RESPONSE TO THE PUBLIC CONSULTATION ISSUED BY THE INFO-COMMUNICATIONS DEVELOPMENT AUTHORITY OF SINGAPORE

PROPOSED REGULATORY FRAMEWORK FOR TV WHITE SPACE OPERATIONS IN THE VHF/UHF BANDS

16 September 2013

1. Introduction

M1 is a leading full-service provider of mobile and fixed communications services with a customer-focused approach. Since commercial launch in 1997, M1 has made significant inroads into the info-communications market and achieved an outstanding track record in innovation, service and technical excellence. We have always been a strong advocate of the pervasive deployment of high speed communications in Singapore. As such, we would be keen to explore the potential of TV White Space ("TVWS") deployment to complement our existing mobile and Internet services.

M1 welcomes this opportunity to make a submission in response to the Info-communications Development Authority of Singapore ("IDA") consultation paper dated 17 June 2013 on the Proposed Regulatory Framework for TVWS Operations in the VHF/UHF Bands.

2. Reservation of Digital Dividend for Mobile Services

M1 has reservations with regard to IDA's proposal to optimise the Digital Dividend band for WSD operations in the interim, pending analogue TV switch off. By allowing WSD operation in the Digital Dividend band on a licence-exempt basis, M1 foresee challenges in spectrum recovery when it comes to allocating such frequencies for mobile services.

In light of increased proliferation of data-hungry services/applications, intelligent networks and machine-to-machine interactions, and adoption of smart devices, it is crucial to ensure that sufficient spectrum is made available to meet the growing demand for mobile services, specifically, mobile broadband services. To avoid delay in deployment on this spectrum, M1 would request IDA to consider bringing forward the date for analogue TV switch off if possible.

3. Licensing Mechanism to Ensure Coexistence

We note that the IDA proposed to allow WSD operations on a licence-exempt basis, and therefore, the mitigating measures for interference put forth in the consultation are focused on technical parameters. However, in view of the different transmit power capabilities of WSDs, we believe that there is merit to licence WSDs capable of transmitting more than 100 mW to further ensure coexistence between WSDs with other users of the VHF and UHF spectrum bands. As such, we would like to propose the adoption of a hybrid-model on licencing:-

i. Licence-exempt approach for devices with transmit power $\leq$ 100 mW; and

ii. As WSDs with transmit power > 100 mW pose greater risks in terms of interference, M1 propose such devices be licensable.

At the same time, we support the designation of a restricted number of TVWS channels to support the deployment of services that require certainty of spectrum access.

4. Comments on the IDA Technical Proposals

Ref.	IDA Question	M1 Comment
Q5.	IDA invites views on adopting a database approach as the mandated method to access white space spectrum.	Spectrum sensing technology has come a long way since the development of TVWS policies by OFCOM and the FCC in years 2009 and 2010 respectively. M1 believes that the technology is sufficiently developed that it can be relied upon for determining efficient and opportunistic access to white space spectrum. On the other hand, the geo-location database approach would rely heavily on the accuracy and availability of the database. As such, issues pertaining to the operations and maintenance of the database would have to be considered and addressed. In view of the above, we would request IDA to consider adopting spectrum sensing as the mandated method to access white space spectrum.
Q8.	IDA invites views on the output power transmission of WSDs as shown in table 2.	M1 views that licensable spectrum should be designated for WSDs with transmit power higher than 1 Watt EIRP.
Q10.	IDA invites views on the requirement of a unique WSD identifier and for this identifier to be based on standards developed by recognised standards organisations.	M1 supports IDA's views. Specifically, the unique WSD identifier should be internationally harmonised.
Q15.	IDA invites views on the proposed propagation model and parameters used to determine the maximum transmission npower level of a WSD.	We note that the proposed separation distance used by IDA is based on the assumption of antenna height of 30 km and 1 km for transmitting and receiving antenna. We do not think that such a high antenna height should be used for this computation. Instead, M1 propose that IDA consider the throughput requirement and uplink link budget as inputs for determining the maximum transmission power level of WSDs.

Ref.	IDA Question	M1 Comment
Q17.	IDA invites views on the need to develop a registration process for users of licence-exempt wireless microphones that require additional channels beyond the safe harbour channels.	M1 is supportive of the requirement. The requirement is more pertinent should IDA decide to adopt the geo-location database approach for WSD to access white space spectrum – the database would have to be updated, preferably in real-time, on changes to availability of spectrum at any location.
Q19.	IDA invites views on the aggregate interference effect of WSD and whether any adjustment in terms of technical requirement is needed.	M1 is concerned with the interference effects of WSDs. To mitigate interference, WSDs should be equipped with cognitive sensing capabilities.
Q21.	IDA invites views on allowing the manual input and internal storage of geographic coordinates for indoor fixed devices.	In the event that IDA decides to adopt the geo-location database approach for WSD, M1 is of the view that the database administrator should be the party responsible for the review and audit process of any indoor installation.
Q22.	IDA invites views on the requirement of an approval process for the installer of indoor Fixed Devices and the necessary conditions for approval.	
Q24.	IDA invites views on the payment of fees for the use of database services.	If IDA decides to adopt a spectrum sensing approach for WSD to access white space spectrum, rather than geo-location database, it would no longer be necessary to develop and maintain a database.
Q25.	IDA invites views on both approaches in managing the database (i.e. industry-managed or government-managed database.	In the event that IDA decides to adopt a geo-location database approach for WSD to access white space spectrum, an industry-managed database would be preferred.