distance that is necessary to prevent harmful interference makes DSA unfeasible in urban areas).
- 79 Severe harmful interference inevitably arises when terrestrial services and FSS operate in the same spectrum band / channel (whether dynamically assigned or not). The likelihood of this harmful interference is an accepted fact, well documented both locally and internationally. As we show later in this submission, a key element of international case studies that focus on spectrum for 5G mobile wireless or private networks in the Band is to recognise the importance and value to consumers of the current incumbents operating in the Band, and to ensure that there is no interference to the incumbent users when introducing new users in the Band. The manner in which this is achieved may differ between Europe and the USA, but this core intent remains the same.
- 80 As ICASA no doubt appreciates, to understand why interference occurs, it is pertinent to consider the differing power levels of the respective signals. The power flux density per MHz at receivers differs greatly between satellite and terrestrial transmitters, with the terrestrial signal nearly 500 000 times larger than the satellite signal. Satellite signals can therefore be easily obliterated by terrestrial operations.
- 81 ICASA explicitly recognised this risk in 2021 when it published a moratorium on further licensing of fixed wireless access ("FWA") in the 3.6-3.8Ghz band, stating that *"continued licensing of fixed wireless access in the band will exacerbate*

harmful interference experienced by primary services in the band".¹² (The primary services referred to in ICASA's notice include FSS/satellite downlinks). ICASA has therefore long been cognisant of the fact that FSS services cannot easily co-exist with terrestrial services including FWA, BFWA or IMT.

- 82 This risk is exacerbated in the DSA context. Sensing equipment designed for detecting terrestrial transmissions is incapable of detecting and protecting satellite services under a DSA framework.
- 83 ICASA's assertion that DSA principles may be implemented in other spectrum bands beyond TVWS spectrum¹³ demonstrates a misunderstanding of the fundamental differences that apply between terrestrial and satellite services. A DSA approach for terrestrial services as in the case of TVWS cannot be transposed into sharing scenarios between satellite services and terrestrial services without substantial technical revision and amendment.
- 84 MultiChoice relies heavily on the Band for our distribution services. MultiChoice uses the sub-band extensively for broadcast, backhaul of international and regional contribution feeds, distribution of feeds for MultiChoice's GOtv (DTT) network in numerous African countries, VSAT communication to GOtv network sites, and access to high-availability feeds for event-based broadcasts. We use C-band spectrum for receiving international channels that are broadcast on both Ku-band and on DTT services in the rest of Africa, in accordance with the frequency spectrum, ECS and ECNS licences issued by ICASA to Orbicom.
- 85 It is worth noting that unlike some other, more developed jurisdictions, South Africa has a much greater dependency on C-band for these activities. Interference in this sub-band would therefore have the potential to be extremely disruptive for operators like MultiChoice. After all 3.8-4.2GHz comprises the full

¹² Notice of Moratorium on Applications in respect of Radio Frequency Spectrum Assignments in Radio Frequency Bands Identified for Implementation of IMT Systems and the 3600 - 3800 MHz Radio Frequency Spectrum Band, published under Notice Number 47, Government Gazette Number 44167, 17 February 2021

¹³ Discussion Document on Dynamic Spectrum Access and Opportunistic Spectrum Management, published under Notice Number 48352, Government Gazette Number 3242, 31 March 2023 (the "Discussion Document")

remaining C-band. There is nowhere else, no adjacent band for FSS users like MultiChoice to migrate to, if our activities in this Band are disrupted.

86 We urge ICASA to contemplate what this might mean for MultiChoice as a broadcaster which operates across the African continent, feeding programme signals to entities in various countries, receiving and distributing channels from multiple locations around the world, transmitting live news and sport events, all via satellite. The potential for wide scale disruption to the satellite backbone of our business and consequent service disruption to the millions of households who watch our services is not something we can afford to take lightly.

87 In addition to MultiChoice, there are numerous other operators that use spectrum in the Band. For example, we understand that:

87.1 Sentech uses the Band for distribution of radio and television feeds to its national terrestrial network of broadcast sites.

87.2 Liquid Telecom uses the Band for VSAT and critical data communication.

87.3 Globecast uses the Band to assist with content contribution for broadcasters and high availability feeds for live events.

87.4 Similarly, Telemedia uses the Band for critical high availability broadcast and data feeds and special event feeds.

87.5 Air traffic navigation services use the Band for air traffic navigation facilities and to interconnect voice and data communication across SADC and Africa-wide.

87.6 The South African National Space Agency (SANSA) uses the Band for satellite telemetry and tracking, satellite launch support and satellite operator support.

87.7 The South African Radio Astronomy Observatory ("SARAO") uses the Band for the purposes of radio astronomy observations.¹⁴

In summary:

- 88 Existing services, including MultiChoice and many others, face significant risk, in the form of harmful interference, if DSA is implemented in the Band.
- 89 MultiChoice relies heavily on the Band for our distribution services using it for broadcast, backhaul of international and regional contribution feeds, distribution of feeds for MultiChoice's GOtv (DTT) network in numerous African countries, VSAT communication to GOtv network sites, and access to high-availability feeds for event-based broadcasts.
- 90 The risk of interference has been documented in various studies and reports, including by the ITU and regulators in other jurisdictions.
- 91 The significant risks to the activities of existing users in the Band must be adequately addressed by ICASA before it can take the Draft Regulations forward.

ICASA'S PROCESS TO DATE HAS COMPROMISED THE PROCESS AND ITS OUTCOMES

- 92 We respectfully submit that the process followed by ICASA to date has compromised its ability to address the risks to existing users in the Band. As is apparent from the description below, ICASA's process has been characterised by minimal substantive engagement by the regulator on the core issues and little opportunity for stakeholders to participate meaningfully or at all in debates and discussions.
- 93 The consultation process which ultimately resulted in the Draft Regulations, has been problematic and beset with flaws. Taken individually, each of these flaws is concerning, but when viewed together, the validity of the entire process may be called into question.

¹⁴ This is not an exhaustive list

94 In the paragraphs below, we record the numerous deficiencies in the process followed by ICASA.

ICASA did not make written submissions available and did not conduct hearings

95 Inexplicably, ICASA did not publish the written submissions made on its original 2023 Discussion Document (notwithstanding its undertaking to do so). ICASA only published short extracts in its Position Paper, some of which contradict the position adopted by ICASA.

96 Nor did ICASA conduct public hearings, despite ICASA's recognition that there were "conflicting views" and "minority" support for ICASA's proposals.¹⁵ The Position Paper glibly states that "*None of the acknowledged stakeholders indicated their intention or desire to make oral representations, as a result the Authority did not hold public hearings*".¹⁶ This is plainly incorrect. Orbicom explicitly stated twice in its written representations that it wished to make oral submissions.

97 Hearings would have given stakeholders an opportunity to ventilate and explain their concerns and would have undoubtedly enriched ICASA's understanding of the issues. The process was inevitably weakened by the absence of hearings.

In its Findings ICASA did not explain or provide any reasons for its decision to implement DSA in the 3.8-4.2GHz Band

98 The gaps in the Discussion Document process are apparent in the disappointing quality of the Position Paper. While the Position Paper summarises some of the concerns raised by stakeholders, ICASA did not engage with those concerns, explain why it believes those concerns are not valid or how it believes the challenges identified will be overcome. For instance, on the most critical and

¹⁵ Paras 4.1 and 4.2 of the Position Paper

¹⁶ Pg 10 of the Position Paper

controversial issue which ICASA was deciding on, ICASA merely stated that:

*"The position of the Authority is to implement the DSA framework in the sub-bands 3.8-4.2 GHZ..."*¹⁷

- 99 ICASA did not give any explanation for why it arrived at this decision and why it believes the problems identified by stakeholders will not arise, only alluding vaguely to its mandate, prior experience and international best practice (which is in any event mischaracterised.) Nor does the Position Paper provide any indication that ICASA applied its mind to the suggestion made in some submissions that DSA should instead be implemented in the licensed mobile frequency bands.
- 100 ICASA fails to explain how using a band that is suited for local wireless connectivity with very small cells will be suitable for providing generic *"broadband access to the rural, underserved, remote communities"*¹⁸. Large coverage over sparsely populated areas would be far more economically achieved via TVWS spectrum (470-694 MHz) than the 3.8-4.2GHz band. In general, lower frequency signal can travel further and penetrate obstacles better, while higher frequency signals have shorter range and are more easily blocked by obstacles.
- 101 As we mentioned earlier, studies on shared spectrum access in 3.8-4.2GHz Band conclude that the protection of FS and FSS in all scenarios cannot be guaranteed and that careful planning is needed to ensure their protection.
- 102 ICASA does not deal with these issues in its Findings. Instead, ICASA seems to put a lot of stock in its apparent finding of *"clear support from a majority of respondents...to implement the DSA regulatory framework within the S and C spectrum bands"*.¹⁹ Whether or not there was majority support (we are not sure there was), regulation-making is not a popularity contest. ICASA's duty is not to act in the interests of "the majority" but to act in the public interest after having

¹⁷ Para 4.3.1 of the Position Paper

¹⁸ Draft Reg. 2(a)

¹⁹ Para 4.2.1 of the Position Paper

carefully considered the evidence. There is little in the Position Paper or subsequent Draft Regulations to suggest that ICASA did so.

103 ICASA concedes that "*there were wide-ranging opinions from respondents on which specific sub-bands*" should be used for DSA.²⁰ These wide-ranging opinions are apparent from ICASA's summary of submissions in the Position Paper. In examining ICASA's summary, it is difficult to find any respondents who actually advocated for the 3.8 – 4.2 sub-band specifically. On the contrary, many submissions opposed it.

104 Ultimately, the gaps in the Position Paper together with the absence of hearings, cast doubt on the reliability of ICASA's process and the rationality of the outcomes reached. Those concerns are amplified by ICASA's actions after the publication of the Position Paper.

ICASA's gathering of technical information in the "implementation phase" was rushed and flawed

105 After the publication of ICASA's Position Paper, on 16 May 2024 MultiChoice wrote a detailed letter to ICASA, alerting it to the procedural and substantive concerns and asking ICASA to pause and urgently address the critical issues raised before proceeding any further. We noted that pertinent information had not been considered and we requested a meeting with ICASA.

106 ICASA responded to MultiChoice six weeks later, on 28 June 2024. In the response, ICASA did not address any of the concerns raised by MultiChoice. It stated that the inquiry was closed and that it was proceeding with the implementation of DSA, inviting MultiChoice to raise any concerns during the next phase.

107 Prior to this response, ICASA had in any event already on 21 June 2024, gazetted a notice explaining the next steps in the implementation phase and

²⁰ Para 4.2.2 of the Position Paper

inviting stakeholders to submit technical information on stations operating in the relevant bands, within 8 business days (i.e. by 3 July 2024).

108 It was in response to this notice that MultiChoice wrote to ICASA on 26 June 2024, once again recording its concerns and pointing out that it was alarming that ICASA was only then calling for relevant technical information. In our view, the information should have been requested and considered during the Discussion Paper phase of the inquiry, some 15 months prior. It was also concerning to us that ICASA was giving such a short time to provide the information. We requested until 31 July 2024 to allow us sufficient time to collate the information, a request which ICASA only responded to after the 3 July deadline had passed.

109 As no response from ICASA had been received by the due date, MultiChoice scrambled to pull the relevant information together which we submitted to ICASA on 3 July 2024. In the covering letter we pointed out that unfortunately the template provided by ICASA was deficient in numerous respects, suggesting that ICASA was not fully cognisant of the relevant technical factors to consider for FSS services. We pointed out that:

109.1 The template provided only one column for geographical coordinates rather than one for latitude and one for longitude and furthermore it seemed to suggest that both transmit and receive systems are located at one point. In FSS the uplink and downlink (transmit and receive) system can be in different countries. In addition, multiple different receive systems may be in operation across a satellite hub.

109.2 The template seemed ignorant of the relevance and significance of considering the satellite information for FSS services (as per the primary allocation of the Band). MultiChoice therefore added additional columns to capture, among others, the orbital slot, satellite power and look angle that are critical to consider in any sharing and coexistence study.

109.3 The template assumed a point-to-point system configuration whilst the FSS services as deployed for broadcasting are based on various

reception scenarios and reception at different receive locations with different receive characteristics receiving signals from the same satellite.

- 109.4 The template was deficient in terms of capturing the system noise and performance parameters required to assess the FSS facilities' performance and the nature of a complex receive system.
- 110 In addition to providing the requested information, MultiChoice also hastily undertook a mapping exercise of C-Band FSS locations and separation distances for co-channel operation, based on the information we were able to source by the deadline.
- 111 The data submitted by MultiChoice showed unequivocally that DSA will have severe implementation challenges due to the prolific use of TVRO sites in South Africa and that it would likely cause severe harmful interference to existing systems operating in the Band. No response to our submission was received.
- 112 On 4 July 2024, we received a response to our 26 June 2024 letter, stating that since an insufficient number of responses had been received, ICASA would publish another notice by 10 July 2024 calling for technical information. (The new notice was published on 12 July 2024 and, accordingly, on 26 July 2024 MultiChoice supplemented its previous response with further information). It remains unclear how many parties eventually submitted the relevant technical information requested, as ICASA has not made this available to stakeholders.

ICASA back-tracked on the assurances it gave to MultiChoice that stakeholders would be involved in its trials and simulations

- 113 On 15 July 2024, ICASA invited MultiChoice to attend an hour long one on one virtual meeting "*for discussions to address foreseen issues and clarification on matters at hand*". ICASA explained in its invitation that its next steps would include simulations and field trials in order to protect existing systems operating

in the Band, to test whether co-existence is possible and to determine the technical parameters to protect existing users.²¹

114 In its response dated 17 July 2024, MultiChoice welcomed the opportunity to meet with ICASA and commended ICASA's initiative to protect existing systems from any interference. We also asked various questions in relation to the process that ICASA would follow.

115 Those questions were not addressed by ICASA until the one on one meeting on 25 July 2024 during which ICASA gave the important and very welcome assurance that it would ensure that no interference is caused to existing users in the Band. ICASA also made the following undertakings during that meeting:

115.1 It would consult relevant stakeholders at all relevant stages, including in respect of the simulations and trials, and before prescribing regulations; and

115.2 It would make available to MultiChoice (and presumably other stakeholders) possible scenarios, parameters and technical regulations "*early on in the process*".

116 We recorded the above undertakings in a letter to ICASA dated 2 August 2024, which ICASA did not dispute. We further stated in our letter that we looked forward to participating in all the forthcoming steps which ICASA had promised. In our minds it was crucial that there be prior agreement amongst stakeholders and ICASA on what was to be tested, in order to allow for robust and reliable results. Relieved that ICASA was seemingly of the same mind, we accordingly waited for ICASA's next steps.

117 Over the next few months we heard nothing from ICASA. We wrote again to ICASA's DSA committee on 16 September 2024 stating that we hoped to hear soon about our participation in the DSA simulations and trials, but once again we

²¹ Letter from ICASA to MultiChoice, 15 July 2024

received no reply. Given ICASA's assurances and the lack of any updates on the matter, we presumed there must be delays on ICASA's side.

- 118 At the end of the day the collaborative and consultative process which ICASA had promised never materialised. The next we heard from ICASA was when it gazetted the Draft Regulations on 28 March 2025. The Draft Regulations included a summary of the results of simulations developed and conducted without any input by or inclusion of stakeholders as ICASA had promised.

ICASA's simulations are inadequate

- 119 As we show below and in **Annexures A and B**, based on the limited information provided by ICASA in the summary annexed to the Draft Regulations, the simulations which ICASA eventually conducted - without stakeholder input or involvement - are wholly insufficient as a basis for regulation-making and are not a reliable foundation for DSA in the Band.
- 120 ICASA's simulations are unduly narrow and it is therefore difficult to see how any meaningful conclusions can be reached from them. They certainly do not satisfy us that DSA in the Band won't cause harmful interference.
- 121 In stark contrast, the work done by Ofcom and CEPT on the same subject, which contain a comprehensive set of scenarios and varying input parameters, provide a clear and comprehensive picture of all the risks. Considering only three FSS receive sites, at a significant distance from the simulated BWA transmit site, as ICASA has done, is wholly insufficient for drawing any reliable conclusions.
- 122 It is also alarming that ICASA's simulation results are inconsistent with studies done by CEPT and, moreover, that ICASA does not seem concerned by this. There should be a consistent outcome between such studies. ICASA fails to explain why the outcomes differ so starkly.
- 123 It would be highly irresponsible for these narrow simulations to be used as a basis for moving forward.

124 For instance:

- 124.1 The Draft Regulations speak to an operator potentially rolling out a network using so-called "innovation spectrum", but this is not covered in the simulations.
- 124.2 The draft regulation also speak to urban use, which would naturally require a denser network, but the simulations presented do not address this use case.
- 124.3 The ICASA simulations incorrectly create the impression that DSA would be feasible in urban areas and in particular the greater area around the modelled CSIR point. But ICASA failed to consider the C-Band FSS receive data submitted to it by existing operators and failed to study or present the real-life interference that will be caused by BWA transmissions.

125 Given the gravity of the risks, MultiChoice commissioned Radio Telecommunication Services (Pty) Ltd ("RTS") as an independent technical expert to conduct a study of ICASA's simulations and to perform link prediction for the various sites, and to prepare a technical report. The "RTS Report" is attached as **Annexure B**.²² The RTS Report provides the detail of the FSPL, clutter losses and the resulting interference power levels derived for the respective FSS receive locations. These differ significantly from the ICASA values and confirm the underestimation of the interference impact in the ICASA simulation. Furthermore, these illustrate the severity of the interference impact on the FSS receive points not considered in ICASA's simulations.

126 We list below just a few of the additional difficulties we have with the simulations. Many more are catalogued in our **Annexure A: Comments on ICASA's Simulations**.

- 126.1 On the channel bandwidth used, it should be 20MHz for the scenario where there is more than 1 base station using two channels. It is good

²² PtP Study Technical Report - Rev AA1, Radio Telecommunication Services (Pty) Ltd, prepared for MultiChoice Support Services, 23 May 2025 (the "RTS Report")

practice to take into account the worst possible scenario to determine feasibility. The energy from two base stations will have a greater impact. In addition, there is no cell configuration specified and simulated.

- 126.2 It is unclear how the noise floor figure was calculated as the noise temperature used is not specified. This is also the case for the specified noise figure of 5dB.
 - 126.3 It is unclear what percentage of activity is assigned to the interfering base station. Is it active 50% or 100% of the time? This has an impact on the allowable interference threshold of the FSS earth station and ultimately impacts the protection criterion of I/N.
 - 126.4 Only long term protection is evaluated in the simulations and no indication is given for short term protection that normally has a much more severe impact.
 - 126.5 The simulations and validation parameters and terrain models contain significant errors that skew the results presented.
- 127 The conclusions drawn from the simulations are of no value unless these errors are fixed.
- 128 We elaborate on these in **Annexure A** and enclose the RTS Report as **Annexure B** for ICASA's reference.
- 129 Overall, ICASA's approach to the simulations is lacking, mirroring the procedural problems which have characterised the DSA process from the start.
- 130 We believe the shortcomings might well have been avoided if ICASA had included MultiChoice and other stakeholders in the prior planning and during implementation. It is also alarming that it is on the basis of the flawed results, that ICASA has proceeded to develop its Draft Regulations which propose sharing of the Band.

131 ICASA is apparently of the view that the simulations conducted prove that interference is not a concern in the Band. MultiChoice strongly differs with that view.

In summary:

132 ICASA's consultation process, which ultimately resulted in the Draft Regulations, has been problematic and flawed.

133 ICASA did not make written submissions on the Discussion Paper available and did not conduct hearings, even though requests for a hearing were made.

134 Even though a number of parties objected to or raised questions about, the implementation of DSA in this Band, ICASA did not engage with these arguments, and its Position Paper did not explain the basis for rejecting these arguments or provide any reasons for its decision to forge ahead with implementation of DSA in the Band.

135 ICASA back tracked on the assurances it gave to MultiChoice that it (and presumably other stakeholders) would be involved in its trials and simulations, prior to publishing Draft Regulations. MultiChoice was not included in the simulations, despite its request and commitment to participate.

136 The simulations which ICASA eventually conducted without our input or involvement, are flawed and inadequate and no reliable conclusions can be reached from them.

137 The RTS study commissioned by MultiChoice confirms the underestimation of the interference impact in the ICASA simulation and illustrates the severity of the interference impact on the FSS receive points not considered by ICASA in the simulations.

138 The simulations certainly do not satisfy us that DSA in the Band won't cause harmful interference. They do not provide a sound basis for ICASA to proceed to develop regulations.

139 We now turn to the many fundamental difficulties in the Draft Regulations themselves.

FUNDAMENTAL DEFICIENCIES IN THE DRAFT REGULATIONS

140 Several fundamental problems with the Draft Regulations render them fatally flawed and make them vulnerable to legal challenge.

141 We address these difficulties in this section.

(1) Draft Regulations do not support technological neutrality or planning for future spectrum needs

142 One of the objects of the ECA is to create a technologically neutral licensing framework.²³ However, the Draft Regulations create a technology-specific regulatory framework which appears to reserve spectrum for specific devices / technology only and inhibits the growth of existing users in the Band, without taking into account the growth of existing satellite operations.

142.1 First, ICASA has proposed defining "*Innovation Spectrum (IS)*" as "*the unused radiofrequencies (RF) within the 3800 MHz to 4200MHz, and 5925 MHz to 6425 MHz sub-bands*". As a result, all of the currently unused frequencies in these sub-bands are proposed to be designated as Innovation Spectrum, access to which will only be granted in terms of the DSA Regulations. Access to the Innovation Spectrum will be granted utilising the dynamic spectrum assignment and opportunistic management approach.²⁴ This effectively removes the room for incumbent users to grow in the Band, or for new users to use the Band other than utilising the DSA and opportunistic management approach. Designating all unused spectrum in the designated bands as innovation spectrum would unfairly shut other users out from access to this spectrum and prevent them from growing their services going forward.

²³ s2(a) of the ECA

²⁴ Para 7 of ICASA's Notice, on pg 4 of the gazette

No provision has been made to cater for the growth of existing services or to plan for their future spectrum needs in the Band.

- 142.2 Second, the Draft Regulations restrict the types of devices which may be used in relation to the Innovation Spectrum. For example, a client Innovation Spectrum Device must meet the requirements in draft Reg. 5, including the requirement that a client Innovation Spectrum Device must be "*able to transmit and receive only when under the direction of a Master device, and only within the ISFR1 and ISFR2 under specific OP limitations*".²⁵ We do not know whether such a device in fact exists. Indeed, it is difficult to make this assessment in the absence of clear operational standards, which the Draft Regulations lack.

(2) Impermissible delegation to the USSP and insufficient information about the USSP designation

143 The Draft Regulations suffer from two fundamental flaws in respect of the USSP.

- 143.1 First, the Draft Regulations contain insufficient information about the proposed USSP framework.
- 143.2 Second, the Draft Regulations seek to effectively outsource essential functions which fall within ICASA's domain. This is an impermissible and unlawful delegation of ICASA's powers, functions and duties which is susceptible to legal challenge.

144 We address these two fundamental flaws below. Prior to doing so, we reflect on the proposed role of the USSP.

Proposed role of the USSP

145 The USSP is defined as meaning "*an entity delegated or designated by the Authority to provide USS services*".²⁶ (Our emphasis)

²⁵ Draft Reg. 5(2)(c)

²⁶ Draft Reg. 1

146 "USS services" is defined as follows:

"USS services' include the registration of primary users, IS network operators, the registration of ISDs, and the provision of operational parameters in response to spectrum requests from ISDs".²⁷

147 The USS is "a database system operated by an entity that has been **authorized by the Authority to calculate and generate Operational Parameters** for ISDs..."²⁸

148 The proposed USSP and USS are central to the Draft Regulations. Amongst other things:

148.1 A Network Operator seeking to roll-out a network utilising IS must submit an application to be registered with the USSP²⁹ and pay USS access fees to the USSP³⁰. The USSP shall provide a secure online form on the portal to facilitate registration of new applicants.³¹

148.2 During the application stage, a Network Operator must submit the prescribed details on the online form on the USSP portal, including the Network Operator's contact details, licences, company registration certificate, type approval details of the specific ISD model to be used for network deployment, radio access technology of the ISD to be deployed, geographical areas with location coordinates indicating where the IS-BTS shall be deployed.

148.3 The USSP must impose reasonable and non-discriminatory access fees on Network Operators for the use of USS services, which a Network Operator is obliged to pay to the USSP.³²

148.4 Upon receipt of the application, the USSP must authenticate the model of the ISDs, verify the information submitted by the applicant, register

²⁷ Draft Reg. 1

²⁸ Definition of "Unified Spectrum Switch (USS)" in draft Reg. 1

²⁹ Draft Reg. 6(1)

³⁰ Draft Reg. 6(3)(k)

³¹ Draft Reg. 6(2)

³² Draft Reg. 6(3) and 21

the applicant and notify it of the application outcome, and create an account for the applicant on the USSP portal.³³

- 148.5 The USSP must inform the applicant of the preliminary availability of the requested spectrum in the specified geographical area(s) of interest prior to network rollout by issuing a digital spectrum availability certificate.³⁴
- 148.6 After the Network Operator has paid ICASA the spectrum licence fees, the USSP must activate the applicant's account on the USS platform enabling registration of operator ISDs, commencement of network rollout and ISDs to access the USS to request for Operational Parameters.³⁵
- 148.7 Importantly, the USSP must calculate and assign operational parameters (OPs) to ISDs to ensure a low probability of harmful interference to incumbent users in compliance with the AGA Act, the National Radio Frequency Plan, the applicable ITU recommendations and applicable intergovernmental bilateral cross-border harmonisation agreements.³⁶
- 148.8 Upon identification of harmful interference, the USSP must suspend spectrum assignments to all ISDs associated with the operator found to be causing the interference.³⁷ An ISD found to be causing the harmful interference must cease transmission after receiving an instruction from the USS.³⁸

³³ Draft Reg. 6(4)

³⁴ Draft Reg. 6(4)(c)

³⁵ Draft Reg. 6(6)

³⁶ Draft Reg. 11(4). When calculating the OPs, the USS must comply with the technical requirements in draft Reg. 11.

³⁷ Draft Reg. 12(2)

³⁸ Draft Reg. 12(3)

- 148.9 The USSP must carry out the functions in draft Reg. 13, including to:
- 148.9.1 maintain a database for containing information about incumbent licensees requiring protection;
 - 148.9.2 establish a process for registering new IS network operators;
 - 148.9.3 establish a process for synchronising and acquiring necessary technical information from ICASA's systems at least once a week, including updates on newly licensed facilities or changes to existing licensed facilities;
 - 148.9.4 implement propagation algorithms and interference parameters prescribed by ICASA;
 - 148.9.5 establish protocols and procedures to secure communications and interactions between the USS, ISDs and DbPs; and
 - 148.9.6 many other functions.

149 As is clear from the summary above, the USSP and USS play an integral role in the implementation of DSA.

Insufficient information about the process and requirements for the proposed USSP designation / delegation

150 Notwithstanding the core role to be played by the USSP and the USS, the Draft Regulations provide insufficient information about the process and requirements for the appointment, designation and delegation of ICASA's functions to the USSP.

151 As indicated above, the USSP is defined as meaning "*an entity **delegated or designated by the Authority to provide USS services***".³⁹ (Our emphasis)

³⁹ Draft Reg. 1

- 152 The Draft Regulations provide no indication of whether this is a delegation or designation (or another form of appointment). Draft Reg. 13(1) simply provides that the "*Authority shall designate a USSP to provide USS services*". (Our emphasis)
- 153 It is both striking and alarming that, despite the extensive role to be played by the proposed USSP, it is not clear how the USSP will be identified and given the responsibilities of managing the spectrum switch. The Draft Regulations are virtually silent on matters such as the following:
- 153.1 Who or what is the USSP? Is it a natural or juristic person? Does ICASA have a specific individual or entity in mind? Will there be one or multiple USSPs for the country?
- 153.2 How and by whom will the USSP be identified and appointed, and following what process?
- 153.3 What are the criteria for the appointment of the USSP?
- 153.4 Are any qualifications, knowledge, skills or experience pre-requisites for the appointment of the USSP? (For example, the Draft Regulations do not contain any provisions similar to s5(1A), 5(3), 5(4), 6, 6A, 7, 8, 9, 10, 11, 11A, 11B, 12 of the ICASA Act, all of which have been legislated to ensure the independence and integrity of ICASA and its administrative action.
- 153.5 For example, s12 of the ICASA Act deals with conflicting interests of ICASA councillors. No provision is made for conflicts of interest in respect of the USSP. How will ICASA ensure that the USSP makes decisions in the public interest, rather than its own interests? How will conflicts of interests be dealt with? May the USSP be the custodian of the technology contemplated in the Draft Regulations? It cannot reasonably be expected that any 3rd party could operate with the necessary independence required by ICASA in managing the national spectrum resource. The neutrality, objectivity and independence required could not be procured or warranted to the same extent as is

the case for a Chapter 9 institution as ICASA which is required by the Constitution and its empowering statutes to be independent.

- 153.6 What are the terms and conditions of the appointment of the USSP?
 - 153.7 Who will own the proposed database, communication protocol, communication hardware, etc. contemplated in the Draft Regulations?
 - 153.8 What obligations will the USSP have in the event that issues and/or disputes arise between DSA operators and incumbent users in the Band (such as FSS operators)?
 - 153.9 On what basis will information be exchanged between ICASA and the USSP? How will confidentiality be protected?
- 154 The Draft Regulations are impermissibly vague in this regard and are vulnerable to a legal challenge that they are void for vagueness.

Impermissible and unlawful delegation

- 155 Leaving aside for the moment the difficulties concerning the process and requirements for the designation of the USSP, the second fundamental flaw is the notion that ICASA can delegate the above mentioned functions to the USSP.
- 156 As appears from the description of the USSP's functions in paragraph 147 above, the effective outsourcing of key functions to the USSP as proposed in the Draft Regulations would give the USSP control over key spectrum management functions beyond the scope permitted by the ECA and the ICASA Act.
- 157 As mentioned above, s30(1) of the ECA confers on ICASA the power, function and duty to control, plan, administer and manage the use and licensing of the Radio Frequency Spectrum. Moreover, it is the responsibility of ICASA to prevent, manage and resolve interference.
- 158 Absent a lawful delegation, it is not permissible for any person or body which is not ICASA to perform the functions and duties and to exercise the powers bestowed upon ICASA in terms of the ECA and the ICASA Act.

- 159 ICASA was established by s3 of the ICASA Act as the independent regulator, which "*must exercise the powers and perform the duties conferred and imposed upon it by*" the ECA and the ICASA Act.
- 160 It is ICASA which is responsible for the control, management, administration, etc. of the radio frequency spectrum.⁴⁰ This is a function to be performed by ICASA, not outsourced wholesale to an amorphous USSP.
- 161 Moreover, to the extent that the Draft Regulations contemplate a delegation to the USSP (which is not clear from the Draft Regulations), any such delegation would be an impermissible delegation of ICASA's powers.
- 162 The manner and extent to which ICASA may delegate any of its powers functions or duties is delineated in s4 of the ICASA Act.
- 163 ICASA may, in writing, subject to the provisions of the Public Finance Management Act, delegate any of its powers, functions or duties in terms of the ICASA Act or the underlying statutes⁴¹ only to:
- 163.1 any councillor;
 - 163.2 any committee of the Council established in terms of s17 of the ICASA Act;⁴² or
 - 163.3 the chief executive officer of ICASA.⁴³
- 164 The Draft Regulations do not suggest that the USSP would be any of these three possible candidates for delegation.

⁴⁰ The ICASA Act, the EC Act and the Broadcasting Act comprise the legislative framework that give effect to s192 of the Constitution (*Radio Pretoria v Chairperson, Independent Communications Authority of South Africa and Another* 2005 (4) SA 319 (CC), para 20) ICASA was established by s3 of the ICASA Act as the independent broadcasting authority, which "*must exercise the powers and perform the duties conferred and imposed upon it by*" the ICASA Act, the EC Act and the Broadcasting Act (s4(1)(a) of the ICASA Act)

⁴¹ "Underlying statutes" is defined in s1 of the ICASA Act as "the Broadcasting Act, Postal Services Act and Electronic Communications Act"

⁴² s17 of the ICASA Act contains detailed provisions regarding standing and special committees which may be established by the Council of ICASA to assist it in the effective exercise and performance of its powers and duties.

⁴³ s4(4)(a) of the ICASA Act. ICASA may not delegate the power to make regulations.

- 165 Even if it was, the effective outsourcing of the USS functions to the USSP in terms of the Draft Regulations does not meet the requirements for a lawful delegation.
- 166 s4(4) of the ICASA Act sets out requirements for a lawful delegation. Significantly, notwithstanding the provisions of s4(4), the Council of ICASA must exercise general control over the exercise of the powers and the performance of the duties of ICASA in terms of the ICASA Act and the underlying statutes.⁴⁴
- 167 The proposed delegation to the USSP is not a permissible delegation in terms of s4 of the ICASA Act.
- 168 In addition, the administrative action of an administrator must be authorised by an empowering provision and the administrator must act under a delegation of power which was authorised by the empowering provision.⁴⁵
- 169 Finally, we note that ICASA may appoint as many experts as may be necessary to assist ICASA in the performance of its functions.⁴⁶ But the appointment of an expert is not the same as a delegation. The ICASA Act permits ICASA to appoint experts to assist it in the performance of its functions, such as, for example, to conduct research or to provide advice. But this does not allow ICASA to hand over the function entirely to another person. The expert must provide an input to ICASA to assist ICASA in exercising its statutory powers and performing its functions and duties.
- 170 The Draft Regulations effectively propose the large-scale outsourcing of core functions. The proposed wide-ranging functions of the USSP include the registration of primary users, IS network operators, the registration of ISDs, and the provision of operational parameters in response to spectrum requests from ISDs, as well as imposing fees, managing the availability of the requested spectrum, activating the applicant's account on the USS platform, and enabling commencement of network rollout, amongst others. This large-scale

⁴⁴ s4(4)(h) of the ICASA Act

⁴⁵ s6(2)(a) of the Promotion of Administrative Justice Act, 2000 ("PAJA")

⁴⁶ s14A of the ICASA Act

"outsourcing" is a different issue entirely to the appointment of an expert to assist ICASA and exceeds the ambit of s14A of the ICASA Act.

- 171 The "outsourcing" of functions to the USSP proposed in the Draft Regulations far exceeds the extent to which ICASA is permitted to (i) delegate its powers, functions and duties and/or (ii) to obtain expert assistance in the performance of its functions in terms of s4(4)(a) and s14A of the ICASA Act.

(3) Insufficient transparency and accountability mechanisms built into the Draft Regulations

- 172 A further fundamental concern relates to transparency and accountability in respect of the DSA framework.
- 173 The making of regulations constitutes administrative action. PAJA was enacted to, inter alia, create a culture of accountability, openness and transparency in the public administration and in the exercise of a public power and the performance of a public function.
- 174 However, the Draft Regulations lack the necessary accountability, openness and transparency.
- 175 First, interested parties have had minimal insight into the considerations taken into account by ICASA in preparing the Draft Regulations and conducting the simulations. Contrary to ICASA's assurances, ICASA did not take industry into its confidence regarding the input assumptions for the simulations, and ICASA has provided limited information in this regard. We refer to the detailed record of the flawed consultation process conducted by ICASA, set out above.
- 176 As explained in this submission, numerous aspects of the draft DSA framework are hazy, including regarding the designation of the USSP.
- 177 Moreover, it does not appear that the USSP will be accountable under the ECA, ICASA Act and/or PAJA.

178 There is insufficient restraint on the actions of the USSP and the USS. For example:

- 178.1 The USSP must "impose" reasonable and non-discriminatory access fees on Network Operators for the use of USS services, which a Network Operator is obliged to pay the USSP.⁴⁷ There is no requirement for such fees to be determined, following a consultation process or other due process, in terms of regulations made in terms of s4 of the ECA. The USSP must simply "impose" fees. The only requirement is that the fees must be reasonable and non-discriminatory.
- 178.2 Nor is there sufficient guidance on the determination by the USS of the OPs,⁴⁸ channels and power levels.⁴⁹ The Draft Regulations do not stipulate a procedure to indicate how the power levels will be determined, nor any process for incumbent users to gain access to all relevant information.
- 178.3 If the USS indicates that a channel is no longer available at the current operating level, operation on a channel must cease immediately or power must be reduced to a "permissible" level.⁵⁰ An ISD must reduce its transmit power levels per channel below the thresholds specified in draft Reg. 10(2) and (3), "*if so required by the USS*",⁵¹ but there are no clear protection criteria stipulated. With no clear protection criteria stipulated, users may find that their network deployment is not feasible with lower transmit powers. Transparency and access to information is therefore critical. But, notwithstanding the powers conferred on the USS in this regard, the Draft Regulations make no provision for due process, transparency or accountability.

⁴⁷ Draft Reg. 6(3) and 21

⁴⁸ Draft Reg. 15(5)

⁴⁹ Draft Reg. 10 read with 11(15)

⁵⁰ Draft Reg. 11(16)

⁵¹ Draft Reg. 10(4)

- 178.4 As regards Draft Reg. 6, will the location of the authorised network of a "Network Operator" be readily available to view?
- 179 Nor have basic procedural and operational requirements been specified to help an operator determine if it could launch a service in the Band. For example, what terrestrial technologies can the operator deploy? What minimum protection criteria should be ensured? Draft Reg. 5 addresses technical operational details of an unknown technology and in itself is not technology neutral. No published standard has been referenced in this regard. Various parameters have yet to be determined by the USSP or by the USS.⁵²
- 180 Who may revoke an innovation spectrum licence in terms of draft Reg. 22, and in terms of what provisions and due process?
- 181 Likewise, when a "Network Operator" registers on the USSP portal it must indicate the geographical areas with location coordinates indicating where the IS-BTS will be deployed.⁵³ Who will decide on these geographical areas?
- 182 In similar vein, how will the minimum licence area (MinLA) for which the USS may assign available channels in ISFR1⁵⁴ be defined, and by whom? For example, urban use would require a denser network to connect consumers, in effect increasing its footprint. The simulations presented by ICASA do not address this use case. The definition of MinLA is not clear as to how it is going to be calculated, apart from the proposal that ISFR 1 assignment shall consist of a single Master device. Depending on the deployment and power issues, these minimum areas are prone to differ and may not be consistent with the principle of keeping with prescribed areas. Further clarification is required on the requirements and operation of how MinLA will be calculated and determined.
- 183 Similarly, draft Reg. 10 proposes maximum permitted transmit power levels of ISDs, but no procedure is stipulated to determine how power levels will be

⁵² See, for example, draft Reg. 11(4) and 11(5).

⁵³ Draft Reg. 6(3)(j)

⁵⁴ Draft Reg. 9(1)

determined, or for prospective operators to gain access to all relevant information.

184 In addition, certain functions are outsourced to the CSIR. All communications between the USS and listed devices must comply with the communication protocol for accessing the USS (CPAUSS), namely the machine-to-machine communication standard defined by the CSIR, designed for ISDs to automatically access USS services.⁵⁵

185 The Draft Regulations are shrouded in uncertainty and lack the necessary openness, transparency and accountability mechanisms.

(4) Licensing process is unclear

186 A further significant concern relates to the licensing framework for DSA, and how it will fit in to the spectrum and service licensing framework in the ECA. For example:

186.1 The Draft Regulations refer to a "Network Operator".⁵⁶ It is not apparent why the Draft Regulations introduce the concept of a "Network Operator" to mean a holder of an electronic communications network service licence. The "Network Operator" concept is foreign to the ECA.

186.2 There is general confusion and/or duplication between spectrum licensing (and associated fees) by ICASA, and registration (and associated fees) with the USSP. "Licence" is defined as meaning a "radio frequency spectrum licence", but a Network Operator seeking to rollout a network using IS must submit an application to be registered with the USSP⁵⁷.

186.3 To make matters worse, draft Reg. 18 refers to an "Innovation Spectrum Licence" and deals with its validity and renewal. Is this a spectrum licence or another licence? If it is a spectrum licence, is it not

⁵⁵ Draft Reg. 7(1) read with the definition of CPAUSS in draft Reg. 1

⁵⁶ Definition of "Network Operator" in draft Reg. 1 read with Reg 6 and Reg. 4(4)

⁵⁷ Draft Reg. 6(1)

already covered by the Radio Frequency Spectrum Regulations, 2015, prescribed by ICASA? If not, why not? Who will issue and renew this "IS spectrum licence"?

186.4 The definition of a "professional installer" is also vague. "Professional Installer" is defined in draft Reg. 1 as meaning "*any competent person or entity registered with the professional body or have a relevant technical qualification from an accredited technical education institution to install and commission radio equipment*". For example: In what circumstances will a person or entity be considered "competent"? Who will determine this and in terms of what criteria? With which "professional body" must they be registered, qualified or accredited? Who will decide these matters, how, when and following what process?

187 These licensing and registration provisions are unclear and appear to be out of line with the ECA and the existing Radio Frequency Spectrum Regulations.

(5) Subjecting primary users to interference unless they have registered is unfair and out of step with normal practice

188 Another concern in the Draft Regulations relates to the requirement for primary users to be registered in order to be protected.

189 It is apparent that the Draft Regulations make the protection of a primary user from harmful interference conditional upon registration with the Authority.

190 Draft Regulation 11(1) which deals with "Measures to Prevent Harmful Interference" provides as follows:

"Any incumbent user operating in the IS seeking protection from harmful interference must register with the Authority."

191 Draft Regulation 1 furthermore defines "Registered Incumbents" as meaning -

"Fixed Satellite Services (FSS) and Fixed Service (FS) operators within the 3800–4200 MHz and 5925–6425 MHz sub-bands whose technical details are registered with the Authority to ensure protection from potential harmful interference caused by secondary users". (Our emphasis)

192 An affected incumbent may not even report interference to the Authority if that user has not registered in accordance with Draft Regulation 12. Draft Regulation 12(1) provides:

"Affected incumbent users operating in the IS must report any incident of harmful interference on their network to the Authority for further investigation. Such report must be submitted only after confirming that the conditions outlined under Regulation 11(1) and (2) have been met." (Our emphasis)

193 Of particular concern is Draft Regulation 12(6), which places the sole responsibility to resolve interference incidents on the primary user if the user has not registered with ICASA in terms of Draft Regulation 11(1) and (s). Draft Regulation 12(6) provides:

"The incumbent user shall bear sole responsibility for resolving interference incidents if the conditions specified under regulation 11(1) and (2) have not been met."

194 The result is that any incumbent or existing user of the Band would not enjoy protection from harmful interference if they do not register with ICASA. Not only would the primary user not enjoy protection, it would bear the sole responsibility for resolving interference.

195 While registration may well be necessary and useful for the creation of a reliable and transparent database to enable DSA to be implemented properly, it is highly irregular for it to be used as a pre-requisite for protection from interference, and there are several issues with such a provision which render the Draft Regulations fatally flawed.

196 This draft regulation is not aligned with international obligations and the ECA.

197 The primary or secondary status of a service is determined by an entry into the Table of Frequency Allocations or footnote in the Radio Regulations and acceded and aligned to by ICASA in compiling the National Radio Frequency Plan. It is not contingent on registration, or, indeed, licensing or assignment. A primary service retains this status in terms of the Radio Regulations and the National Radio Frequency Plan.

198 According to the Radio Regulations, the National Radio Frequency Plan, the WRC-23 outcome report and even the draft National Radio Frequency Plan, 2025, clearly give FSS primary status in this Band, while mobile allocation is on a secondary basis.

199 Making the protection of primary services conditional on registration in a local/domestic database is -

199.1 legally impermissible; and

199.2 would have the practical effect of stripping lawful primary users of their right to protection to which they are lawfully entitled in terms of the Radio Regulations and the National Radio Frequency Plan.

200 Subordinate regulations cannot override legislation. As explained above, ICASA is a creature of statute and is obliged to exercise its powers and perform its functions and duties within the parameters of its empowering statutes, including the ECA.

201 As explained in detail above, it is the function of ICASA to control, plan, administer and manage the use and licensing of the Radio Frequency Spectrum and, in doing so, to manage, reduce and eliminate interference.

202 In doing so, ICASA must comply with the Radio Regulations and the National Radio Frequency Plan, which, respectively, set out the international and national framework for managing interference caused by secondary users in a band to the primary users.

203 Both the Radio Regulations and the National Radio Frequency Plan are very clear on the hierarchy between primary and secondary services.

204 The National Radio Frequency Plan says:

"Secondary services are on a non-interference and non-protection basis (NINP) to the primary services."⁸ Spectrum assigned on a secondary basis means that the secondary station:

- (i) cannot cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date;
- (ii) cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date, however;
- (iii) can claim protection from interference from stations of the secondary service(s) to which frequencies may be assigned at a later date." (Our emphasis)

205 Substantially the same provisions appear in Article 5.28 of the Radio Regulations.⁵⁸

206 Footnote 8 of the National Radio Frequency Plan refers to Article 4.4 of the Radio Regulations, which says:

"Article 4.4 of the Radio Regulations: Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations." (Our emphasis)

207 It is plainly impermissible for ICASA to make the protection of a primary user from harmful interference from a secondary user conditional upon registration by the primary user.

208 It is clear from the above that ICASA cannot refuse to deal with a case of "harmful interference" based on an *ultra vires* regulatory requirement for registration of a primary user of the Band as a prerequisite for interference. This requirement alone would render the Draft Regulations liable to be set aside.

⁵⁸ Article 5.28 of the Radio Regulations says:

"Stations of a secondary service:

- (a) shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date;
- (b) cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date;
- (c) can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date."

- 209 There is nothing preventing ICASA from issuing a public notice for information from time to time requiring all users of the Band, e.g. space station operators and earth station owners, to notify ICASA regarding their usage of the Band for the purposes of keeping its database up to date. However, failure to register when launching primary services in the Band in compliance with the ITU Radio Regulations would not negate ICASA's statutory obligation to protect primary users in the Band from interference.
- 210 Indeed, MultiChoice believes that a registration requirement could be a useful practical tool to promote coexistence and coordination and to expeditiously address any incidents of interference which may arise from time to time despite the implementation of sound interference prevention measures. For example registration could be of practical assistance as an additional measure to facilitate the protection of receive-only FSS sites in the C-band from interference.⁵⁹ Registration could, therefore, be a useful practical tool to assist ICASA and affected stakeholders to expedite the investigation and identification of the source of interference, and could enhance visibility, transparency, coordination and coexistence.
- 211 However, any such registration requirement should be on the basis that:
- 211.1 Registration is not a pre-requisite for protection from interference. (i.e., Protection from interference may not be conditional on registration). On no basis should registration be a pre-condition for protection from interference.
 - 211.2 Nor should the responsibility for resolving interference be placed on unregistered primary users in the Band.
 - 211.3 Primary users must be protected from interference based on the hierarchy set out in the Radio Regulations and the National Radio Frequency Plan, with which ICASA is bound to comply.

⁵⁹ These are lawful primary users in this Band which are entitled to protection from interference from secondary users, even though they are not required to be issued frequency spectrum licences for their receive-only sites.

- 212 It is incumbent on ICASA, in developing a spectrum sharing framework, to create, in advance, the necessary preconditions for spectrum sharing and ensure prior coordination and coexistence before sharing commences.
- 213 To the extent that the Authority wishes to provide for a registration requirement, such registration -
- 213.1 should be on the basis set out in paragraph 211 above;
 - 213.2 should be a practical tool to promote coordination and coexistence;
 - 213.3 is not a substitute for prior coordination and coexistence;
 - 213.4 should be transparent and available to all lawful users in the Band; and
 - 213.5 should be used to guarantee lawful primary users in the Band immediate protection in the event of interference which may arise notwithstanding the implementation of sufficient prior measures to prevent interference.

(6) Insufficient measures to mitigate against interference

- 214 A further fundamental problem with the Draft Regulations is the lack of sufficient measures to deal with interference.
- 215 We recognise that one of the purposes of the Draft Regulations is to mitigate against harmful interference between the incumbents and the secondary users in the so-called innovation spectrum.⁶⁰ However, the measures proposed in the Draft Regulations are massively insufficient to mitigate against interference.
- 216 Unlike the international case studies in the UK, Europe and the USA, where significant actions are taken up front to ensure coordination, coexistence and protection of incumbent users both in terms of current and future use of the Band, ICASA has failed to put in place sufficient measures in the Draft Regulations to

⁶⁰ Draft Reg. 3(b)

protect incumbent users from interference, both in respect of current usage and future usage of the Band for expansion of services by incumbents.

- 217 First, we note that the Draft Regulations provide only for protection from harmful interference. The Draft Regulations do not provide for any protection of primary users from interference which falls short of harmful interference, notwithstanding ICASA's statutory obligations in that regard. Moreover, those provisions in the Draft Regulations that are intended to deal with harmful interference do not do so adequately. ICASA should not be creating a regulatory framework that permits any interference, not just "harmful interference" having regard to the definitions and interference management provisions in the ECA.
- 218 Second, the proposal to make the protection from harmful interference conditional upon prior registration with the Authority undermines the measures to mitigate against interference. As explained above, the interference mitigation protocol in Draft Regulation 12 impermissibly proposes making the protection of primary users in the Band dependent upon registration in accordance with the process set out in Draft Regulation 11(1) and (2). This Draft Regulation clearly states that only entities registered in the local database are permitted to report radio frequency interference. FSS operators who are not registered may therefore be denied protection and will be solely responsible for resolving the interference, even though they hold primary status under ITU Radio Regulations and the National Radio Frequency Plan. This clearly undermines the primary status of FSS and contradicts international spectrum management principles and efficient operations, and is *ultra vires* the ECA.
- 219 Third, the proposed investigation timeframes do not appear to consider that broadcasting services require 100% uptime and cannot tolerate interference even if the interference lasts only a few seconds. Any disruption, no matter how brief, can result in significant service degradation and reputational damage. There accordingly needs to be adequate pre-emptive coordination by ICASA on a case-by-case basis prior to licensing with adequate geographical separation distances being implemented to protect incumbent users of the Band. In this regard, ICASA should consider the extensive studies conducted in the EU and the UK.

- 220 In particular, it is highly recommended that ICASA consider in more detail the recommendations pertaining to co-existence in the Band contained in the ECC Report 358: In-band and Adjacent Bands Sharing Studies to Assess the Feasibility of the Shared Use of the 3.8-4.2GHz Frequency Band by Terrestrial Wireless Broadband Low/Medium Power (WBB LMP) Systems Providing Local-Area Network Connectivity. The statement by ICASA indicating that its simulation results are inconsistent with studies done by CEPT is very concerning.⁶¹ If the simulation has been done using the correct parameters then there should be consistency with the international findings, but they differ starkly.
- 221 The interference mitigation protocol should also make the track record of an IS licensee, with regards to coordination and resolving interference, a factor when considering the validity period of the IS licence and when considering renewal. Renewal should not only consider spectrum availability.

(7) Non-compliance with s36 of the ECA in respect of technical standards

- 222 A further fundamental problem with the Draft Regulations is the failure to comply with s36 of the ECA in respect of technical standards for equipment and electronic communications facilities.
- 223 The Draft Regulations fail to prescribe key technical standards. Instead, the Draft Regulations contain fleeting references to various requirements and leave key operational provisions and standards to be determined by other parties. For example:
- 223.1 "Client device" is defined as meaning *"an ISD certified by the Authority to operate without an exclusive license in ISFR1 and ISFR2. It is not authorized to communicate with the USS to request operational parameters for itself but may receive such parameters from an associated Master device."* This definition leans towards a technical specification of the device performance rather than defining a term.

⁶¹ Annexure A of the Draft Regulations, A1.4.1 Key Insights, 2nd bullet

- 223.2 "Communication Protocol to Access Unified Spectrum Switch (CPAUSS)" is defined as meaning "*a secure machine-to-machine communication standard defined by the Council for Scientific and Industrial Research (CSIR), designed for ISDs to automatically access USS services*".
- 223.3 "Innovation Spectrum Customer's Premises Equipment Category 1 (IS-CPE Cat 1)" is defined as meaning "*a client device equipped with geo-location capability, permanently affixed to a structure certified by the Authority, and authorized to operate without an exclusive licence in ISFR 1. This device is capable of communicating with an associated Master device.*"
- 223.4 "Innovation Spectrum Customer's Premises Equipment Category 2 (IS-CPE Cat 2)" is defined as meaning "*a client device equipped with geo-location capability, permanently affixed to a structure certified by the Authority, and authorized to operate without an exclusive license in ISFR 2. This device is capable of obtaining Operational Parameters (Ops) from the Unified Spectrum Switch (USS) and communicating with an associated Master device*".
- 223.5 "Unified Spectrum Switch (USS)" is defined as meaning "*a database system operated by an entity that has been authorized by the Authority to calculate and generate Operational Parameters for ISDs ...*". It is unclear if what is defined here is based on a technical standard for which technical specifications, protocols, devices, databases, servers and software are available in the market. If indeed this is standardised, then referencing the standard would be useful. If not, then detailed specifications and standard should be developed ahead of regulation.
- 224 Alarming, the Draft Regulations do not set out the operational requirements and standards, at times simply leaving these to be determined by another entity, such as, in the case of the CPAUSS, the CSIR.
- 225 In this regard, the Draft Regulations fail to comply with the provisions of s36 of the ECA.

- 226 In terms of s36(1) of the ECA, it is the Authority - ICASA - which must "*prescribe standards for the performance and operation of any equipment or electronic communication facility, including radio apparatus*", in accordance with the requirements in s36(2) and (3), including s36(3)(a) of the ECA.
- 227 "Prescribe" is defined in s1 of the ECA as meaning "*prescribed by regulation made by the Authority in terms of [the ECA] or the related legislation*".
- 228 Any such standard must be aimed at, amongst other things, protecting the integrity of the electronic communications network, ensuring the proper functioning of connected equipment or electronic communications facilities and, importantly in the context of these Draft Regulations, avoiding harmful interference.⁶²
- 229 We are mindful that Regulations made by ICASA in terms of s36 of the ECA may incorporate any technical standard by reference to the number, title and year of issue of the technical standard, or other particulars by which the particular standard can be identified.⁶³
- 230 However, it is noteworthy that when technical standards are developed, by the SABS for example, that is done in a transparent⁶⁴ and consultative manner, and in accordance with the applicable legislative provisions.
- 231 The ECA clearly requires comprehensive and transparent standards, determined in advance, which would enable all interested and affected parties to conduct their affairs accordingly.
- 232 Merely leaving these matters to be determined by another party, without providing for transparency, consultation and for the standards to be determined and made known in advance, falls far short of the requirements of the ECA and just administrative action.

⁶² s36(2)(a), (b) and (d) of the ECA

⁶³ s36(3)(a) of the ECA

⁶⁴ Amongst other requirements, the text of each incorporated technical standard must be open to inspection (s36(3)(e) of the ECA)

233 The lack of detailed specifications and standards, and the proposed relegation of some of these functions to other parties, undermines the Draft Regulations and renders them susceptible to legal challenge.

In summary:

234 Several fundamental problems with the Draft Regulations render them fatally flawed and make them vulnerable to legal challenge.

235 The Draft Regulations create a technology-specific regulatory framework which appears to reserve spectrum for specific devices / technology only and inhibits the growth of existing users in the Band, without taking into account the growth of existing satellite operations.

236 The Draft Regulations suffer from fundamental flaws in respect of the USSP. They contain insufficient information about the proposed USSP framework and they seek to effectively outsource essential functions which fall within ICASA's domain. This is an impermissible and unlawful delegation of ICASA's powers, functions and duties which is susceptible to legal challenge.

237 The Draft Regulations lack the necessary accountability, openness and transparency. Interested parties have minimal insight and many aspects of the draft framework are hazy.

238 The licensing and registration provisions are unclear and appear to be out of line with the ECA and the existing radio Frequency Spectrum Regulations.

239 The Draft Regulations irregularly provide that any incumbent or existing user of the Band who is a primary user will not enjoy protection from harmful interference if they fail to register with ICASA, and shift the sole responsibility for resolving interference to unregistered users.

240 ICASA has failed to put in place sufficient measures in the Draft Regulations to protect incumbent users from interference, both in respect of current usage and future usage of the Band for expansion of services by incumbents. The interference mitigation measures are wholly inadequate.

241 The Draft Regulations lack clear operational specifications and standards prescribed by the Authority in terms of s36 of the ECA.

ICASA'S APPROACH IS OUT OF LINE WITH INTERNATIONAL BEST PRACTICE

242 The following section demonstrates that ICASA's approach is not aligned with international best practice. Unlike the international case studies in the UK, Europe and the USA, where significant actions are taken up front to ensure coordination, coexistence and protection of incumbent users both in terms of current and future use of the Band, ICASA has failed to put in place similar sufficient measures in the Draft Regulations to protect incumbent users from interference and harmful interference, both in respect of current usage and future usage of the Band for expansion of services by incumbents.

United Kingdom

243 ICASA has cited in its benchmarking study a successful implementation in the United Kingdom where Ofcom implemented a Shared Access Licence ("SAL") framework across various portions of unassigned spectrum, including the 3.8–4.2GHz Band. It is thus useful to consider the Ofcom case study in more detail.

244 In July 2019, Ofcom published a statement "Enabling Wireless Innovation through Local Licensing"⁶⁵ which proposed two new licensing types aiming at permitting greater access to radio frequency spectrum on a locally licensed basis. The two frameworks were:

- 244.1 Shared Access Licence (SAL) – aimed at granting access to four spectrum bands (1800MHz, 2300MHz, 3.8-4.2GHz and the lower 26GHz) to support mobile technology; and
- 244.2 Local Access Licence - aimed at granting access to spectrum that has already been licensed nationally to mobile network operators (MNOs),

⁶⁵ Enabling Wireless Innovation through Local Licensing: Shared Access to Spectrum Supporting Mobile Technology, Ofcom, 25 July 2019 (the "Ofcom Statement")

in locations where the spectrum is not used by the MNOs (subject to co-ordination and agreement with the holder of the national licence).⁶⁶

245 Ofcom identified that access to suitable spectrum for local deployment could play a vital role in driving innovation across various industries and sectors where there is demand for bespoke solutions. In its SAL implementation it made four RF spectrum bands available. As the cartoon below illustrates not everyone was excited about the allocation of 3.8-4.2GHz, mainly because one of the primary purposes of the SAL was promoting innovation and it was felt that this spectrum was limited to 5G NR waveforms only and was unsuitable for neutral host operation, leading to the view that the spectrum was best suited to private network use only, thus limiting innovation.



246 The 3.8-4.2GHz band prior to introduction of SAL licence in the UK was used by three main types of users: satellite earth stations, point-to-point fixed links and FWA provided by UK Broadband. The deployments of these three types of users in the Band were technically coordinated by Ofcom on a first come, first served basis in order not to cause undue interference between users. Ofcom undertook to introduce new SAL users on the same basis in this Band, i.e. new users would

⁶⁶ The Ofcom Statement says:

"Where spectrum is licensed on a national basis to mobile network operators and is not being used in every location, we think it is appropriate to enable access to this spectrum for new users. If we agree, following discussion with the incumbent licensee, that the new user is unlikely to interfere with their network or constrain their future plans, we will issue a local access licence" (Para 1.111 of the Ofcom Statement, Our emphasis)

access spectrum under a similar coordination approach as for existing users in the 3.8-4.2GHz band.⁶⁷

247 In the public consultation process a number of satellite users, including the BBC, BT and Intelsat, were worried that the introduction of new users in the 3.8-4.2GHz band would mean interference to existing earth stations.⁶⁸ In its final Statement, Ofcom reassured satellite users that it would only license new users if their licence application was successfully coordinated and that the protection criteria used to coordinate with existing services would remain the same as those in effect for the existing users of the Band.⁶⁹

248 Two types of SAL licences were provided for:

248.1 Low power licence - This authorises users to deploy as many base stations as they require within a circular area with a radius of 50 metres as well as the associated fixed, nomadic or mobile terminals connected to the base stations operating within the area. Users then have the flexibility to move base stations around within the licensed area without requiring further coordination by Ofcom. There is an indoor and outdoor option. Indoor covers the entire building irrespective of height, outdoor limits the antenna height to 10m height above ground.

248.2 Medium power licence - This authorises a single base station and the associated fixed, nomadic or mobile terminals connected to the base station. The licence is suitable for providers of FWA services in rural areas, along with industrial or enterprise users with sites spread over a larger area, such as ports, agriculture or forestry.

249 It is worth noting that the Medium Power licence was limited to rural areas only up to December 2024, and in urban areas would only be accessible via an

⁶⁷ A concern was raised in the public consultation process that expanding access to new users may reduce the amount of spectrum available for the incumbent users e.g. earth stations to expand their services in some locations. Ofcom did not consider this potential impact to be significant, however there is no indication that Ofcom did any empirical research to support their view that the impact was unlikely to be significant.

⁶⁸ Para 3.14 of the Ofcom Statement

⁶⁹ Para 3.15 of the Ofcom Statement

"Exceptions" process. This was due to the presumption that users of the low power Shared Access licence are more likely to want to deploy in urban areas. If medium power users also deployed in urban areas, with their higher power and increased range, this could risk low power users suffering from limited or no availability of spectrum. In December 2024, Ofcom reviewed this decision due to confirmed improvements in their coordination methodology. Thereafter, Medium Power was available as a standard application in urban areas (up to an antenna height of 10m, and subject to the application passing coordination), save for Greater London, where exceptions are still required. Any applications for antenna heights greater than 10m in urban areas would still require an exceptions process.

250 Ofcom remains clear that it is not permitted to use the Medium Power licence in the 3.8-4.2GHz Band to provide wide area mobile broadband services. Those type of implementations have to consider using other bands (e.g. 3.4-3.8GHz band) which have been identified for that purpose.

251 The SAL framework enables access to the four bands under a common process, as outlined below:

251.1 One must apply to Ofcom to get licences for the locations, bands and bandwidths that they need to provide a service.

251.2 Ofcom will assess the applications to see if any interference would be caused to, or received from, other licensees in the Band.

251.3 Ofcom will grant individual licences for the requested locations, bands and bandwidths on a first come, first served basis, provided that the application passes this coordination process and there is no interference to other users in the Band.

251.4 The licensee will pay licence fees to Ofcom, which are due annually.

251.5 There may be some differences between conditions in the different bands. For example, each of the bands has different existing users and

therefore Ofcom's approach to assessing applications may look different from band to band because of different interference risks.

252 In terms of usage of the 3.8-4.2GHz Band in the UK by new users, an Analysys Mason study conducted in 2023 for the UK Spectrum Policy Forum⁷⁰ determined that this Band is being used for a variety of private wireless network and local wireless network use cases, using 5G radio technology and private 5G network configurations. These were mainly proven use cases e.g. FWA and some emerging enterprise and industrial use cases e.g. private wireless networks for enterprises and industrial companies. A third key use was for live video and audio content production by the media industry.⁷¹

253 At the time the study was conducted, there were 674 SALs in use by a total of 62 individual companies/organisations. The shared access medium-power licences accounted for 72% of the total number of SALs issued.⁷² These were all in rural areas. The largest group of licensees at 56% was internet service providers ("ISPs"). In the view of the researchers this was probably due to UK government policies such as Project Gigabit aimed at achieving 99% gigabit broadband coverage in the country by 2030, prompting ISPs to deploy FWA in rural areas to enhance broadband connectivity.⁷³

254 Analysys Mason specifically concluded that the characteristics of the 3.8-4.2GHz band make it suitable for FWA use in rural areas:

*"[T]he characteristics of the 3.8-4.2GHz band give a good balance between penetration and propagation, which makes it suitable to support the FWA use case especially in rural areas."*⁷⁴ (Our emphasis)

255 When SALs were introduced in the UK some parties expressed the view that there should be opportunistic access to spectrum via a dynamic spectrum access

⁷⁰ Final Report for UK Spectrum Policy Forum, Review of Use Case Requirements in the 3.8-4.2GHz Band via Ofcom's Shared Access Licence Framework, Analysys Mason, Reference number: 8884698679-391, Analysys Mason, 10 October 2023 (the "Analysys Mason Report")

⁷¹ Pg 3 of the Analysys Mason Report. It was also noted that not all SAL use cases require licences for a long, indefinite period as some only require it for a short defined period, for example to provide localised connectivity to support content production during a live event

⁷² Pg 14 of the Analysys Mason Report

⁷³ Pg 16 of the Analysys Mason Report

⁷⁴ Pg 36 of the Analysys Mason Report

(DSA) solution. Ofcom kept the door open in their policy for future use of DSA, but proceeded with an Ofcom managed process based on a database for co-ordinated use of the 3.8-4.2GHz Band, due to the fact that capabilities to provide a fully automated DSA process with geolocation and sensing (e.g. CBRS approach in the USA) would take time to implement.

256 The Analysys Mason Report concluded that the Ofcom managed process for co-ordinated use of the Band (i) appears to be optimal to address the current and future uses cases based on customised licences in terms of geographical area and bandwidth; and (ii) this remained true even if the volume of applications increased. This was due to the bespoke nature of many of the local networking systems being applied for which benefited from an Ofcom managed process to grant exclusive and co-ordinated spectrum assignments in a given location and bandwidth. The report further concluded that while DSA implementation for opportunistic access to the spectrum is not a priority, putting the application process online via web based tool was advantageous.

257 As mentioned above the UK commenced its process in respect of the Band as early as 2019. This made them the first adopter among European countries and, although Ofcom moved before studies were conducted in the rest of Europe on co-existence between new services and satellite services in the Band, extensive comprehensive studies were conducted in the UK.

258 The shared spectrum access regime in the UK is the culmination of various consultations spanning several years. As early as 2011 Ofcom undertook a consultation on how to recognise and protect the receive-only earth stations.⁷⁵ Ofcom has consulted extensively and conducted comprehensive studies over several years.

259 We note that key technical conditions in the UK e.g. EIRP and antenna heights are aligned with the current limits being proposed in Europe. There are also other noteworthy case studies of private wireless network deployments in Europe authorised in different bands to the UK, these include France in 2.6Ghz, Sweden

⁷⁵ Recognised Spectrum Access ("RSA") for Receive Only Earth Stations in the Bands 1690 – 1710 MHz, 3600 – 4200 MHz and 7750 – 7850 MHz, Ofcom, 11 May 2011

in 3.6GHz and Germany in 3.7 to 3.8GHz. These case studies demonstrate a similar range of potential private 5G network uses similar to those being carried out in the UK. This highlights that there are alternatives to the 3.8-4.2GHz Band that can deliver the same benefits for new users as evidenced in the UK.

Key takeaways from the UK:

- 260 The shared licence scheme was focused on enabling low power 5G private networks.
- 261 The policy makes provision for future use of dynamic spectrum access (DSA) on an opportunistic basis, but was launched as an Ofcom managed process. Studies that have been conducted since SAL implementation have concluded that the Ofcom managed process is optimal as opposed to DSA. This is due to the bespoke nature of many of the local networking systems being applied for, which benefited from an Ofcom managed process to grant exclusive and co-ordinated spectrum assignments in a given location and bandwidth.
- 262 Ofcom assesses all applications on case-by-case basis to see if any interference would be caused to, or received from, other users (including satellite services) in the Band. Ofcom only grants a licence provided that the application passes this coordination process.
- 263 The shared access licence is limited to low power and medium power. The lower power is for a circular area with radius of 50 meters centred on a co-ordinate provided by the applicant.
- 264 Medium power implementation was limited to rural areas to avoid limiting spectrum access to low power users in urban areas. This restriction was only lifted in December 2024 when Ofcom could confirm improvements in their coordination methodology. Any applications for antenna heights greater than 10m in urban areas would still require an exceptions process to be followed.
- 265 Ofcom reassured satellite users in policy that they would only license new users in the Band if they caused no interference and that the protection criteria used to coordinate new users with existing services would remain the same as was

currently in effect at the time for the existing users of the Band. Ofcom has remained true to that commitment.

Europe

266 As the UK was a first mover, it is useful to consider the current approach in Europe.

267 The European Commission ("EC") issued a mandate to the CEPT to evaluate the feasibility and the shared use of the 3.8-4.2GHz Band by terrestrial wireless broadband systems providing local area network connectivity. The CEPT brings together national regulatory authorities (NRAs) responsible for electronic communications to collaborate on issues like frequency management and standardisation. There were two tasks under the EC mandate, firstly to conduct feasibility and sharing studies on the shared use of the Band, and secondly consider harmonised technical conditions for the shared use of the Band. In terms of the mandate, the technical conditions should consider sharing solutions, including protection and future evolution of incumbents (FSS, FL).

268 CEPT requested one of its main bodies, the ECC, which develops policies and actions to harmonise spectrum use across Europe, to work on the EC Mandate. This resulted in the ECC Report to assess the feasibility of shared use of the Band by terrestrial wireless broadband low/medium power systems (WBB LMP") which we referred to above.

269 The ECC Report contains studies and relevant analysis on a range of coexistence conditions to minimise interference between WBB systems and other services in the 3.8-4.2GHz Band, such as:

269.1 geographical separation;

269.2 frequency separation;

269.3 maximum allowed power levels and antenna heights for WBB LMP;

269.4 limiting unwanted emissions; and

269.5 transmission power control.

270 The ECC Report specifically considered in-band coexistence and adjacent band coexistence.⁷⁶

271 As regards in-band coexistence of WBB LMP with FS and FSS, the ECC Report concluded:

"It is not possible to define generic technical conditions that guarantee the protection of FSS. Careful planning and case-by-case analysis is needed, in combination of considering appropriate mitigation techniques, to ensure the protection of current and future deployment of FSS. In addition, due to the large separation distances that may be necessary, the protection of FSS cannot always be managed at national level only but may require cross border coordination on a case-by-case basis as well as bilateral or even multilateral agreements between neighbouring countries."⁷⁷ (Our emphasis)

Key take-aways from Europe:

272 A key take-away from the reports submitted to the ITU is that there cannot be a general "one size fits all" approach to interference on FSS receive sites. Similar, to the current approach adopted by Ofcom in the UK, each case needs to be evaluated for interference based on its specific terrain.

273 Additionally, the model used in Europe is based on the fact that the locations of new licensees are known together with the location of FSS receive sites.

274 The licensed sharing regime for Europe is focused on private networks, that are contained within a business's territory.

275 In the EU it is clearly accepted that it is not possible to define generic technical conditions that guarantee the protection of FSS. Careful planning and case-by-case analysis is needed, in combination with considering appropriate mitigation techniques, to ensure the protection of current and future deployment of FSS. In addition, large separation distances are typically necessary.

⁷⁶ Pg 2 of the ECC Report

⁷⁷ Pg 3 of the ECC Report

United States of America

- 276 ICASA has referred to the Citizen Broadband Radio Spectrum ("CBRS") in the United States of America ("USA") where 150MHz of spectrum in the 3.5GHz band was set aside for sharing spectrum between incumbent federal, state and local users for wireless networks.
- 277 However, CBRS is generally regarded as a policy failure in the USA where recent studies showed very low utilisation and no apparent innovative use of the spectrum. The majority of usage is for traditional wireless broadband deployments. The studies concluding that more value and more efficient spectrum use would have been realised if a traditional exclusive use, licensed commercial spectrum approach had been adopted. A 2022 study showed that, more than a decade after CBRS implementation concluded, *"There is no evidence at this time that CBRS sharing is a model to emulate"*.⁷⁸
- 278 Of more relevance in the USA, is that mid-band spectrum was a focus area of the US Congress in the Making Opportunities for Broadband Investment and Limiting Excessive and Needless Obstacles to Wireless Act (MOBILE NOW Act), when it considered how to address the pressing need for more spectrum for wireless broadband. Specifically, s605(b) of the MOBILE NOW Act requires the Federal Communications Commission ("FCC") to evaluate *"the feasibility of allowing commercial wireless services, licensed or unlicensed, to use or share use of the frequencies between 3700 megahertz and 4200 megahertz."* The primary intent in the USA is to free up spectrum for next generation 5G mobile wireless networks.
- 279 The 3.7-4.2GHz band was allocated in the USA exclusively for non-Federal use on a primary basis for FSS and FS. For FSS, the 3.7-4.2GHz band (space-to-Earth or downlink) was paired with the 5.925-6.425GHz band (Earth-to-space or uplink), and collectively these bands are known as the "conventional C-band" in the USA. Domestically, space station operators used the 3.7-4.2GHz band to provide downlink signals of various bandwidths to licensed transmit-receive,

⁷⁸ CBRS: An Unproven Spectrum Sharing Framework, Recon Analytics, November 2022, pg 9

registered receive-only, and unregistered receive-only earth stations throughout the USA. FSS operators use this Band to deliver programming to television and radio broadcasters throughout the country and to provide telephone and data services to consumers. The 3.7-4.2GHz band is also used for reception of telemetry signals transmitted from satellites to earth stations, typically near the edges of the Band. As part of their investigation into feasibility, the FCC issued a public notice to space station operators and earth station owners to file certifications and information regarding their 3.7-4.2GHz usage.

280 In their public processes the FCC determined that licensing mid-band spectrum for flexible use through a public auction process would lead to substantial economic gains, with some economists estimating billions of dollars in increases on spending, new jobs, and America's economy. At the same time, the FCC also recognized the significant benefit to consumers provided by incumbent FSS services throughout the USA. The FCC undertook to take action to make this spectrum resource available for new terrestrial wireless uses as quickly as possible, while also preserving the continued operation of existing FSS services during and after the transition. The FCC made a finding that, based on notifications received from incumbents, space station operators will be able to maintain the same services in the upper 200 MHz as they are currently providing across the full 500MHz of C-band spectrum. Thus the FCC adopted rules in 2020 to reform the use of the 3.7-4.2GHz band, also known as the C-Band, by repacking existing satellite operations into the upper 200 megahertz of the Band (and reserving a 20MHz guard band). This repacking of the existing satellite operations made a significant amount of spectrum—280MHz or more than half of the Band—available for flexible use throughout the contiguous USA, and did so in a manner that ensures the continuous and uninterrupted delivery of services currently offered in the band with space for future expansion of those services. In doing so they attempted to strike a balance between making available spectrum for terrestrial use, whilst ensuring sufficient spectrum remains to support and protect the incumbent users.

Key take aways from the USA

281 The FCC decision on repacking the incumbent users of the Band was based on some of the points MultiChoice has already made, that sharing in this Band is not effective or efficient, that co-existence would require very large separation distances rendering it difficult for new users to operate. The FCC solution was to repack the incumbent users to the upper portion of the Band and put in a guard band to protect them from interference. Of course, such a decision is motivated by obtaining maximum value for the freed-up spectrum through a public auction process, which is very different to the shared licensing regime in Europe or ICASA's own proposals where no exclusive licensing regime is envisaged.

Key take aways from international best practice in general:

282 A key element of all the international cases studies that are focused on spectrum for 5G mobile wireless network or private networks in the 3.8-4.2GHz Band is to recognise the importance and value to consumers of the current incumbents operating in the Band and to ensure that there is no interference to the incumbent users when introducing new users in the Band. The manner in which this is achieved may differ between Europe and the USA, but this core intent remains the same.

283 The ICASA process has not given this same level of assurance to the incumbent users that they will have the required level of protection, and that there is planning for their future use of this Band to guarantee the ability to expand services down the road.

OTHER CONCERNS ABOUT THE DRAFT REGULATIONS

284 Given the extent of our concerns and their fundamental nature, and the recommendations we make in the next section, we do not comment on the detailed provisions of the Draft Regulations.

285 However, we wish to bring to ICASA's attention that there are numerous other concerns with the Draft Regulations.

286 For example:

286.1 The concept of "innovative spectrum" is poor, misleading and incorrect. These frequencies are not "unused", but in operation for amongst others, FSS, FS, ISM and VSAT systems at multiple locations across South Africa as detailed in the National Radio Frequency Plan. Spectrum in itself cannot be innovative. Innovation is possible in the licensing approach and the applications delivered by spectrum. It would be important for ICASA to clearly articulate what is "innovative". It may be useful for ICASA to follow the Ofcom example and research and publish a policy statement on how it intends to "enable wireless innovation", what specific needs it aims to address, and how the planned framework would deliver on the need and allow innovation. (We refer in this regard to paragraph 244 above).

286.2 Various terms are used but not defined. For example, the Draft Regulations refer to "an exclusive licence", certification by the Authority, and other terms which ought to be clearly defined.

286.3 Certain terms are defined in the Draft Regulations inconsistently with the ECA. For example, the proposed definition of "interference" in Draft Regulation 1 is different from the definition of "interference" in s1 of the ECA. This is impermissible and confusing.

286.4 Certain terms are defined in the Draft Regulations inconsistently with other ICASA regulations. For example, the proposed definition of "National Radio Frequency Plan" in Draft Regulation 1 is inconsistent with the definition of the same term in the Radio Frequency Spectrum Regulations, 2015 prescribed by ICASA. Conflicting definitions would be confusing and create uncertainty.

286.5 The Draft Regulations refer to regulations which are not yet in force. For example, Draft Regulation 16 requires an ISD to display a label that

adheres to the Equipment Authorization Regulations, 2022. However, those Regulations are not in operation, as the Authority has decided to hold in abeyance the date when these regulations will come into force.⁷⁹ It is ICASA's Labelling and Type Approval Regulations which are relevant in this regard.⁸⁰

OUR RECOMMENDATIONS

287 It is clearly apparent from our extensive submissions, that there are significant problems with the Draft Regulations and the process which was followed to arrive at them. In this context, the most prudent solution may be for ICASA to simply abandon this process and start over. Certainly, any indication that ICASA is pressing ahead with the current approach in the face of the problems which have been identified, will undoubtedly leave it vulnerable to legal challenge.

288 However, we can appreciate that ICASA may be reluctant to incur the costs and additional time involved in starting the process again and we therefore make the following recommendations:

289 If ICASA wishes to persist with spectrum sharing in the 3.8-4.2GHz Band (which we do not support), it is essential that it conduct meaningful, reliable and evidence-based simulations in the Band before proceeding with regulations. The additional simulations must look at a much wider range of use cases in order to properly and fully evaluate the impact on existing users of the Band.

290 For the simulations to be credible, there must be stakeholder involvement in both the design and implementation phase. There is no justifiable reason for such simulations to be conducted in secret. We suggest that ICASA constitutes a committee with industry representation, to input into the design and to comment

⁷⁹ Equipment Authorisation Regulations, 2022, ICASA Reasons Document, published under Notice Number 1948, Government Gazette Number 46145, 31 March 2022, para 9.16(a)

⁸⁰ Regulations for the Type Approval of Electronic Communications Equipment and Electronic Communications Facilities and the Certification of Type Approved Equipment published under Notice Number 871, Government Gazette Number 36785, 26 August 2013, and Labelling Regulations published under Notice Number 872, Government Gazette Number 36785, 26 August 2013

on the results such that the final findings from the simulations are fair, objective, meaningful and reliable.

291 ICASA must consider the results of the simulations before making a final decision on whether spectrum sharing can in fact be implemented in the Band and the manner in which it should be implemented.

292 If the Band is ever to be effectively used for sharing of unused spectrum by secondary wireless users, it is crucial that the scope of the secondary use be narrowly defined. Key criteria in this regard is that the sharing be limited to (i) rural areas (in line with ICASA's objective of expanding broadband access to rural, underserved remote communities and bearing in mind that the separation distance that is necessary to prevent harmful interference makes DSA unfeasible in urban areas), (ii) low and medium power transmission, (iii) on a case-by-case basis following prior coordination (rather than an automated one size fits all dynamic approach to DSA), (iv) in line with a rigorous framework, and that (v) sufficient guard bands and other evidence-based interference mitigation protocols are developed with reference to international best practice.

293 Numerous extensive amendments are required to the Draft Regulations to make them workable. We suggest that ICASA put the current Draft Regulations on hold until the additional simulations have been properly conducted and consulted on.

294 Thereafter, we suggest that ICASA publish a further set of draft regulations, taking into account the comments which have been made by stakeholders on this current draft (e.g. the numerous fundamental flaws which have been identified, including impermissible delegation to the USSP, need for transparency in respect of registration, the licensing arrangements, etc).

295 A further round of written submissions on the next iteration of the Draft Regulations will be necessary before any publication of final regulations.

CONCLUSION

296 MultiChoice is gravely concerned about the approach ICASA has taken in the development of these Draft Regulations. Its approach is out of step with its

mandate to reduce and eliminate interference, and inconsistent with relevant international best practice.

- 297 It is no surprise then that the Draft Regulations are fundamentally deficient in numerous respects. Against this background, MultiChoice submits that ICASA should not proceed with the Draft Regulations and that it should instead focus on conducting thorough simulations, this time with extensive stakeholder involvement.
- 298 The stakes are simply too high to implement DSA in the Band in the manner that ICASA proposes in the Draft Regulations.
- 299 Given the gravity of this matter, we believe it is imperative that hearings be held. We confirm that MultiChoice wishes to participate in such hearings.

ANNEXURE A: COMMENTS ON ICASA'S SUMMARY RESULTS OF SIMULATIONS AND TRIALS

- 1 This Annexure contains MultiChoice's detailed comments on ICASA's Annexure A of the Draft Regulations.
- 2 ICASA's "Annexure A: Summary Results of Simulations and Trials" forms a baseline for the development of the Draft Regulations⁸¹. The title of the annexure suggests that simulations and trials would be reported on. However, the annexure presents only simulation data and contains no evidence that any field measurements or field trials were undertaken.
- 3 The annexure and the simulations seem detached from the regulations and provide only a very limited and superficial approached analysis of sharing and compatibility. The approach and simulations reported are deficient when compared to the rigour and scope of the consultations and studies approaches pursued by OFCOM⁸² and within the CEPT⁸³ and ITU⁸⁴.
- 4 The ICASA simulations are wholly insufficient as a basis for regulation-making and informing any automated approach to spectrum access.
 - 4.1 The simulations rather simplistically consider only a single base station interferer rather than the envisaged multiple licensees on multiple

⁸¹ Para 5 of ICASA's notice accompanying the Draft Regulations

⁸² Enabling Wireless Innovation through Local Licensing: Shared Access to Spectrum Supporting Mobile Technology, Ofcom, 25 July 2019 (the "Ofcom Statement"); Recognised Spectrum Access ("RSA") for Receive Only Earth Stations in the Bands 1690 – 1710 MHz, 3600 – 4200 MHz and 7750 – 7850 MHz, Ofcom, 11 May 2011; Recognised Spectrum Access ("RSA") for Receive Only Earth Stations in the Bands 1690 – 1710 MHz, 3600 – 4200 MHz and 7750 – 7850 MHz, Statement on terms of New Grants; and Statutory Notice of Ofcom's Intention to Make Regulations, Ofcom, 11 May 2011

⁸³ Electronic Communications Committee Report 358: In-band and Adjacent Bands Sharing Studies to Assess the Feasibility of the Shared Use of the 3.8-4.2GHz Frequency Band by Terrestrial Wireless Broadband Low/Medium Power (WBB LMP) Systems Providing Local-Area Network Connectivity, CEPT Electronic Communications Committee, approved on 28 June 2024 and corrected on 7 March 2025 and Attachments 01-22 to ECC report 358 containing the detail of the extensive studies done, available on-line at <https://docdb.cept.org/download/4674> (last visited 28 May 2025)

⁸⁴ See the independent review of comprehensive review of 26 studies done by industry bodies and within ITU-R by Womersley, LS Telcom in 2021, A review of 5G / Satellite Compatibility Studies in C-band, LS Telcom UK Ltd, 20 October 2021, available on-line at https://www.lstelcom.com/fileadmin/content/lst/marketing/brochures/C-band_compatibility_report.pdf (last visited 28 May 2025)

frequencies within the Band and with multiple base stations and user terminals in fixed and mobile usage modes. These additional usage scenarios dramatically change the interference to FSS receive points and cannot be overlooked.

- 4.2 Furthermore, the simulations model the benefit of a "protection distance"⁸⁵ and ICASA notes in Key Insights A1.4.1 that combining the I/N protection ratio and the protection distance proves effective in reducing interference. However, the Draft Regulations make no mention of "protection distance". The simulations thus recommend a regulatory measure which is not provided for in the Draft Regulations. The regulations contain no detail on how such a protection distance might be calculated, what thresholds would be used, and how this would be proclaimed, implemented and enforced, if at all.
- 5 The ICASA simulations could have benefitted greatly from peer review and engagement with industry. Numerous errors are evident. These errors put in doubt the scientific validity of the simulations presented. ICASA lists several invalid assumptions and applies incorrect performance values whilst not sufficiently clarifying the protection thresholds it applied when assessing the interference risk of the BWA transmission to the FSS systems. For example:

⁸⁵ Pg 30 of the Draft Regulations

Common Parameter	Value
Frequency band	3810 MHz
Protection distance	0 km
Protection criterion (I/N)	-10.5 dB
Channel bandwidth	10 MHz
Radio propagation model	ITU-R P.452-1
Clutter model	ITU-R P.2108
Situation	Outdoor
Digital terrain model	Aster (30m/30m)

FSS Receiver Parameter	Value	BWA Transmitter Parameter	Value
Sensitivity	-98 dB	Tx power	27 dBm
Noise figure	5 dB	Height	36104 m
Noise floor	-120 dB	Earth mask	3GPP TS 36104
Azimuth	113 deg	Antenna pattern	ITU-R F.1336-4
Elevation angle	43 deg	Location	CSIR, PTA
Height	15 m		
Dish size	7 m		
Antenna pattern	ITU-R S.465-6		
Location	Randburg, JHB		

Callout Boxes:

- Sensitivity is expressed as signal power for a given modulation and code rate, and not a ratio.** (Points to -98 dB)
- The noise floor is as measure of residual noise power, not a ratio** (Points to -120 dB)
- Incorrect. This is a ratio not a power value. A power value is required** (Points to 5 dB)
- Incorrect value assumed. Noise figure for FSS systems deployed in SA is typically 0.8-0.9 dB (or a noise temperature of 60-70K)** (Points to 5 dB)
- Invalid. Geostationary satellites would not be visible at this azimuth from the location simulated** (Points to 113 deg)
- Invalid. A negative elevation angle applies for the simulated location towards the geostationary arc** (Points to 43 deg)

Figure 1: Figure 1: Illustration of errors in assumption data listed by ICASA in Table A1.4a and Table A1.4b

- 5.1 ICASA lists invalid azimuth and elevation values for the FSS dish at the simulated receive location. The geostationary arc to which a FSS dish would have to be pointed is behind the horizon for the parameters ICASA lists. (i.e. the dish is not pointed at a satellite and cannot be pointed at a satellite under the assumed values). With ICASA's invalid assumptions on the pointing of the dish any simulation or assessment of interference to the dish would be invalid as well.
- 5.2 ICASA confuses signal level (or power values) with ratios. It is thus unclear what signal level or protection threshold level was used in the simulations and if this is valid, or if it would provide sufficient protection from interference and is representative of the real-life situation in South Africa.
- 5.3 ICASA uses an incorrect noise figure for the FSS receiver. FSS installation in South Africa typically have a noise temperature in the order of 60-70 Kelvin. This equates to a noise figure (NF) of 0.82 to 0.9 dB that is significantly lower than the incorrect value listed by ICASA. The use of an incorrect NF results in an underestimation of the impact of the interference of BWA systems to FSS installations and invalidates the ICASA simulations.

- 6 Notwithstanding the fundamental concerns as detailed above, ICASA lists simulation results in Table A.1.5a that, at a glance, suggest additional errors for the Randburg study. It is unclear how the interference level from a Medium Power BWA source could be lower than from a Low Power BWA source for the same propagation path with the same propagation losses.

FSS Receiver Test Location	Low Power BWA Interference at FSS Receiver (dBm)	I/N (dB)	Pass/ Not Pass	Medium Power BWA Interference at FSS Receiver (dBm)	I/N (dB)	Pass/ Not Pass
Samrand	-175.1	-55.2	Pass	-164.1	-44.1	Pass
Randburg	-170.2	-50.2	Pass	-199.2	-79.2	Pass
Hartebeeshoek	-139.8	-19.8	Pass	-128.8	-8.8	Not Pass

Incorrect. Interference from Medium Power BWA source can not be lower than from a Low Power BWA source for the same propagation path

Figure 2: Figure 2: Concern on tabulated results from Table A.1.5a

- 7 ICASA fails to provide clarity of the threshold level to be protected for FSS receive points or what assumptions it made in the simulations. (ICASA outlines an I/N figure, but does not adequately define N). It is useful to consider that OFCOM consulted on this matter extensively and derived 4 categories and respective protection threshold levels. (i.e. values for N).

Figure 3: Table 1: Protection thresholds applied for Receive Only Earth Stations (ROES)

OFCEM ROES thresholds	Threshold 1 (-161 dBW/MHz to less than -159 dBW/MHz)	Threshold 2 (-159 dBW/MHz to less than -149 dBW/MHz)	Threshold 3 (-149 dBW/MHz to less than -139 dBW/MHz)	Threshold 4 (-139 dBW/MHz or higher)
Lower threshold in dBW/MHz	-161	-159	-149	-139
Upper threshold in dBW/MHz	-159	-149	-139	
Lower threshold in dBm/MHz	-131	-129	-119	-109
Upper threshold in dBm/MHz	-129	-119	-109	30

- 8 The ICASA simulations of interference in urban South Africa consider FSS receive location with geographical screening and with significant distance between the simulated BWA transmitter and the FSS receive points.

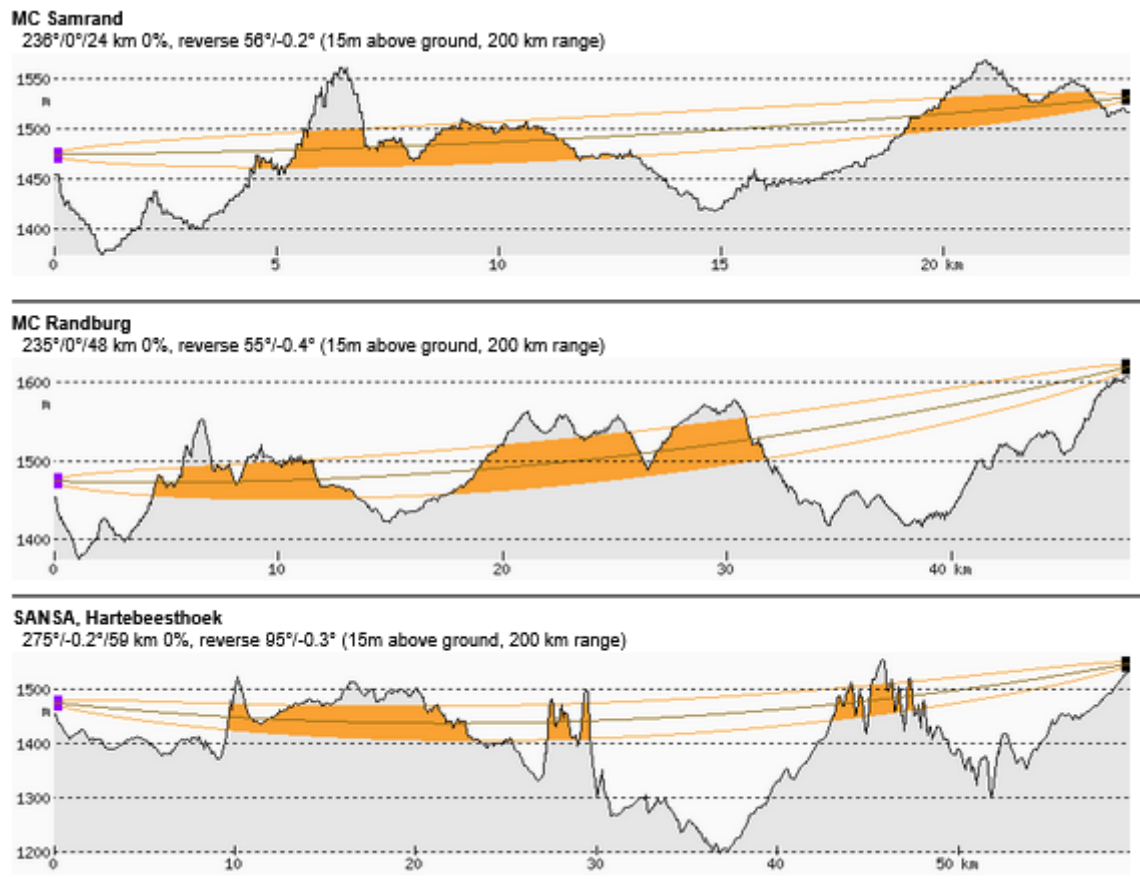


Figure 4: Figure 3: Path profiles from CSIR Brummeria to C-Band FSS receive points considered in the ICASA simulations published⁸⁶

- 9 ICASA has been furnished with details of C-Band FSS receive points over the last three WRC-study-cycles and specifically as part of the one-on-one engagements with stakeholders over the last 12 months on the DSA topic. Stakeholders that use the C-Band for FSS such as ATNS, Sentech, SANSA,

⁸⁶ Path profiles created from known location data using the Fixed Wireless Demo tool available on-line at <https://wisp.heywhatsthat.com/> on 20 May 2025

Globecast, Telemedia as well as diplomatic and security services have been vocal on the need to protect FSS services in the bands.

- 10 The ICASA simulations, however, considered only three FSS receive sites at significant distance from the simulated BWA transmit site at the CSIR. The ICASA simulations did not consider known FSS receive points for which the location information was shared, or the C-Band use has been communicated previously (such as security and diplomatic services) that are in close proximity to the CSIR (simulated BWA transmitter) and not geographically screened.

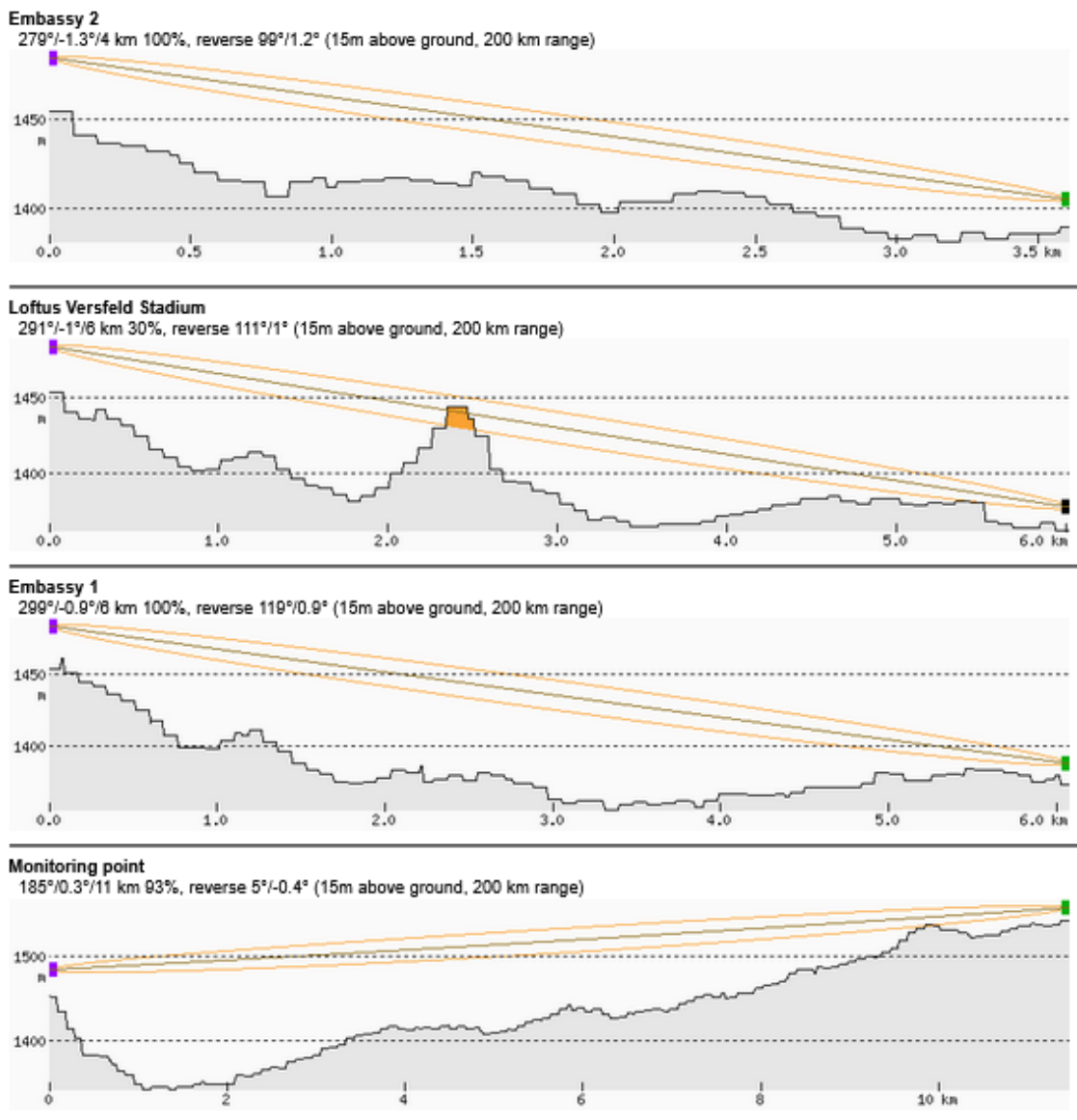


Figure 5: Figure 4: Path profiles from CSIR Brummeria to known C-Band receive points not considered in the ICASA simulations published⁸⁷

- 10.1 These FSS receive locations are in close proximity to the modelled CSIR BWA site with relatively unobstructed signal paths that are predominantly line of sight.
 - 10.2 ICASA did not consider the C-Band FSS receive data submitted to the Authority in their simulations and failed to study or present the real-life interference that will be caused by a BWA transmissions at, among others, a key broadcast site, key sporting venue, as well as diplomatic and security sites impacted by line of sight signal paths from a hypothetical BWA site at the CSIR.
 - 10.3 The ICASA simulations incorrectly create the impression that shared DSA would be feasible in urban areas and in particular the greater area around the modelled CSIR point.
 - 10.4 It is unclear why ICASA did not consider the C-Band usage data shared or model the impact on all known FSS sites. This undermines any notion of ICASA providing due regard to and ensuring protection to FSS receive point submitted for inclusion to a register by ICASA.
- 11 The ICASA simulations of DSA in urban South Africa consider FSS receive location at Hartebeesthoek, Samrand and Randburg. It is unclear what terrain and clutter data ICASA implemented and used in the simulation. Whilst much of the detail of simulation results published by ICASA is illegible, the path profiles provided do not seem to correlate with path profiles derived from three alternative sources. The alternative path profiles from Google Earth Pro, Fixed Wireless Demo⁸⁸ with Land use (clutter) data⁸⁹ and the RTS PtP study Technical report, allow for verification of the elevation data against mapping and location

⁸⁷ Path profiles created from known location data using the Fixed Wireless Demo tool available on-line at <https://wisp.heywhatsthat.com/> on 20 May 2025

⁸⁸ <https://wisp.heywhatsthat.com/>

⁸⁹ The South African National Land Cover (SANLC) 2018 datasets published by Department of Forestry, Fisheries and the Environment (DFFE), <https://www.dffe.gov.za/>

information. This data is consistent between these data sources but differs vividly from the path profiles that ICASA published. Refer to Figure 5 for the Hartebeesthoek path, Figure 6 for Samrand and Figure 7 for the Randburg study and the RTS study attached.

- 12 The differences in the path profiles put into question the reliability of the terrain and clutter data that ICASA applied and thus the validity of results derived, and conclusions reached.
- 13 A summary of some of the FSS receive locations around the simulated BWA site at the CSIR site and the resulting interference power is provided in Table 2. The interference impact is derived based on the free space path Loss (FSPL) and a detailed point-to-point interference study. It is evident that the ICASA simulations grossly underestimated the interference levels and impact at FSS receive points across the limited study area and calls into question the fundamental feasibility of DSA whilst highlighting the deficiency of the simulations presented by ICASA.
- 14 The attached RTS study⁹⁰ provides the detail of the FSPL, clutter losses and the resulting interference power levels derived for the respective FSS receive locations. These differ significantly from the ICASA values and confirm the underestimation of the interference impact in the ICASA simulation. Furthermore, these illustrate the severity of the interference impact on the FSS receive points not considered by ICASA in the simulations.

⁹⁰ PtP Study Technical Report - Rev AA1, Radio Telecommunication Services, prepared for MultiChoice Support Services, 23 May 2025

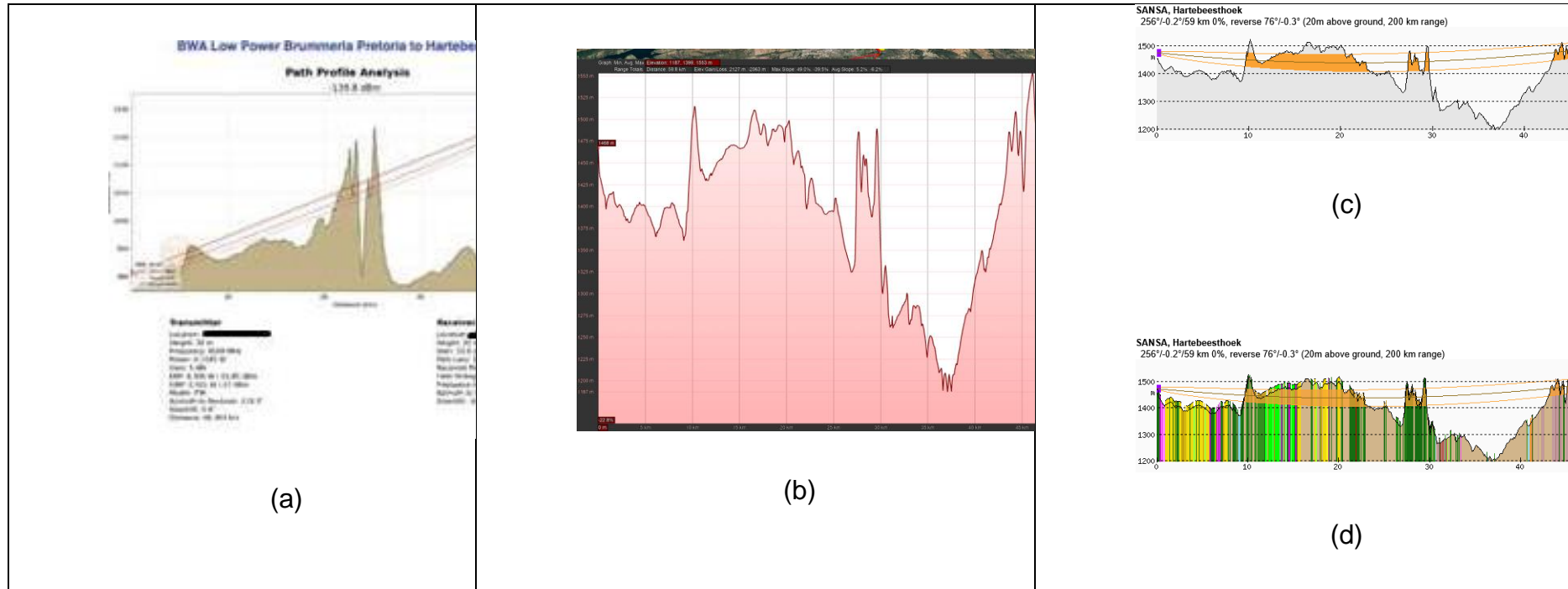


Figure 6: Figure 5: Path profiles from CSIR Brummeria to SANSA, Hartebeesthoek (Distance=59.8 km) (a) ICASA simulation (GG No. 52415,p32, (b) Google Earth Pro (20 May 2025), (c) Fixed Wireless demo (20 May 2025), (d) Fixed Wireless Demo (20 May 2025) with landcover data

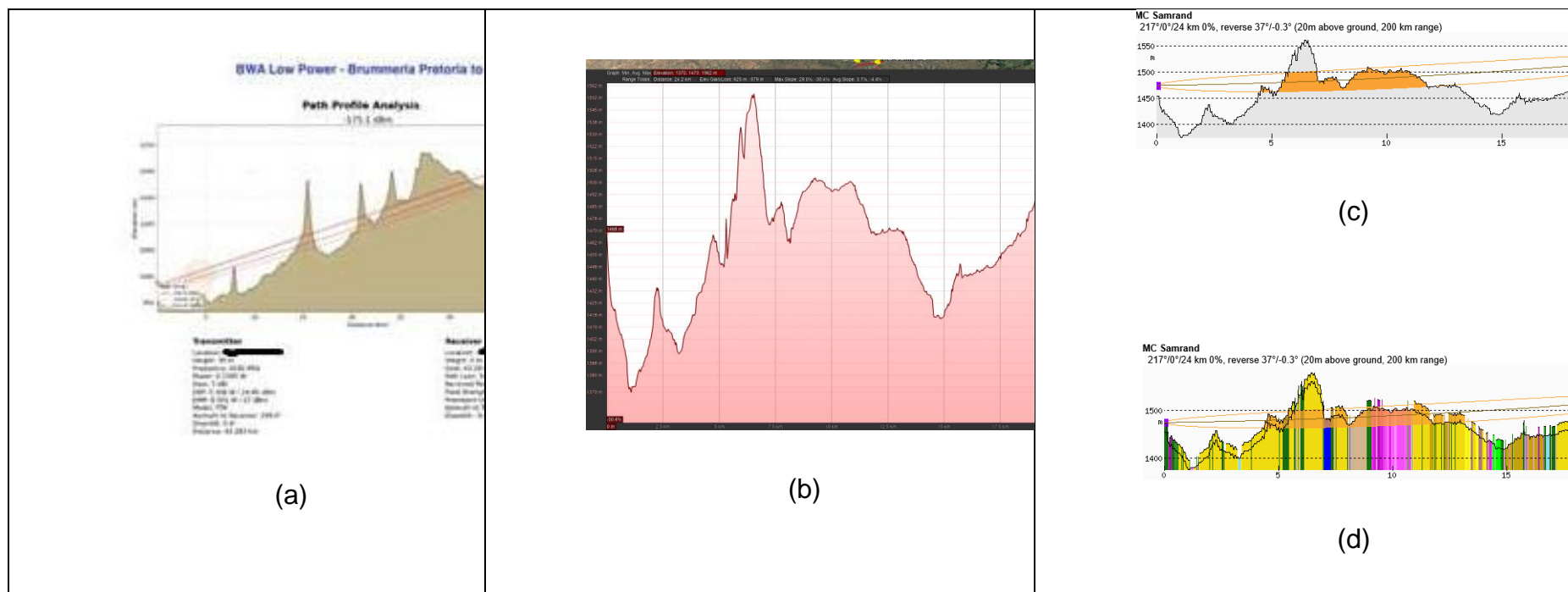


Figure 7: Figure 6: Path profiles from CSIR Brummeria to MC Samrand (distance=24.2 km) (a) ICASA simulation (GG No. 52415,p32, (b) Google Earth Pro (20 May 2025), (c) Fixed Wireless demo (20 May 2025), (d) Fixed Wireless Demo (20 May 2025) with landcover data

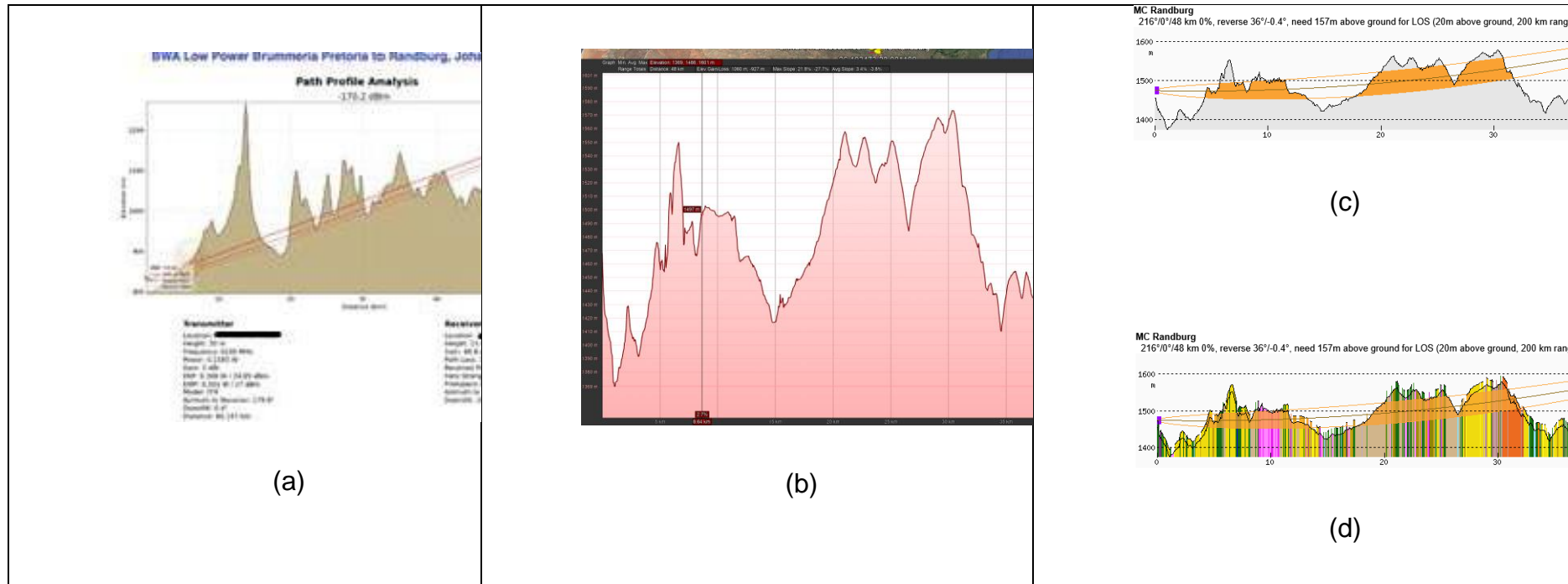


Figure 8: Figure 7: Path profiles from CSIR Brummeria to MC Randburg (distance=48.0 km) (a) ICASA simulation (GG No. 52415,p32, (b) Google Earth Pro (20 May 2025), c) Fixed Wireless demo (20 May 2025), (d) Fixed Wireless Demo (20 May 2025) with landcover data

Figure 9: Table 2: FSS receive points and interference impact of a simulated BWA site at the CSIR

Site Name	Latitude (DD)	Longitude (DD)	Antenna height (m)	Distance (km)	Frequency (GHz)	FSPL (dB)	Tx Power (dBm) (ISFR 2, p16) (CSIR, Brummeria)	Interference power at FSS receive point (FSPL based) (dBm)	Interference power at FSS receive point (FSPL and clutter considered in RTS study) (dBm)	ICASA (LP BWA power at FSS receiver, Table A.1.5a) (dBm)	ICASA (MP BWA power at FSS receiver, Table A.1.5a) (dBm)	Comment
CSIR, Brummeria (BWA TX site)	-25.755519	28.282903	30	0	4.2		36	36.00				Simulated BWA Tx site
SANSA, Hartebeesthoek	-25.88531	27.707454	15	59.8	4.2	140.45	36	-104.45	118.46	-139.5	-128.8	ICASA simulations underestimate interference level
MC Samrand	-25.92925	28.138156	15	24.2	4.2	132.59	36	-96.59	-133.56	-175.1	-164.1	ICASA simulations underestimate interference level
MC Randburg	-26.103473	28.001188	15	48	4.2	138.54	36	-102.54	-108.12	-170.2	-199.2	ICASA simulations underestimate interference level. ICASA result erroneous for MP
MC Randburg	-26.103473	28.001188	15	48	4.2	138.54	27	-111.54	-117.12	-170.2	-199.2	ICASA simulations underestimate interference level. ICASA result erroneous for MP
Sentech, Pretoria	-25.689285	27.983905	15	31	4.2	134.74	36	-98.74	-38.94			Not considered by ICASA
Monitoring point	-25.855397	28.310616	15	11.5	4.2	126.13	36	-90.13	-80.7			Not considered by ICASA
Embassy 1	-25.746124	28.223237	15	6.09	4.2	120.61	36	-84.61	-38.57			Not considered by ICASA

Site Name	Latitude (DD)	Longitude (DD)	Antenna height (m)	Distance (km)	Frequency (GHz)	FSPL (dB)	Tx Power (dBm) (ISFR 2, p16) (CSIR, Brummeria)	Interference power at FSS receive point (FSPL based) (dBm)	Interference power at FSS receive point (FSPL and clutter considered in RTS study) (dBm)	ICASA (LP BWA power at FSS receiver, Table A.1.5a) (dBm)	ICASA (MP BWA power at FSS receiver, Table A.1.5a) (dBm)	Comment
Loftus Versfeld Stadium	-25.753234	28.222939	15	6.04	4.2	120.54	36	-84.54	-55.06			Not considered by ICASA
Embassy 2	-25.761299	28.24748	15	3.61	4.2	116.07	36	-80.07	-20.07			Not considered by ICASA
O.R. Tambo International	-26.137307	28.249935	15	42.7	4.2	137.52	36	-101.52	-120.36			Not considered by ICASA

ANNEXURE B: RTS STUDY: PTP STUDY TECHNICAL REPORT