Annex II – Decisions on Recommendations Matrix for Second Consultation Round

The following summarises the comments and recommendations received from stakeholders to the *Consultative Document on the Authorisation Framework for Accommodation of White Space Radiocommunications Devices (Second Round)* and the decisions made by the Authority have been incorporated in the final approved version, November 2017, where applicable.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
1	General	TTPBA	The TTPBA in general recognizes the Authority's stated objective of establishing frameworks that will allow the persons to maximize their utilization of the spectrum resource.	TATT to provide clarity on a number of issues.	The Authority thanks the TTPBA for its continued participation in the consultation process and for its comments and recommendations. In relation to the comment made by the TTPBA *"...*frameworks that will allow the persons to maximize **their** utilization of the spectrum resource", the Authority wishes to re-emphasise that the *Authorisation Framework for the Accommodation of White Space Radiocommunications Devices* (the Framework) will maximise the utilisation of the available spectrum in the ultra high frequency (UHF)

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			The TTPBA notes TATT's assurances that this framework will not negatively impact the broadcasting sector, however, such assurances would only be given credence by action which reinforces these claims. In that regard TTPBA calls for TATT to publish clarified rules with respect to the use of DTT systems in Trinidad and Tobago.	TATT should review the provisions of this framework so that the policy prescriptions are internally coherent, and in alignment with both its stated objectives and other Authorisation	television (TV) band only. Spectrum currently assigned to free-to-air TV broadcasters and subscription TV broadcasting services providers will not be available for use by WSDs. In relation to the "…clarified rules with respect to the use of DTT systems…", the Authority notes that a meeting will be held with the TTPBA and TV broadcasters before the end of 2017 on the DTT transition process and the relevant rules that will apply, inclusive of the DTT standard and the signal distributor transmission model. The Authority agrees with this recommendation and recognises that the approval of this Framework may result in the need to modify other regulatory instruments. For example, the Trinidad and Tobago Frequency Allocation Table (TTFAT) may need to be revised to include a new TT footnote to refer to this Framework

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			The TTPBA also suggests that TATT review the proposed Authorisation Framework for WSD's as the proposals seem at times internally contradictory, and at odds with TATT's stated objectives and its current procedures. These comments do not necessarily reflect all of the concerns of the TTPBA. The TTPBA reserves the right to raise other matters of import during further stages of the consultative process.	Frameworks published by TATT.	within the 470 – 698 MHz range. Any necessary revisions will be made when these other regulatory instruments are revised in accordance with their respective review cycles.
2	General	Nominet	Nominet strongly supports TATT's regulatory approach to enabling dynamic access to TVWS. This technology is a proven solution for broadband provision in hard-to-reach areas both in rural and		The Authority thanks Nominet for its participation in the consultation process and for its comments and recommendations.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			urban locations, and for the IoT; TATT's regulations make it possible for this technology to provide substantial economic and social benefits to Trinidad & Tobago and its citizens. Nominet believes that TATT's regulations will be held as an exemplar for other governments throughout the Caribbean region, and we applaud TATT for being leaders in this field.		
3	General	TSTT	TSTT appreciates the Authority's consultation on its proposals to introduce a novel way of administrating spectrum via its: *Authorisation Framework for the Accommodation of White Space Devices.* While the proposed framework is broadly consistent with others that	TATT should complete and publish final versions and DoRs of the following outstanding consultation frameworks: - The Authorisation	The Authority thanks TSTT for its participation in the consultation process and for its comments and recommendations. The Authority wishes to clarify the following: 1. The consultation process for the *Authorisation Framework for the Telecommunications and Broadcasting Sectors of Trinidad and Tobago* (the Authorisation

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			are already adopted in other jurisdictions including the USA, UK, Canada and Singapore, TSTT notes that this framework is being proposed while the consultation on other critically related frameworks remain incomplete. Of particular note is the non-completion and non-publication of DoRs on the following: - The Authorisation Framework for the Telecommunications and Broadcasting Sectors of Trinidad and Tobago (2nd Round issued in September of 2014). - The Spectrum Management Regulations (1st Round	Framework for the Telecommunications and Broadcasting Sectors of Trinidad and Tobago (2nd Round issued in September of 2014). - The Spectrum Management Regulations (1st Round issued in March 2015).	Framework) was completed and approved by the Board, with the publication of the revised document pending the approval of the amendments to the Telecommunications Act, Chap. 47:31. 2. The consultation process for the *Proposed Recommendations for Telecommunications (Radio Spectrum) Regulations, 2015* (Spectrum Management Regulations) is complete. Based on the single round of consultation, in accordance with the Authority's consultation procedures, this document has been finalised and will be published on the Authority's website before its submission to the Minister for approval and promulgation in accordance with Section 78 of the Act.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			issued in March 2015). There are provisions within both of these long outstanding consultations which will materially impact the proposals put forth in the subject document. To this end, TSTT believes that there should be a completion of those frameworks so that stakeholders have a clear holistic picture of the regulatory regime being proposed by TATT.		The Authority wishes to advise that the Spectrum Management Regulations are in keeping with the existing regulatory regime, as is this Framework. Hence the approval of the Regulations will not materially impact this Framework. The Framework conforms to the Authorisation Framework. In the event that the Authorisation Framework (or any other regulatory instrument developed or revised pursuant to the approval of this Framework) impacts it, the necessary revision and consultation will be undertaken.
4	General	Columbus Communications Trinidad Limited (CCTL)	CCTL thanks the Authority for the opportunity to provide input in the consultation "Authorisation Framework for the Accommodation of White Space Radiocommunication		The Authority thanks CCTL for its continued participation in the consultation process and for its comments and recommendations.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			Devices." The views expressed herein are not exhaustive. Failure to address any issue in our response, does not in any way indicate acceptance, agreement or relinquishing of CCTL's rights.		
5	General	CCTL	In preparing our response to this document we focus on the Decisions on Recommendations (DORs) accompanying this second stage consultation document. We note that Section 1.7 entitled "Consultation Process" lists the revisions made to the first phase document based on the responses received from the first round of the consultation. These are in	Given the potential impact of these regulatory decisions, on the industry, we implore TATT to fully and meaningfully consider the input from stakeholders.	The Authority wishes to categorically state that it values and considers the comments and recommendations made by all stakeholders. Notwithstanding this, the Authority may not always agree with comments and recommendations made. In such instances, the Authority ensures that a suitable reason is provided to justify the nature of its consideration. Should the reasons stated be unsatisfactory, the Authority welcomes further comments from the stakeholder. Further to this, and based on your comments:

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			the main clarifications rather than substantive changes to TATT's positions articulated in the first round document. Given factors such as (i) the technical nature of the issues under consideration, (ii) the nascent state of WSDs technology (iii) the fact that there was no input from the industry in developing the initial position and (iv) the published DORs show that TATT has maintained its position set out first stage of this process; we question the extent to which final decisions will be informed by the diversity of considered positions from stakeholders. If the outcome of the process is that TATT's initial positions are		1. In relation to the technical nature of the issues under consideration: extensive research was conducted to formulate the rules in the Framework, based on technical considerations by other regulators. 2. The nascent state of the technology: while WSDs are emerging, a regulatory model has been established by other regulators. 3. There was no input from the industry in developing the initial position: the Authority's public consultation process was developed to obtain views of stakeholders, including those of the industry. 4. The published DoRs show that TATT has maintained its position set out in the first stage of this process: revisions to the consultative document are made

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			simply rubber stamped we believe this falls short of what is contemplated by the Act [S18 (4) which speaks to allowing interested parties opportunities for consultation. Given the potential impact of these regulatory decisions, on the industry, we encourage TATT to allow for more meaningful consultations on the issues.		where comments or recommendations received are justifiable and add value in the context of the purpose and objective of the consultative document. Such changes were made based on comments and recommendations received from the first round of consultation and were identified in section 1.7 – Consultation Process of the Framework.
6	1.1 Rationale	CCTL	In addressing the questions around the nature of expressions of interest which precipitated the move to specify rules for White Space Devises (WSDs) at this time, TATT indicates that expressions of interest have come from several parties wishing to use WDSs for various purposes,	Where spectrum is assigned to WSDs to be used in providing public telecommunications service, the rules must be consistent with the principles nondiscrimination.	The Authority wishes to confirm that, in relation to the use of spectrum by WSDs, there is no distinction between private and public use. Therefore, there is no difference in the licensing approach (i.e. the *Class Licensing Regime)* and associated licence fees (i.e. a value of zero.) It should be noted, however, that for public use, a concession and

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			and that incumbents and new commercial users may use WSDs for private or public telecommunications networks. With respect to commercial use, TATT also clarified that where WSDs use spectrum to provide public telecommunications services, they would need to adhere to all relevant regulatory instruments, including obtaining the appropriate concession. Further, that WSDs will be issued based on class licenses and that class license do not attract fees [pg. 56 of DORs]. On this point no distinction was made for private vs. public use. It therefore follows that where spectrum is used to		associated concession fess will apply. The Authority does not agree with CCTL's view that there should be preferential treatment in the use of WSDs for the provision of public telecommunications services. It should be noted that spectrum that attracts a licence fee is assigned exclusively to a single user. A user assigned such spectrum enjoys exclusive access to it, at a licence fee that reflects same. Spectrum that is shared (class licensed) is available under the same terms and conditions of use to any user, e.g. spectrum for Wi-Fi devices. There is no exclusive use for spectrum that is class licensed. For example, Wi-Fi is used for both private and public use under the same terms and conditions and attracts no licence fee. Therefore, it becomes the choice of the user to determine which spectrum, exclusive or shared, is more suitable for its

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			provide public telecommunications service, TATT is proposing that there should be no fee. In response to Digicel on this issue [DORs pg. 18], TATT seems to be suggesting that where WSDs are used to provide telecommunications services the service would be required to pay the fees related to the service concession, but not fees for the use of the spectrum. If free spectrum is provided for WSDs to support the provisioning of public telecommunications services, CCTL views this as preferential treatment. This is clearly contrary to the statement "There shall be no preferential treatment		intended use, be it public or private. Additionally, the Authority views its approach as non-discriminatory, as any public service provider can use the spectrum under the same terms and conditions as any other public or private user. We wish to clarify and draw your attention to the remainder of the Authority's response from the first round DoRs, referred to in your comments: "Such considerations are made via more appropriate frameworks and processes within the Authority's regulatory regime, for example, the Annual Market Report, market assessment, and evaluation of concession applications." The Authority states that the rules for the use of WSDs are the same for public and private use. Also, devices that are class licensed do not attract

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			regarding authorization of WSDs in accordance with Section 18(5) of the Act. Section 18(5) states, *"At all times the Authority shall, in the performance of its functions and exercise of its powers, act in an objective, transparent and non-discriminatory manner."* It would clearly be discriminatory treatment if TATT decides to provide free spectrum to a service provider to compete with other operators that don't enjoy the same advantage. This is among other competition related issues raised in the previous round of consultation. TATT's		any licence fees.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			response is that "… it is not intended for the framework to consider any competition related issues that could arise if commercial applications are being considered. We disagree with this position. It is clearly contrary the Act. TATT must ensure that the rules relating to the licensing of WSDs do not provide unfair advantage to providers using this facility to provide public telecommunications services.		
7	1.2 Purpose	Digicel	We have noted the Authority's comments on its Decision on Recommendations Matrix for the First Consultation Round ("DOR") on this Framework, wherein it	Digicel recommends that there be a section relating to fees that are required for white space in the event that WSDs are used to provide a public service or to operate a	Information related to fees and other requirements for the provision of public services will be found in other relevant referenced documents, such as in the Authorisation Framework and *Telecommunications (Fee)*

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			states that in the event that White Space Devices ("WSDs") are used to provide a public service or to operate a public network, the service provider or network operator will be required to obtain a concession and pay the requisite fee. However, the Framework contains no section relating to the fees payable in respec1t of white space in such an event.	public network. We also recommend that a section be included that is dedicated to terms and conditions of intended use of WSDs at this time.	*Regulations, 2006*. The Framework speaks to the technical and operational terms and conditions for intended WSD use. The *Class Licensing Regime* speaks to the administrative terms and conditions associated with the use of spectrum by WSDs. The terms and conditions for public use of WSDs and associated spectrum can be found in the Concession document and are the same as concessions granted to provide a public telecommunications network and services.
8	1.3 Background	Digicel	We note that white space is unlicensed spectrum.	We recommend that the Authority give consideration to auctioning the white space spectrum for licensed use.	Based on the potential applications of white space in the TV bands, the Authority is of the view that public benefit will be maximised if the assigned spectrum is shared amongst all users.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
					Hence, an auction for white space spectrum would not be applicable, as this spectrum will not be exclusively assigned but shared amongst all users.
9	2 Overview of White Space Devices	CCTL	One the question of potential of interference to hybrid fiber coaxial (HFC) broadband systems, and the need to assess this risk and to ensure that the rules provide for appropriate protection of such systems, TATT's response is that a HFC network operator is responsible for designing its network to protect itself from harmful interference from intentional radiators such as FTA broadcasters and WSDs. We find this response alarming and troubling. CCTL network has been on	We recommend that TATT reconsider proceeding to make rules for the licensing of fixed WSDs at this point. Before moving forward TATT should examine studies that have been done in relation to potential for interference on all incumbent services, including HFC technology. There should be further consultation with affected parties. The results of the assessment and further consultation should be used to inform development of any	The Authority wishes to clarify that its response to CCTL's interference concern from the first round of consultation was also taken in the context of section 18 (1)(g) of the, Telecommunications Act Chap. 47:31 which states, "ensure compliance with the Convention", which, in this instance, is the International Telecommunication Union Radio Regulations. The Convention recognises radiocommunications services/devices in the 470 – 698 MHz frequency range. This results in the need for wired networks to protect their network, as far as practical, noting that they are not recognised by the Convention as

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			the ground for over 10 years. In designing and implementing its system CCTL addressed interference from FTAs. TATT is now making rules to introduce WSDs which are new (emerging technology), and take the position that an existing provider, using proven technology is responsible for protecting its network from harmful interference from new technology being introduced. It is our considered view that this position is contrary to the intentions of the Act. One of the functions and powers of the Authority, [Section 18(1(l)] is to "investigate and resolve all allegations of harmful interference." (S (40) states, "Radio-	rules.	users of the radio frequency spectrum. It is noteworthy that cable TV operators were cognisant of this fact from inception, as their designed network protects against potential harmful interference from the incumbent high powered free-to-air TV broadcasters. Notwithstanding this, the Authority is mindful of section 40 as well. The Authority notes the studies undertaken by the Federal Communications Commission (FCC) in its Second Report and Order and Memorandum Opinion and Order (FCC 08-260, November 14, 2008), based on a concern raised by the National Cable and Telecommunications Association (NCTA) in relation to direct pick-up interference from in-home mobile/portable WSDs on indoor cable connections. The FCC

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			communication equipment shall not be operated in a manner likely to cause harmful interference to any other means of telecommunication". S (65) on offences provides that a person who "operates a station or uses any equipment in such a manner as to cause harmful interference to any telecommunications network or telecommunications or radio-communication service. In addressing harmful interference, S (76) gives the CEO discretion to take steps to address issues of harmful interference. In addition to being contrary to the letter and spirit of the law, this		concluded that its tests did not conclusively confirm harmful interference and recommended that cable TV operators continue to use cable drops, splitters and terminations of high quality and properly installed. The Authority's decision to allow only fixed WSDs at this time will further mitigate potential harmful interference, as it avoids the concern with indoor mobile/portable WSDs. If mobile/portable WSDs are to be allowed in the future, the Authority will consult with all stakeholders, via the revision of this Framework, in accordance with the Authority's consultation procedures.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			position is also contrary to the principle of regulatory certainty. Service providers investing hugh sums in network roll out need confidence in these investments, that they will be safe from unreasonable and or arbitrary changes in regulatory rules. Before moving forward TATT should examine studies that have been done in relation to potential for interference on all incumbent services, including HFC technology. There should be further consultation with affected parties. The results of the assessment and further consultation should be used to inform development of any rules.		

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
10	2.1.3 Geo-location Databases and Exchanges with White Space Devices	Digicel	The Authority has indicated in its DORs that the Geo-location Database will be updated on an ad hoc basis; we ask that this be included in this section. We also note that the polling period has not been defined for Trinidad and Tobago despite references being made to those of Singapore and the UK.	We recommend the inclusion in this section of the fact that the Geo-location Database will be updated on an ad hoc basis. We recommend that the polling period that will be used for Trinidad and Tobago be included in this section.	Section 2.1.3 is a review of how geolocation databases function in the jurisdictions researched. The approaches to be adopted in Trinidad and Tobago are stated in section 3. The approach to be adopted in Trinidad and Tobago, with respect to providing updates to geolocation database administrators on the list of available channels, associated power limits and channel validity, is stated in section 3.5 of the Framework. Similarly, the polling period to be used in Trinidad and Tobago is stated in section 3.3.2 as once every 24 hours.
11	2.1.4 Administration of Geo-location	Digicel	We note in the Authority's DORs that there is to be non-discriminatory use of WSDs and as a	We ask that this section be modified to clearly indicate that Trinidad and Tobago will not be	All of section 2 including section 2.1.4 is a review of the rules for the deployment of WSDs in selected jurisdictions.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
	Database		consequence, priority access will not be allowed. However, the Framework has not been updated to reflect this.	following other jurisdictions regarding priority use.	However, a rule was added in section 3.1 indicating that WSDs will not be given exclusive access to any available channel.
12	2.2.1 Television White Space Band	TTPBA	TTPBA notes that the Authority identifies spectrum resources not in use by traditional television broadcast market for use in the White Space Devices (WSD) framework. However, the TTPBA also notes that TATT has failed to crystallize this assurance through the publication of a spectrum plan identifying: i. assigned and unassigned spectrum in these bands,	The Authority needs to publish a spectrum plan identifying: i. assigned and unassigned spectrum in these bands, ii. spectrum to be allocated for the deployment of OTT services iii. iii) spectrum to be co-allocated to WSD's.	The protection of incumbent TV broadcasting service is of utmost importance to the Authority in respect of the deployment of WSDs in Trinidad and Tobago. It is noted that WSDs are designed to operate in adherence to this objective. The Authority is fully aware that this protection has to be afforded when WSDs are introduced during the DTT transition and after the switch-over has been completed. A spectrum plan is typically required where frequencies are either spectrum or station licensed. In this case, it is proposed that WSDs be used under a class licence.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			ii. spectrum to be allocated for the deployment of OTT services iii. spectrum to be co-allocated to WSD's. The TPBA takes the opportunity to remind TATT that the implementation plan for DTT involved to simultaneous broadcasting of analogue and digital signals. In this regard, whether there was to be the use of Signal Distributers (as initially proposed by TATT) or complementary digital spectrum offered to each television broadcaster, there would need to be clarity of what spectrum will be used for this		Consequently, the Authority will list the available channels in the TV band that can be used by WSDs and associated maximum technical operating parameters in Schedule B of the *Schedule of Devices Eligible for Use under a Class Licensed Devices.* The Authority does not plan to allocate spectrum to OTT services as this is not a radio or radiocommunications service. In Rule 19, the Framework indicates that WSDs will not be allowed to operate on (i.e. co-allocated on) channels assigned to authorised digital and analogue free-to-air TV broadcasters. Further to this, Rules 21 and 22 indicate the maximum technical parameters for the channels that will be made available to WSDs, which will prevent harmful interference to TV broadcasting

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			initiative, so that there is a clear understanding of what spectrum will be assigned to WSD's. The TTPBA eagerly awaits TATT's assessment of the ATSC3.0 launch and the economic viability of the Signal Distributor model. In that context, and given the interdependencies of that framework with the one under review, the TTPBA believes that TATT should finailse its position on DTT before moving forward on WSD's.		services. In section 3.5.1, the Authority will list the available channels in the TV band and associated maximum operating technical parameters in *Schedule B of the Schedule of Devices Eligible for Use under a Class Licence*. This will be completed and published along with the final approved version of the Framework. The Authority is cognisant that the implementation of DTT may result in changes to the channels available to WSDs. In section 3.5.1, it states "the Authority will update the list of available channels, associated power limits and the channel validity period as the channels available to WSDs change." The Authority shall update the *Schedule of Devices Eligible for Use under a Class Licence Devices* to reflect such changes as required and the database administrators will

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
					effect such changes accordingly. The above indicates that preference to available spectrum will be given to the primary and secondary radiocommunications services in the 470 – 698 MHz range. In relation to the implementation of DTT, the Authority plans to meet with the TTPBA and broadcasters on the assessment of the ATSC3.0 launch and the economic viability of the signal distributor model, in October 2017. Notwithstanding this, the use of spectrum by WSDs is not dependant on the timeframes of DTT, as WSDs can be assigned spectrum without impairment to the implementation process of DTT.
13	2.2.2 The 3.6 GHz Band	Digicel	We note this section regarding the the 3.6 Ghz band; however, despite the Authority's comments in its DORs that the 3.6 Ghz band is, not at this time, to be	We ask that the Authority clearly state in this Framework that the 3.6 Ghz band will not be used, at this time, for WSDs or we ask that this	The Authority wishes to clarify that this section forms part of the literature review of the Framework. The rules for Trinidad and Tobago are stated in section 3.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			allocated for white space in Trinidad and Tobago, the Framework does not clearly state this.	section be removed in its entirety.	The 3.6 GHz band is not allowed for use by WSDs in Trinidad and Tobago. This is confirmed in Rule 1 which states: *WSD operations shall **only** be allowed on selected channels, prescribed by the Authority, in the UHF television broadcasting band—470-698 MHz.* Therefore, further to section 2.2.2, there is no reason to refer to the 3.6 GHz band.
14	2.3.2 Licence Shared Access	Digicel	We note from the Authority's DORs that licence share arrangements are not permitted under the Authority's current regulatory regime; however, this is not clearly stated in the Framework.	We ask that the Authority include in the Framework a statement that licence share is currently not permitted.	The Authority wishes to clarify that this section forms part of the literature review of the Framework. Rules for Trinidad and Tobago are stated in section 3. The licensed shared access approach to authorising WSDs' use of spectrum is not the approach adopted in Trinidad and Tobago. This is confirmed in Rule 33, which states:

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
					All white space radiocommunications devices shall be authorised in accordance with the Class Licensing Regime. Therefore, further to section 2.3.2, there is no reason to refer to licence shared access.
15	3 Framework for Authorization of White Space Radio Communication Devices	CCTL	CCTL reiterates its question concerning the haste to make rules on the use of WSDs. In addressing the issue of TV White Spaces, the GSMA in its publication "Mobile Public Policy Handbook – An Insider's Guide to the Issues 2017" makes the point that even in the most developed markets the technology in WSDs is not proven. GSMA also put forward the view that the licensing of WSDs should not disrupt the use of digital	We recommend that TATT reconsider proceeding with making decisions on the rules at this point. The industry would be better served if TATT involves the industry in more detailed assessment of all the related issues including potential implications for the digital switch over project before proceeding with these rules.	Whilst the Authority respects CCTL's considered view that the Authority is making rules on WSDs in haste, there are established rules for WSDs in several developed countries, as cited in section 2. It should be noted that the Authority started the consultation process with an ICT open forum and completed two rounds of consultation. The first round was for the typical four weeks and the second was originally scheduled for four weeks and was extended to six weeks based on stakeholder requests. The Authority also considers

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			dividend for mobile broadband applications. In responding to questions raised by several respondents to stage 1 of the consultation, regarding the reason for focusing on fixed applications as opposed to mobile LTE applications, TATT notes that this conservative approach is to some extent related to the need to protect existing broadcast services. In discussing the impact of the pending analogue to		GSMA's view to be partial to mobile broadband development. WSDs can assist in closing the broadband gap. This can be seen by pilot projects in developing countries, such as the Jamaica Connected Nation Project[1]and the University of Limpopo TVWS Trial[2]. The Authority wishes to clarify that its intention to allow only fixed WSDs as opposed to mobile WSDs is a conservative approach to protect the TV broadcasting service. The Authority also wishes to clarify the only changes that may be required during the analogue to digital switchover process will be the channels assigned to WSDs and their

[1] http://dynamicspectrumalliance.org/wp-content/uploads/2015/07/JamaicaTVWSLearnMorePDF.pdf

[2] https://www.ul.ac.za/index.php?Entity=c_news&TheS=150

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			digital switch over for broadcast services TATT indicates that this initial set of proposed rules for the licensing of WSDs will have to be changed to accommodate the spectrum requirements of the digital switchover process. Based on the above, CCTL is of the considered view that making rules on licensing of WSDs at this juncture is premature. The industry would be better served if TATT involves the industry in more detailed assessment of before proceeding with these rules. In any event these rules will have to be revisited with the pending digital switch over project. This really begs the question of the undue haste		associated maximum permissible power and not the rules in the Framework. The use of spectrum by WSDs is not dependant on the timeframes of DTT, as WSDs can be assigned spectrum without impairment to the implementation process of DTT. The Authority is of the view that the potential benefits of the use of WSDs and the fact that there are established rules already employed in other jurisdictions warrant the development of rules for Trinidad and Tobago.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			at this point.		
16	3.1 Frequency Bands	Digicel	Digicel suggests that the Framework should clearly state that if a new channel is assigned to a broadcaster, it will be removed from the WSDs list and all WSDs shall cease operations on that channel within 24 hours, in accordance with Rule 15.	We recommend that a clear statement be included regarding assignment of new channels to broadcasters and how this will affect existing WSDs	The Authority wishes to confirm that your comment and recommendation are addressed in Rule 19. Any new channel assignments to primary or secondary radiocommunications services in the band 470 – 698 MHz will be removed from the list of available channels for use by WSDs.
17	3.1 Frequency Bands	TSTT	TATT's Draft Authorisation Regulations proposes to adopt rules for licence-exempt use of the frequencies between 470-698MHz (Band IV & Band V). TATT argues in the consultative document that "because of the high utilization of the channels in the Very High Frequency (VHF) TV band", that the VHF bands are excluded.	TATT should extend its framework to allow licence-exempt use of VHF spectrum as well.	Whilst the Authority notes TSTT's recommendation, reference is made to section 3.1, which states that "WSD operations will be limited to selected channels in the Ultra High Frequency (UHF) TV band, 470 – 698 MHz, **because of the high utilisation of the channels in the Very High Frequency (VHF) TV band**." After the implementation of DTT, when additional spectrum in the VHF band becomes available, the Authority can consider this

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			The same methods used to protect broadcasters in the UHF band can also protect VHF spectrum users. As a result, implementing this addition should be straightforward and could free up significant additional spectrum contiguous to the UHF band.		recommendation as a revision to the Framework.
18	3.2 White Space Access Mechanism	Carlson Wireless (CWT)/ Tide Wind Energy (TWE)	CWT believes that, unlike other countries, Trinidad and Tobago can and should take advantage of the fact that it has a less complex TV broadcasting coverage market. While other countries such as the U.S., Canada, and the U.K. have adopted an independent database approach, they did so because their countries include many different TV		The Authority thanks CWT and TWE for their participation in the consultation process and for their comments and recommendations. The Authority agrees with CWT's view that the TV broadcasting coverage market is not as complex as that of the larger, more developed jurisdictions. This fact is reflected in the Framework, hence the significant difference in the approach in the use of the UHF band by WSDs, and in particular, the approach to

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			markets where the availability of TVWS channels may be very different and inconsistent from one market to the next. In addition, in those countries, some markets have many operating TV stations and few available channels, while other markets have a completely different set of available TVWS channels and operating TV stations. From the perspective of TVWS regulation, Trinidad and Tobago has the advantage of essentially being one TV station market with several operating TV stations but with many UHF TV channels unused and available for TVWS		determining channel availability and other operational parameters and the responsibilities of the database administrator. The Authority, however, disagrees with CWT's view that restricting WSDs to unassigned channels at reasonable power limits with no geolocation database is sufficient for Trinidad and Tobago. The geolocation database plays a significant role in managing the operation of WSDs in accordance with the Framework. In particular, the geolocation database ensures WSDs operate in accordance with the technical and operational limits necessary to protect primary and secondary radiocommunications services in the UHF TV band. Also, the geolocation database ensures only devices that are certified and registered with the Authority can use TVWS. Furthermore, the geolocation

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			deployment.4 Specifically, there appear to be no more than ten UHF TV broadcasting station in operation in the UHF band of 38 channels.5 Therefore, if the Trinidad and Tobago regulations were to simply provide that no TVWS may operate on any of the ten TV station channels anywhere in the country, there would remain 28 available UHF channels for TVWS deployment, which is ample.6 That approach, in combination with reasonable power limit safeguards CWT proposes below, would obviate the need for an independent TV white space database for Trinidad and Tobago. This, in turn, would lower the expense of deployment of a		database ensures channels that are no longer available to WSDs are cleared within 24 hours. The Authority will be ready to approve geolocation databases in Trinidad and Tobago when the final approved version of the Framework is published.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			TV white space network7 and the delay and expense associated with regulatory approval of one or more TVWS database administrators. This delay and cost to the public good could be significant. In Canada, for example, the regulator adopted TVWS database regulations in February 2015,8 but the first database administrator did not even apply for regulatory approval until this month.9 This two-year or more delay has significantly impeded the use of TVWS-based broadband in Canada. That delay in Trinidad and Tobago is counterproductive to the government's goals of enhancing broadband		

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			connectivity for its people.		
19	3.3.1 Categories of Devices	Carlson Wireless/ Tide Wind Energy	CWT believes that it is unnecessary to require fixed-only TVWS devices, as proposed in the First Round TVWS Proposals, Sec. 3.3.1 (page 15). Mobile or nomadic operation of TVWS devices on Trinidad and Tobago would present no material interference to operating TV broadcasters so long as there are appropriate adjacent channel technical TVWS device limits, as recommended above. Other countries have not restricted TVWS operations to fixed-only and allow mobile or "personal portable" TVWS devices to operate under more restrictive technical power limits. Those higher		The operations of WSDs in the TV broadcasting band pose a risk of harmful interference to the TV broadcasting service. Mobile WSDs pose a greater risk of causing harmful interference and there is not sufficient literature of successfully implemented mechanisms or rules to manage the operations of mobile WSDs n to prevent harmful interference to the TV broadcasting service. Even greater caution will be required as Trinidad and Tobago has not begun its analogue to digital switchover process.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			limits on mobile devices are only appropriate in those countries, however, because a mobile device in those countries might travel from one TV market to another market with different TV operations environments. That is not the case, however, in Trinidad and Tobago where there is no issue of multiple TV market environments and possible interference if a TVWS device operating on a channel appropriate for one TV market were to travel to another market where that same TVWS channel is not available. Instead, for the reasons stated above, Trinidad and Tobago has a single market and has proposed no TVWS on the operating TV broadcasting		

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			channels. This gives Trinidad and Tobago an advantage relative to other countries by allowing it to encourage the deployment of mobile TVWS devices. While most TVWS devices are today marketed as fixed, that is a consequence of the regulatory restrictions imposed on mobile TVWS devises in other multi-market countries such as the U.S. CWT's TVWS devices, however, have no technical limitation that would prevent an ISP from offering TVWS-based mobile broadband services. Given that many people of Trinidad and Tobago may not be able to afford both mobile devices and home-based fixed devices, such as laptops, permitting ISPs the		

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			flexibility to offer mobile and/or fixed services would serve the public good for the people of Trinidad and Tobago with no offsetting burdens.		
20	3.3.3 Security Requirements	Digicel	There is no reference in the Framework to security mechanisms that would be considered for use by WSDs.	We ask that the Authority provide reference to security mechanisms that are being considered for by WSDs, even though these may eventually change.	As indicated in the Decisions on Recommendations (DoRs) for the first round of public consultation, the Authority's focus, as it relates to security requirements, was not on the specific protocols and standards currently used in the industry. The Framework focuses on the requirements of the security mechanisms, as reflected in Rules 18 and 26. Referencing specific security mechanisms may limit the consideration of possible mechanisms that can be employed. The Authority prefers that the database administrators and users of

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
					WSDs demonstrate that their databases and WSDs respectively, have met the security requirements identified in the Framework. Therefore, it will not be necessary to reference any specific security mechanism in the Framework.
21	3.4 Coexistence of Services	Nominet	An analysis of the expected channel availability for TVWS operation under the proposed rules was not provided. Such an analysis would be extremely useful, both in enabling the market to understand the real potential of TVWS in Trinidad & Tobago, and in helping the Authority to fine-tune the framework so to maximise the benefit to citizens while ensuring no harmful interference to incumbents. Nominet would be pleased to engage in further discussions with TATT and		The Authority notes Nominet's comment on the analysis of the expected channel availability for TVWS operations. While such analysis may be beneficial in larger jurisdictions, where channel availability varies between service areas, Trinidad and Tobago forms a single service area and channel availability is only based on the fairly static frequency assignments to free-to-air TV broadcasters. Therefore, the approach taken by the Authority was to consult on the development of the technical parameters in the Framework. Subsequent to the approval of the Framework, the

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			to use our specialised tools for the numerical analysis of TVWS availability.		channel availability, i.e. the channels that can be assigned, will be published, along with the final approved version of the Framework. The above approach was selected to maximise the protection to existing primary and secondary radiocommunications services in the band.
				We recommend that the wording of the technical limits presented in Rules 21 and 22 should be more clear. Each of the (c) points in Rules 21 and 22 should explicitly state that the power limits apply to the out-of-band conducted power limit over 100kHz, as we believe is the intent (i.e. matching the FCC power limits). Furthermore, the (b) points establish a maximum antenna gain but omit the 1dB/dBi	The Authority appreciates this feedback, accepts the recommendations and has revised the relevant sections.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
				reduction rule from Tables 3 and 4.	
22	3.4 Coexistence of Services	Carlson Wireless/ Tide Wind Energy	CWT believes it is correct to adopt reasonable technical limits on TVWS devices operating on channels adjacent to operating TV stations in order to avoid interference to operating TV stations. The technical limits proposed in Section 3.4, however, are somewhat excessive and would impede the use of TVWS on Trinidad and Tobago with no offsetting benefit to TV viewers. We recommend less stringent rules, consistent with those adopted by other countries, to better serve the country's goals of broadband deployment while also prevent material		The Authority considered the use of FCC's rules in CFR Title 47 Part 15 Subpath H, Sections 15.709 – 15.712. However, these rules cannot be adopted in Trinidad and Tobago in their entirety. These rules, especially those in 15.712, are applicable in jurisdictions with a large geographic area that can employ multiple markets [services areas]. Trinidad and Tobago employs a single service area for the twin-island state. The Authority acknowledges your alternative recommendation, to adopt the limits proposed in Table 4 (formerly Table 3 of the first consultative document) for use of channels adjacent to both analogue and digital TV broadcasters. However, these limits cannot be used for WSD operations on channels adjacent to digital TV broadcasting

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			interference to operating TV stations. Specifically, we recommend that Trinidad and Tobago adopt the same technical parameters as have been adapted by the U.S. FCC in FCC Rule Sections 15.709 to 15.712.10 These rules have been in place for years and, to date, there is not a single example shown of TVWS device interference with a U.S. TV broadcaster. Alternatively, CWT would recommend adoption of the adjacent channel limits proposed in Table 3 of the First Round TVWS Proposals (page 19) for channels adjacent to the channels of both analogue and digital TV		services. More stringent limits are required to protect the digital TV broadcasting service, as digital receivers have a lower receive threshold compared to analogue receivers but offer no improvement in adjacent channel rejection ratio (ACRR) when compared to analogue receivers.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			broadcasters.		
23	3.5 Rule 25	Nominet	We would welcome more information about the process required so that Geolocation Database operators can supply operational parameters only to registered WSDs. For example, would the Authority notify Geo-location Database providers the list of registered WSDs?		The Authority will provide database administrators with a list of registered WSDs, as is stated in section 3.5.1. This list will include the serial number of the registered WSDs.
24	3.5 Rule 29	Nominet	We would welcome more details about the process to approve and operate a Geolocation Database.		The process for approval of geolocation databases will be published along with the final approved version of the Framework.
25	3.5.2 Approval of Geo-location Database	Digicel	We note from the Authority's DORs that communication between Geo-location Databases is not a requirement for WSDs, however, we consider it essential in order to ensure the most efficient	We ask that the Authority conduct the necessary research regarding communication between Geo-location Databases and consequently recommend the communication	Based on the rules of the Framework, there will be three categories of information stored on geolocation databases, related to the: i. operational parameters. ii. devices registered with the

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			use of channels. We note from the Authority's DORs that multiple WSDs may access the same channels simultaneously, however, Digicel is of the opinion that there should be some limits enforced to protect the quality of service over the channel.	protocol to be followed.	Authority. iii. WSDs to which services are provided. Categories i and ii will be provided to geolocation databases by the Authority. There will, therefore, be no reason for geolocation databases to exchange this information with each other. Category iii may include device and channel usage parameters of all WSDs that used the services of the geolocation databases. This information is proprietary to the geolocation databases, based on the competitive services provided. The Authority will have access to this information for interference management. For these reasons, the Authority does not require geolocation databases to communicate with each other.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
				Digicel recommends that limits be placed on the assignment of the same channel to multiple WSDs.	WSDs are meant to operate in an environment where spectrum in shared amongst all users. This is the approach in all jurisdictions that have authorised WSD use and this approach has been adopted by the Authority via its *Class Licensing Regime*. This is a similar approach taken for other radiocommunications devices such as Wi-Fi devices. To limit the use of channels by WSDs will contradict this fundamental principle of spectrum use. Therefore, it will be incumbent upon the user to consider an appropriate network design when using WSDs in order to meet its quality of service requirement.
26	3.5.2 Approval of Geo-location	TTPBA	TTPBA notes TATT's suggestion that this approval will be carried out under its equipment	TATT should clarify why it is seeking to regulate the operation of GLD's as proposed. What is the	Geolocation databases are established to manage the technical operating parameters of WSDs, which is fundamental to the implementation of

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
	Database "…The Authority can authorise one or more public and/or private sector entities to develop and manage Geo-location Databases in Trinidad and Tobago."		certification procedures. Howver, TTPBA remains unconvinced that this approach is consistent with the law. TTPBA further cites TATT's Certification Procedures document: ***"5.2 What equipment must be certified?*** *In general, all terminal equipment (as defined by the Act) or other equipment to be installed or used for a public telecommunications network or telecommunications service or broadcasting service*	economic risk? What is the operational risk?	this technology using this access mechanism. The geolocation database ensures WSDs operate in accordance with technical and operational limits necessary to protect primary and secondary radiocommunications services in this UHF TV band. The Authority has elected to utilise the geolocation database as the means of managing the use of spectrum by WSDs. Hence, the Authority has opted to enter into a contractual agreement with geolocation databases, in fulfilment of its mandate under sections 18 (i) of the Act. This was considered as the most efficient mechanism of ensuring the primary and secondary services are protected from interference that may be caused by WSDs. This approach is consistent with other regulators, such as the FCC and Ofcom, in the

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			must be certified by the Authority." A Geo-Location Database does not meet the definition of "terminal equipment" as defined by the Act. Indeed, as a database and not a part of a telecommunications network, a GLD seems expressly outside of the regulatory remit of TATT under the Act. As such, the Certification Procedures do not currently, and probably could not ever, provide the necessary coverage to facilitate TATT "authorizing" GLD's as proposed. The TTPBA questions, why would TATT need to authorize such service	Further even if there is a justification for regulating GLD's, the proposed approach is *ultra vires* the Act, and in direct contradiction of TATT's ***Equipment Standardisation and Certification Procedures***. The TTPBA believes the GLD should not be subject to regulation by TATT as TATT already	treatment of geolocation databases and WSDs. The approval process will be "first come, first served." Therefore, all geolocation databases that meet the requirements, in accordance with the Framework, shall be approved. The Authority wishes to clarify that the approval of geolocation databases will not be carried out under the Equipment Standardisation and Certification Procedure for the Telecommunications and Broadcasting Sectors of Trinidad and Tobago. Section 3.5.2 of the Framework has been amended to clarify same. The approval of geolocation databases will be a separate process, the procedures for which will be published by the Authority subsequent to the publication of the final approved

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			providers at all? If TATT is: i. determining the spectrum bands that will be able to be used for WSD's, ii. controlling the usage specifications of the WSD's, and also iii. publishing the information to be used by the GLD's, then TATT has significant control of this area of activity. TATT has not made a case for seeking to further regulate who gets into the GLD business. As a statutory entity, TATT is constrained to operating within the parameters of enabling laws. This proposed action is not	has significant control over the inputs to the business that mitigates against this regulatory over-reach.	version of the Framework. Please note that WSDs will be certified in accordance with the Equipment Standardisation and Certification Framework for the Telecommunications and Broadcasting Sectors of Trinidad and Tobago.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			within those parameters, and the TTPBA believes it shouldn't be. As to broaden its oversight into software services in this way would unduly expand TATT's scope of regulatory oversight in a way that is overly restrictive to market development. TATT should restrain itself from pursuing approaches of regulatory over-reach which will do little more than slow innovation and development of the sector.		
27	3.5.2 Approval of Geo-Location Database	TSTT	TSTT notes with alarm TATT's proposal to "authorise" a class of person that it is not afforded such power under the Act. In this regard we refer to the Geo Location Database	TATT must withdraw the proposal to seek to authorise GLDO's outside the statutory powers afforded it under the Act.	The Authority wishes to clarify that it will not be authorising geolocation database administrators but, rather, will approve private or public sector entities who successfully demonstrate that their geolocation database is capable of providing the services identified in section 3.5.1 of the

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			Operator (GLDO), discussed in this section. From TSTT's understanding, the GLDO does not provide a telecoms service, more so a public telecoms service. Further, the GLDO does not utilise spectrum, or public numbers. The GLDO does not even utilise equipment that needs type approval. The GLDO – as its name connotes – is an information service and the closest thing it can be classified as under the Act is a value added service – which is explicitly identified as outside of TATT's remit in the Act. TSTT is taken aback by TATT's attempt to seek to broaden its regulatory oversight to database or	Instead of seeking to breach the provisions of the Act, it would be better if TATT were to licence the spectrum to operators and let them benefit from the Digital Dividend to provide broader ISP services to our customers.	Framework. The Authority thinks it is necessary to approve such entities, given the importance of geolocation databases in ensuring WSDs operate in accordance with the technical and operational limits necessary to protect primary and secondary radiocommunications services in this UHF TV band. The Authority refers TSTT to the response given in Decision 26. In this decision, an explanation was given for the decision to enter into a contractual agreement with geolocation database, administrators in fulfilment of the Authority's mandate under section 18 (i) of the Act. Furthermore, in order to maximise the benefit of this spectrum, as seen

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			online services. This is against the best practice in the global telecoms space, and is contradictory to any provision or suggestion in any Authorisation Framework proposed by TATT. TATT should withdraw this proposal. Of even greater concern is the fact that TATT has not made the case as to why this extra-judicial step is proposed. It has not defined the economic market failure it is seeking to mitigate against, nor has it identified the risk to the telecommunications resources that it is seeking to control. From TATT's own proposals, the GLDO needs to get updates from		in the approach by other jurisdiction, spectrum used by WSDs are class licensed (i.e. licence exempt) for any interested party to use and not limited to the provision of public telecommunications service.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			TATT which it would (process? and) pass on to WSD customers. If TATT is the source of the information – why is there a need to restrict who gets into the business of GLDO? This proposal must be withdrawn.		
28	3.6 Types of Networks that employ White Space Devices	TSTT	TSTT believes that despite TATT's objectives, there seems to be inconsistencies with the framework proposed, when considered in the context of the wider telecommunications regulatory regime. As a point of example, TSTT notes that TATT proposes that the WSD's be part of TATT's Class Licence regime, where the spectrum user is NOT	TSTT believes that the way forward in this regard is to either: i. Limit the use of WSD's to end user devices, like other equipment identified by the Class Licence regime, and by doing so, preclude the use of the technology in commercial service provision to the public; or	Firstly, the Authority wishes to confirm that any spectrum user wishing to use WSDs in the provision of a public service will be required to meet all the obligations identified in the concession, which includes Schedule F—Quality of Service Requirements for Trinidad and Tobago. Such a spectrum user would then need to design a network using these devices to ensure compliance with the terms and conditions of the

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			protected from interference. However, TATT is also suggesting to stakeholders that the spectrum may be used to provide public telecoms services (i.e. Internet services) to rural "and underserved" communities. This raises the question: as the spectrum is not protected from interference, and interference could materially impact the quality of service received by the customer, does the person who utilise this spectrum get some sort of exemption from Schedule F of the Concession? As TATT would recall, Schedule F provides technical quality of service obligations on providers of	ii. Licence the WSD spectrum band so that the spectrum receives the necessary protections from interference to facilitate the commercial use for the provision of service to the public in accordance with Concession conditions.	concession. Wi-Fi devices are a current example of devices employed in the provision of public telecommunications services and are class licensed by the Authority. WSDs' use of a shared band is very similar to the operations of Wi-Fi devices. These service providers are not exempted from the requirements of Schedule F. In respect of your recommendations, the Authority is unable to consider the recommendations for the following reasons: a. For recommendation i, limiting the WSDs to end-user devices will not be possible as these devices are currently deployed to extend the back haul reach to an access network for both private and public telecommunications networks. b. For recommendation ii, limiting

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			telecoms services. If the spectrum used to provide the service is subject to interference, one of two things will arise: (i) The operator will be consistently in breach of the Schedule F of their Concession and will be subject to penalties under the Act for this breach; or (ii) The operator will be required to roll out significantly more points of presence in an attempt to raise the received quality of service to meet Schedule F requirements. While TSTT notes the interest of a global ICT vendor in the use of WSD's, TSTT would like visibility		use of WSDs to commercial use of licensed users, will not maximise the public benefit to be derived from the technology. In specific relation to "receiving necessary protections from [harmful] interference to facilitate commercial use", please note that spectrum assigned to WSDs will not be assigned to the primary and secondary services in the band. Additionally, these devices employ interference mitigation techniques that allow sharing of the assigned spectrum with other WSDs. The above is expected to mitigate the probability of harmful interference to WSDs.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			of the model mentioned in the DoRs by that vendor with a view to ensuring that the proposals are consistent with the operating requirements of ISP's in Trinidad and Tobago, and whether the model's outputs still show as favourable under the enhanced performance requirements. TSTT further notes, and reminds TATT, that to exempt any one operator from the requirements of Schedule F would be ultra vires the Act, unless similar exemptions are offered to all other ISP's.		
29	3.7 Licensing of White Space Devices	TTPBA	This section seems at odds with TATT's existing published procedures and practices.	TATT needs to clarify which approach it is adopting. The TTPBA prefers the	The Authority wishes to clarify that the registration of WSDs is consistent with the *Class Licensing Regime*, which is the proposed licensing approach. Registration of certain

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			Of note, this section seems to initially follows on the earlier position that WSD's would be operated under a Class Licence Regime and certified under the Equipment Standardization and Certification Framework which requires the type approval of terminal equipment. However, this section then seeks to go on to require each WSD to be registered with TATT at installation. This is more akin to a strict licensing regime, which is inconsistent with a Class Licence framework proposed by TATT. As an example, as TTPBA understands the existing framework, WiFi devices and remote control devices	Class Licence regime, bolstered by the equipment certification process. Any other approach would impractical and defeat the purpose of the framework.	categories of devices is a requirement of the *Class Licensing Regime*, as stated in section 3.4 of the Regime, which can be found on the Authority's website. Further to this, in the *Schedule of Devices Eligible for Use under a Class Licence*, the Authority has identified the specific types of devices and categories of use for which registration is required, as identified in column three of this schedule. For example, Wi-Fi access points used to provide public hotspots require registration with the Authority. This registration process is in effect and the Authority has received registration documents for a number of Wi-Fi devices used for public hotspots. In the case of WSDs, registration allows the Authority to uniquely

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			(TV, gates, car alarms etc.) are all subject to the Class Licence regime bolstered by the equipment certification process. These items are not required to be registered with TATT and geographic position reported. Has this system of administration failed? Has it not resulted in the widespread rollout of WiFi hotspots (and the use of convenient remote devices) with minimal regulatory transaction costs and delays? Why should the WSD's that can access the Geo Location Databases be registered by TATT, as once they operate in accordance with the certification specs, there should be no interference.		identify each WSD and its user (name and contact information). This information will be used: i. to ensure that the spectrum assigned to WSDs are used only by certified devices. ii. in the unlikely event the Authority has to resolve cases of harmful interference between WSDs and primary and secondary services in the band.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			TATT needs to clarify the rationale of overlaying a Strict Registration process on top of a Class Licence Regime. The regulatory approaches seem contradictory.		
30	3.7 Licensing of White Space Devices	TSTT	TSTT is further confused by the proposal that WSDs would be required to register the location of deployment with TATT before operation, given that the proposals are for WSD's to operate under the Class Licence regime. The requirement to make Class Licence users register the location of deployment is inconsistent with TATT's Authorisation Framework, its Equipment Standardisation Framework (for the type approval of	TSTT believes that TATT must identify a clear niche for WSD's. - If the intention is for commercial use by concessionaires in the provision of last-mile service to customers, the spectrum should be subject to station or spectrum licences, in accordance with the Spectrum Management Policy, and the outstanding Spectrum Regulations. - If the spectrum is not to be used for the	The Authority wishes to clarify that the registration of WSDs is consistent with the *Class Licensing Regime*, which is the proposed licensing approach. Registration of certain categories of devices is a requirement of the *Class Licensing Regime*, as stated in section 3.4 of the Regime, which can be found on the Authority's website. Based on the above, the Authority believes that TSTT's recommendation will not be applicable. The Authority does not intend to limit the use of the spectrum to only commercial use, as this will limit the potential benefits to

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			equipment) and the Spectrum Management Framework. This seems to be an obligation of Spectrum or Station Licence operations where TATT is seeking to determine associated interference risk. As such, TATT needs to consider whether it is undertaking a licensing function with respect to WSD's with the associated monitoring and tracking activities, or whether it is undertaking a Class Licence approach which, by definition in TATT's Authorisation Framework, eliminates the need for such oversight. In the instance that TATT	provision of public telecoms services, and is earmarked for end-user innovation, a Class Licence approach should be followed, but without the need for registration as proposed. This is in line with TATT Spectrum Management Policy, and it's Equipment Standardisation Framework. TATT must work with dispatch to develop a Spectrum Plan that more clearly delineates the specific ranges of spectrum that are being considered. Additionally, TATT should outline the narrative of how this	be derived. WSDs will operate on selected channels within the frequency range 470 – 698 MHz, i.e. the UHF TV broadcasting band. The specific channels and associated power levels will be identified and published by the Authority in the *Schedule of Devices Eligible for Use under a Class Licence*, along with the publication of the final approved version of the Framework. The introduction of WSDs' use of TVWS, forms part of the Authority's broader sub-1GHz spectrum strategy, as indicated amongst the various spectrum management instruments published to date. WSDs operate on unassigned/available spectrum. Therefore, as allocations/assignments change over time with the implementation of broader strategy initiatives within this frequency range, the resultant effect on WSDs

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			believes that WSD's should be subject to strict spectrum or station licence obligations, the spectrum can be used for the provision of public telecoms services, or other commercial applications. However, where TATT believes that a hands off approach should be used, then the spectrum should be primarily used for low power end user applications. TSTT thinks either model can work. However, we strongly believe the hybrid approach proposed by TATT will cause more confusion in the market of spectrum users, ultimately resulting in creating more problems than it is intended	Authorisation Framework sits with the broader sub-1GHz spectrum strategy for Trinidad & Tobago.	will be: i. the number of channels assigned to WSDs. ii. the associated technical limits for use.

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			to solve. TSTT would also like to highlight to TATT that whether or not a spectrum or station licence approach is pursued, TATT must act with dispatch in defining a Spectrum Plan for WSD's clearly identifying the specific ranges of spectrum that become available.		
31	Concluding Comment	CCTL	We support the monitoring of global sector developments to ensure the local market is kept abreast of developments, and benefit from the efficient use of available technologies. However we believe that the industry would benefit from a fuller assessment of related issues before progressing with the	We recommend that TATT reconsider proceeding to make rules for the licensing of fixed WSDs at this point and allow the industry to have a fuller assessment of related issues before progressing with the development of rules.	The Authority believes that the issues related to WSDs, and the use of TVWS in particular, are well documented, as indicated in section 2. The approaches to implementation established by other jurisdictions were well researched and used in the preparation of this Framework. It can be seen from the first round of consultation that there is interest in the use of WSDs, hence the reason for the development of this Framework and public consultation

Item	Section Title	Stakeholder	Comments	Recommendations	TATT's Decision
			development of rules.		on the proposed rules in the Framework. The Authority also believes there are potential benefits to be derived from the introduction of WSDs, as observed from other developing countries.