Appendix I: Decisions on Recommendations (DORs) Matrix from the Second of Two Rounds Public Consultation on the Framework for Fifth Generation (5G) Public Mobile Telecommunications Networks (September 2023)

The following summarises the comments and recommendations received from the second round of public consultation on the *Framework for Fifth Generation (5G) Public Mobile Telecommunications Networks* (the Framework) which took place from 20th January 2023 to 24th February 2023. The decisions made by the Telecommunications Authority of Trinidad and Tobago (the Authority) have been incorporated in the approved version (ver. 1.0) of the Framework, where applicable. The Authority wishes to express its thanks for all comments and recommendations received from the following stakeholders:

- 1. Telecommunications Services of Trinidad and Tobago (TSTT) Limited
- 2. Meta Platforms Inc.
- 3. Joshua Ramlogan
- 4. Digicel (Trinidad & Tobago) Limited (Digicel)

Item	Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
1	TSTT	General	Telecommunications Services of Trinidad and Tobago Limited ("TSTT") appreciates that the Telecommunications Authority of Trinidad and Tobago ("the Authority") has given stakeholders the opportunity to comment on these matters. It should be noted that TSTT's comments on this document do not preclude TSTT from		The Authority acknowledges the appreciation expressed by Telecommunications Services of Trinidad and Tobago Limited (TSTT) for the opportunity to comment on the Framework for Fifth Generation (5G) Public Mobile Telecommunications Networks (the Framework), and its
			making further comments in the future.		position relating to future comments.
2	TSTT	Introduction	TSTT notes the Authority's response to TSTT's comments on the Introductory section in round one of the consultation, which suggests to TSTT that the Authority may not have comprehensively considered the recommendation made by TSTT. TSTT does not object to the Authority's remit as outlined in section 41 (1) of the Telecommunications Act, Chap. 47:31 ("the Act"). Moreover, we do not consider TSTT's proposal regarding discounting spectrum fees to run counter to this regulatory mandate. Instead, it is our considered view that the Authority's mandate, as identified above, and TSTT's proposal are mutually inclusive. TSTT notes the Authority's references to the Global System for	pays greater consideration to reduced or zero-spectrum fees to facilitate the rollout of 5G. This will allow providers to channel their investments in Capex to aid in greater and more efficient access without the burden of	The Authority has previously provided incentives such as forbearance on spectrum fees on a quantum of low-band mobile spectrum to promote rapid rollout of 4G services and during the pandemic. Section 6.8 of the Framework has been amended to state the Authority will consider future incentives to promote the adoption of spectrum to accommodate 5G services including tiered spectrum discounts based on the quantum of spectrum use. Policy statement 21 has been added to reflect this position.
			Mobile Communications Association ("GSMA"), as a well-respected authority in its field. In that regard, TSTT provides the position of the GSMA as it relates to spectrum price discounting and related approaches to be considered in 5G rollouts. The GSMA advises that:		The recommendations and positions of the Global System for Mobile Communications Association (GSMA) as they relate to spectrum price discounting and related approaches are acknowledged by the Authority and have been incorporated in section 6.8 of the Framework.

1

Item Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
Item Stakeholder	Policy Section	 i. "Governments and regulators should avoid inflating 5G spectrum prices as this is linked to slower broadband speeds and worse coverage. Key concerns are excessive reserve prices, annual fees, limited spectrum supply (e.g. through set-asides) and poor auction design. Governments and regulators should assign 5G spectrum to support their digital connectivity goals rather than as a means of maximising state revenues. Effective spectrum pricing policies are vital to support better quality and more affordable 5G services. High spectrum prices are linked to more expensive, slower mobile broadband services with worse coverage. The causes of very high prices are typically policy decisions that appear to prioritise maximising short-term state revenues over long-term socio-economic benefits. To avoid this, governments and regulators should: Set modest reserve prices and annual fees, and rely on the market to determine spectrum prices. 	Recommendations	In relation to the GSMA's advice: i. The Authority has adopted prices for spectrum determined by the market. ii. The Authority has consulted with the public on its spectrum plan for Public Mobile Telecommunications Services (PMTS) which outlines how spectrum will be assigned to mobile operators, where spectrum may be granted by direct assignment or competitive licensing where appropriate. iii. The Authority has carefully considered its approach to spectrum licensing for mobile services through consultation of its 5G Framework and its spectrim plan for PMTS.
		• Consult stakeholders on the award rules and licence terms and conditions, and also take them into account when setting prices (i.e. onerous obligations reduce the value of spectrum)." ii. "Regulators should carefully consider the right 5G spectrum licence terms, conditions and awards approach and consult industry to maximise the benefits of 5G for all. The decisions regulators make around spectrum licensing — including geographic licence areas and terms, conditions and obligations — as well as the mechanism for awarding the licences will have a major impact on 5G services. It is essential that regulators carefully consider these decisions and consult the industry to ensure the best possible 5G services can be delivered." As an example, the government of China, assigned 5G spectrum at no cost, in order to speed up the rollout of networks. ²		

¹ **GSMA**, 5G Spectrum GSMA Public Policy Position June 2022, https://www.gsma.com/spectrum/wp-content/uploads/2022/06/5G-Spectrum-Positions.pdf (accessed February 6, 2023). ² **GSMA**, Realising 5G's full potential: Setting policies for success, https://www.gsma.com/spectrum/wp-content/uploads/2022/06/5G-Spectrum-Positions.pdf (accessed February 6, 2023). ² **GSMA**, Realising 5G's full potential: Setting policies for success, https://www.gsma.com/spectrum/wp-content/uploads/2022/06/5G-Spectrum-Positions.pdf (accessed February 10, 2023). September 2023

Item	Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
3	TSTT	Appendix I: Decisions on Recommendations (July 2022) Item 2- Introduction	TSTT notes the Authority's reference to "demand" for spectrum and "benefits expected from its use" while not acknowledging that its actions and interventions in the market – through improperly and unlawfully initiated Universal Service Programmes that are undermining the value of the market.		With respect to the position that the Authority's interventions are having a negative impact on the marketplace, the decline in mobile internet penetration as reflected in the <i>Quarterly Market Update – Q2 2022</i> is no longer the case, with the update as of Q4 2022 showing a year-on-year (YoY) increase of 5.0%, reinforcing the Authority's assumptions.
			The Authority's Quarterly Market Update ("QMU") demonstrates the negative impact the Authority's intervention has had on the Mobile Internet Penetration numbers of the market (declining 1.2% YoY). This does not create the environment to incentivise investment in new technology, especially with the concomitant expense in associated infrastructure.	its assumptions about market demand and projected market benefits based on	In relation to TSTT's observations on the re-issuance of the <i>Quarterly Market Update – Q2 2022 (republished)</i> , this was deemed necessary to update the Q2 quarterly market information due to the resubmission of data by an operator.
			Further, TSTT notes the Authority's re-issuance and changing of data reported in the Q2 2022 QMU dated January 6, 2023, without appropriate transparency and forewarning to the marketplace. This approach of the Authority in treating with its data reporting function does not encourage market confidence, and further encourages distrust of investment.		
4	TSTT	(July 2022) Item 5 - 3.5.2.4	TSTT appreciates the consideration by the Authority to closely monitor developments on the use of 5G technology in the upper 6GHz band. TSTT re-emphasises the need to use the upper band of 6Ghz (6425-7125 MHz) for the 5G-Advanced era, and we are hopeful that the necessary actions will be taken by the Authority based on feedback from the World Radiocommunications Conference-23.	the upper 6Ghz band for the 5G-Advanced era and is optimistic that the Authority will take the necessary steps	
5	Meta Platforms Inc	General	Meta is pleased to submit its comments and recommendations on TATT's Consultation document: "Framework for Fifth Generation (5G) Public Mobile Telecommunications Networks" and TATT's "Decisions on Recommendations (DORs) Matrix from the First Round of Public Consultation on the Framework for Fifth Generation (5G) Public Mobile Telecommunications Networks (July 2022)".		The Authority acknowledges the appreciation expressed by Meta Platforms Inc. for the opportunity to submit its comment and recommendations on the Framework and the Decisions on Recommendations (DORs) Matrix from the First Round of Public Consultation.

Item	Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
			Meta thanks TATT for the opportunity to submit its comments and recommendations on TATT's proposed Framework for Fifth Generation (5G) Public Mobile Telecommunications Networks.		
6	Meta Platforms Inc	3 Policy and Regulatory Considerations:			The Authority thanks Meta for supporting the development of a 5G Framework to encourage long-term investment in 5G networks in Trinidad and Tobago.
7	Meta Platforms Inc	3.5 Spectrum Requirements 3.5.1 Frequency Bands identified for IMT	Region 2 as follows:	the approach by the ITU which does	The Authority advises that the outcomes of the WRC-23 conference may act as the development trigger and inform the Authority's position on the use of the upper 6 GHz band.

Item Stakeholder Policy Section	Comments	Recommendations	TATT's Decision
8 Meta Platforms Inc 3.5.2 – 3.5.6	It is noted that TATT has identified the salient features of broadband plans from several countries in ITU's Region 2. Several countries have developed plans which include a mix of licensed, technology neutral licenced bands (utilizing low-band, mid-band and high-band spectrum) and unlicensed spectrum. It is further noted that all countries quoted by TATT in Region 2 (USA, Canada, Brazil and Chile) have all identified 1200 MHz in the 6GHz band (5925 – 7125) MHz for unlicensed use in their plans.	plan, TATT adopts the approach used by the countries, identified in Region 2, in the identification of 1200 MHz spectrum in the 6 GHz band (5925 MHz – 7125 MHz) for unlicensed use for Wi-Fi (Wi-Fi 6E and beyond) to	proposed by the Authority for class-licensed use in Trinidad and Tobago, given the consensus on the use of the lower 6 GHz band for unlicensed use internationally. The outcome of the WRC-23 conference and other regional developments may inform the Authority's position on the
Platforms Inc the Accommodation o	TATT has noted that "The Authority is closely monitoring developments on the accommodation of public mobile telecommunications services, which may use 5G technology, in the upper 6 GHz band. In deciding on the use of the upper 6 GHz band, the Authority will evaluate among other factors, whether: 1. ITU has identified this band for IMT for Region 2. 2. relevant studies have confirmed the coexistence of PMTS with existing 6 GHz class-licensed devices and existing licensed systems in the upper 6 GHz band. 3. a suitable ecosystem of public mobile telecommunications equipment exists. 4. there is a level of demand for mid-band spectrum for PMTS in Trinidad and Tobago. 5. there is a regional harmonization effort for the 6 GHz band".	consider the same approach taken by several countries in Region 2, including the USA, Canada, Brazil, Colombia, Costa Rica, Honduras, Peru and the Dominican Republic, in the identification of the total 1200 MHz in the 6 GHz band (5925 MHz – 7125 MHz) for unlicensed use. We believe that the decision of the above-named countries for the identification of the full 6 GHz band for unlicensed use has paved the way for an eventual decision to be taken by the ITU for this identification for Region 2, as a whole. Also, given the thrust by the CTU for the development of the Caribbean as a	consideration and assist in formulating the Authority's position on the use of the 6 GHz band. The Authority currently chairs the harmonisation working group for the Caribbean Telecommunications Union (CTU) spectrum management task force (SMTF) and fully supports harmonisation of the 6 GHz band across CTU member states. The outcome of the CTU harmonization work will also inform the Authority's position on the use

Item	Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
				As noted above, the Dominican Republic has already taken the lead in this direction.	
10	Meta Platforms Inc	DORs from 1st Round of Consultation on 5G Framework 3.5.2.4 Unlicensed Spectrum and 3.5.3.4 Unlicensed Spectrum Contribution from TSTT	TSTT recommends that the upper 6GHz (6425-7125 MHz) be reserved for IMT licensed use.	recommendation put forward by TSTT. As mentioned previously, Meta strongly recommends that, in its plan, TATT adopts the approach of other several countries mentioned above within Region 2 for the identification of 1200 MHz spectrum in the 6 GHz band (5925 MHz – 7125 MHz) for unlicensed use for Wi-Fi (Wi-Fi 6E and beyond) to complement the use of	The Authority notes and will consider the recommendation of Meta on the use of 1200 MHz of spectrum in the 6 GHz band (5925 MHz – 7125 MHz) for unlicensed use to complement the licensed spectrum in the low, mid and high bands for 5G services.
		TATT's position	The Authority is formulating its position on the use of the 6 GHz band. The World Radiocommunication Conference (WRC) process and an IMT identification are crucial to the development of the 6 GHz band. The IMT identification for the upper 6 GHz band in Region 1 shall be completed during WRC-23, and if approved, will act as a development trigger to support that process and provide a globally available ecosystem. The Authority has updated section 6.3 to inform stakeholders of its current position on the upper 6 GHz band.	concerning the identification of the	Ofcom's published position for WRC-23 and the outcome of WRC-23, as published in the Final Acts, will assist in formulating the Authority's position on the use of the 6 GHz band.
				upper 6 GHz band (6425 MHz – 7125	The Authority agrees in principle with the points made and shall make an informed decision on the use of the upper 6 GHz band to avoid equipment standardisation, certification

³ "Update of the 6 GHz band", Ofcom, available at:

[&]quot;The risks of missing out on innovation opportunities would be higher, on balance, if WRC-23 were to agree an "IMT identification". Wi-Fi has developed using global bands and the Wi-Fi industry's international focus for innovation and expansion is now on 6 GHz and the large bandwidth available in the band. There is no other band with similar prospects for Wi-Fi. Mobile innovation in contrast is progressing across many bands". (emphasis added)

September 2023

TATT Ref: 2/17/36

Item	Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
				identification, this could create a mis-	and utilisation issues for customers in Trinidad and
				alignment of TATT's plan with the	Tobago.
				rest of Region 2 and could lead to	
				equipment standardization,	
				certification and utilization issues for	
				TATT given that several Region 2	
				countries already identified the entire	
				6 GHz band for license exempt use.	
				Most importantly, beyond one or two	The information provided on 3GPP standardisation of the
					band, Coleago Consulting's findings and Dynamic
					Spectrum Alliance's (DSA) economic assessment on the
					unlicensed use of the band are appreciated and will be
				1	considered by the Authority when formulating a position
				recently concluded standardization of	on the use of the full 6 GHz band.
				the band, now called n104, as part of	
				its Release 17 specifications.	
				Reserving a portion of the 6 GHz band	
				for a later decision on whether to allow	
				IMT (or not) would forego the	
				immediate economic gains that would	
				have accrued from opening the full 6	
				GHz band to licence exempt	
				operations. In August 2020, Coleago	
				Consulting estimated that 5G will not	
				be deployed in the 6 GHz band for at	
				least a decade ⁴ . During that time, the	
				global economy could forego trillions of euros of economic value that could	
				be generated by Wi-Fi 6E.	
				On the other hand, a recent study	
				commissioned by the Dynamic	
				Spectrum Alliance has accessed the	
				economic value of unlicensed use of	

⁴ See section 7.3 of the report: The 6 GHz Opportunity for IMT – "recognizing the 10+ year timeframe anticipated for 5G at 6 GHz".

Item	Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
				the 6 GHz band in the Caribbean ⁵ .	
				According to the study, the economic	
				value generated by unlicensed use of	
				the 6 GHz band in Trinidad & Tobago	
				is estimated at \$2.80 billion by 2031.	
				Prioritizing a future IMT use in the	Harmonising the Trinidad and Tobago Frequency
				band would slow down the	Allocation Table (TTFAT) with the ITU Table of
				deployment of fiber and endanger	Frequency Allocation, supporting economies of scale, and
				advances on connectivity in Trinidad	delivering affordable solutions to consumers are all vital
				& Tobago, without delivering	considerations in the Authority's decision-making process.
				significant benefits to its end users. In	The views expressed by Meta on the advantages of using the
				particular, the band would not	6 GHz band for unlicensed use and the disadvantages of
				significantly contribute to rural	using the 6 GHz band for licensed use shall be considered
				coverage and therefore would not be	by the Authority.
				relevant in the areas where mobile	
				networks are most important.	
				Meta encourages the	
				Telecommunications Authority of	
				Trinidad & Tobago to consider	
				opening the entire 6 GHz band to	
				license exempt use, a step forward to	
				enabling greater use of this spectrum	
				for the benefit of its citizens.	
				Meta is grateful for the opportunity to	The Authority acknowledges the appreciation expressed by
					Meta for the opportunity to comment on the Framework,
				-	and its position relating to future consultations.
				additional comments in the future in	
				response to further consultation on this	
				issue or any other related matter.	

⁵ Dynamic Spectrum Alliance, Assessing the economic value of unlicensed use of the 6 GHz band in the Caribbean, see at: https://www.dynamicspectrumalliance.org/wp-content/uploads/2022/06/Assessing-the-economic-value-of-unlicensed-use-of-the-6GHz-Band-Caribbean.pdf

Item	Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
11	Joshua Ramlogan	Low Band Spectrum for 5G PMTS	With only ~ 2 x 5 MHz of low band spectrum currently available per operator in the 700 & 800 MHz bands, will TATT be exploring the option of offering more low band spectrum in other bands to operators such as in the 600 MHz band? The ECTEL is currently considering using this band as n71 for PMTS. The current consideration of making the currently reserved 2 x 5 MHz of 850 MHz available is not enough	MHz band for PMTS after the DTV transition to ATSC 3.0 is complete.	comment and recommendation submitted. Currently, a licensed public network occupies significant spectrum in the 600 MHz band. However, the Authority will consider the 600 MHz band for PMTS if the spectrum
12	Digicel	General Comments: Entire Document	to share between three operators. Digicel (Trinidad & Tobago) Limited wishes to thank the Authority for the opportunity to comment on this second round of consultations for this Framework.		becomes available. The Authority acknowledges the appreciation expressed by Digicel (Trinidad & Tobago) Limited (Digicel) for the opportunity to comment on the Framework.
			While we appreciate the work being undertaken on this matter, the Authority should be mindful that there are significant issues that will affect the ability of operators to roll out 5G. It is hoped that consideration will be given in other policy documents to the regulatory intervention that is needed in order to secure the digital future of the country i.e. the creation of a mechanism whereby Over-The-Top ("OTT") companies, who are the real beneficiaries of network investment, will be made to pay their fair share towards same.		The Authority acknowledges the comments of Digicel on the treatment of Over-The-Top services, the decline in revenue from voice services due to the use of applications such as WhatsApp, Zoom and Microsoft Teams and the investment made by operators in upgrading their network to improve and maintain the level of service expected by customers, including those that use OTT services.
			As the Authority can see from data published in its own Annual Market Reports, the telecommunications industry in Trinidad and Tobago is in decline. This is the case regionally as well as internationally. There a consistent decline in revenue from voice services due to the proliferation of unregulated calling applications such as WhatsApp, Zoom, and Microsoft Teams. In addition, mobile data consumption continues to grow exponentially. A significant portion of this growth has been driven by a small number of OTT providers. Six OTT companies, namely, Meta, Alphabet, Tik Tok, Netflix, Amazon and Microsoft are responsible for almost 70% the		These matters are being addressed via a <i>Consultative Framework for Over-The-Top (OTT) Services in Trinidad and Tobago</i> , which presents the Authority's proposed strategies and recommendations in relation to OTT services. The Framework has completed the first of two rounds of consultation and is expected to be issued for the second of two rounds of consultation by August 2023. Following the completion of the ongoing consultation, the Authority shall take steps to implement the measures identified therein.
			Netflix, Amazon and Microsoft are responsible for almost 70% the total internet traffic in the Caribbean. While regional operators face very constrained future growth prospects, OTT revenues have grown by over 150% between 2017 and 2021. In order to accommodate this increasing internet traffic and maintain existing levels of service, operators have invested millions of dollars in network upgrades and improvements since 2017. Currently, OTT operators do not contribute towards the cost of these network		

Item	Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
			investments. Further investment can be sustained only if these OTT companies also contribute fairly and proportionately to the costs of the very networks that generate billions of dollars in revenues for them. It is the position of Digicel that urgent regulatory intervention is needed in order to engage OTT companies to enter into negotiations and ultimately agreements to pay their fair share.		
13	Digicel	1.4 Scope	This Framework outlines the regulatory framework to facilitate the introduction and development of 5G networks in Trinidad and Tobago and: 1. Identifies the appropriate policies, rules and regulations for the planning, authorisation and deployment of 5G networks in Trinidad and Tobago. 2. identifies the key requirements relating to the minimum technical performance of IMT2020 as defined by ITU. 3. does not focus on the 5G network design and architecture, related technologies, or on the actual pricing for 5G spectrum. The scope seems to be contradicting itself between points 1 and 3. Can the Authority indicate the reason for excluding network design and architecture out of the scope? Digicel considers design and architecture as being an integral part of planning.	reasons for excluding network design and architecture from the scope of this	The Authority would specify the required performance level from a coverage and quality perspective, but would not specify the internal design approach of operators' networks to achieve those requirements, which network design and architecture would detail. Operators can determine the most optimal design and architecture to achieve specified levels of quality.
14	Digicel	-	5G Framework Policy Statements: 3. Additional mid-band spectrum in the 2.5 GHz band and the 3.3–3.7 GHz range will be allocated to PMTS, with spectrum caps to be determined. Digicel holds the position that the 2.5Ghz spectrum band is a prime midband allocation for initial 5G deployment and requires equal allocation to all mobile operators.	The Authority is asked to clarify whether 5G spectrum will be allocated equally amongst all mobile operators.	The allocation of spectrum to facilitate the provision of 5G services shall be in keeping with the spectrum caps outlined in the revised <i>Spectrum Plan for the Accommodation of Public Mobile Telecommunications Service (PMTS)</i> which has completed the first of two rounds of public consultation. The Authority thanks Digicel for its comments on the PMTS spectrum plan during the first round of consultation and invites additional comments during the subsequent round of consultation. Given the need for larger bandwidths to support 5G performance, and based on data from the GSMA that over 80% of 5G networks are in the 3.5 GHz band, the Authority proposes to allow operators to determine whether they prefer a smaller quantum of spectrum in every band, or a larger quantum of spectrum in one or fewer bands.

Item	Stakeholder	Policy Section	Comments	Recommendations	TATT's Decision
15	Digicel	6.8 The Telecommunications (Fees) Regulations, 2006	5G Framework Policy Statement 14. The Authority may use auctions, direct assignments and/or price methodologies for the pricing of spectrum for 5G, with the requisite consideration of the availability of information and data, economic value, efficient allocation of spectrum resources and other relevant and reasonable factors. The current Fees Regulations allows for the use of auctions to determine the licence fee for 5G.	breakdown of pricing methods for each portion of the 5G bands.	The assignment of spectrum for the provision of fixed and mobile services, either to new spectrum licensees or where there is a preference for specified spectrum blocks, shall be via a competitive licensing process, as determined by the Authority. The assignment of spectrum to existing and eligible concessionaires, where there is no preference for specified spectrum blocks, shall be via an assignment process determined by the Authority.
			Digicel would like for the Authority to specify which portions of the 5G spectrum bands will use which particular method of pricing.		Section 6.8 has been amended and policy statement 21 added to incorporate that the Authority will also consider incentives to promote the adoption of spectrum to accommodate 5G services including tiered spectrum discounts based on the quantum of spectrum.