

Motorola Solutions response to the IDA public consultation paper

Second consultation on proposed framework for the allocation of spectrum for IMT and IMT-Advanced services and for the enhancement of competition in the mobile market

Question 1: IDA would like to seek views and comments on the proposed allocation of the 700 MHz band together with other suitable bands for mobile services in the next spectrum allocation exercise; and the mechanism to allow the delay of the commencement date of the 700 MHz spectrum right, and correspondingly, the expiry date as well as the spectrum right payment due date, in the event of a delay in the ASO.

Motorola Solution's Views and Comments:

Allocation of the 700 MHz band Digital Dividend spectrum is the best solution for meeting the mobile broadband data explosion challenge faced by the telecommunications regulators to meet the needs of additional spectrum for the deployment of new mobile broadband networks and capacity. As of today, the APT band plan is considered to be the most effective arrangement in the 700 MHz band from the point of view of modern spectrum management. Currently, the FDD 700 plan is most widely accepted and implemented across the world.

Since January 2012 – Before and during the World Radio Conference 2012, the APT band plan has gained momentum resulting in a number of countries announcing publicly their preference of this band plan. The plan is also included in the Recommendation ITU-R M.1036-4 “Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications (IMT) in the bands identified for IMT in the Radio Regulations” (Rec. ITU-R M.1036) and has been adopted by the 3GPP as LTE Band 28.

We therefore support the IDA plan of adopting the FDD APT 700 MHz band plan to meet the growing needs of mobile broadband services

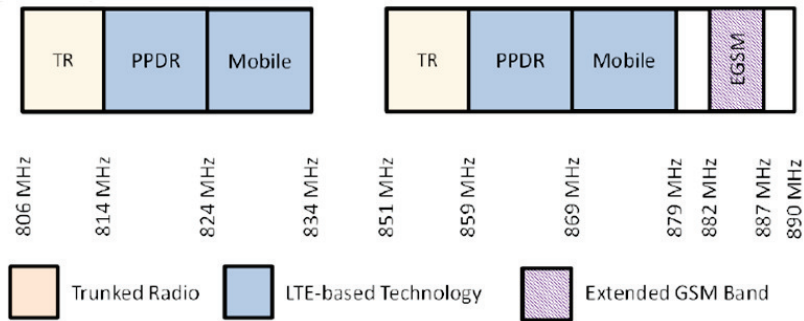
We also believe that IDA should provide sufficient buffer of about 10 MHz between the two broadband channels, one in the upper end of 700 MHz band ending at 803 MHz and the other at the start of the mobile broadband in 800 MHz. This is to protect the mobile broadband services in the APT 700 band. Part of this buffer can be used for narrow band Trunk Radio (TR) services.

Question 2: IDA would like to seek views and comments on:

- a) The proposed 800 MHz band plan based on the 3GPP band 26, or a combination of 3GPP band 27 and band 5 (excluding the EGSM band), including views on the possible phased approach and timeline to migrate existing users of the band; and
- b) The impact to existing users (i.e., Trunked radio and SRD) of the 800 MHz band plan based on the 3GPP band 26, or a combination of 3GPP band 27 and band 5 (excluding the EGSM band).

Motorola Solutions Views and Comments:

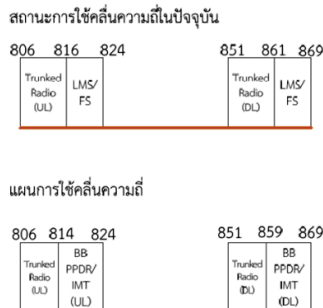
We fully support iDA’s proposal to re-farm the 800 MHz band based on 3GPP Band 26. We agree that a phased approach will minimise disruption to existing users affected by the re-farming. We support the following band plan proposed by IDA:



This band plan is also being favoured by a number of neighbouring countries including Malaysia, Indonesia, and Vietnam. Such a regional harmonization in ASEAN around 3GPP Band 26 would enable better cross border coordination, smoother migration, efficiency in device ecosystem and better spectrum utilization. Adoption of this band plan in ASEAN countries would avoid complex scenarios of cross border interference that would otherwise occur if different band plans are used in neighbouring countries.

Thailand has already adopted this band plan as below:

แผนภูมิการปรับปรุงการใช้คลื่นความถี่ ย่านความถี่ 806-824 เมกะเฮิรตซ์ (MHz) และ 851-869 เมกะเฮิรตซ์ (MHz)



We further propose that the band 824 – 834 / 869 – 879 MHz be considered for mobile broadband services for government use rather than for commercial mobile use. A government mobile broadband network will be able to complement the PPDR network in the event of a

major disaster event or national emergencies and would facilitate synergies that would result from operation and procurement of similar and interoperable infrastructure and in adjacent channels for both government private use and PPDR agencies.

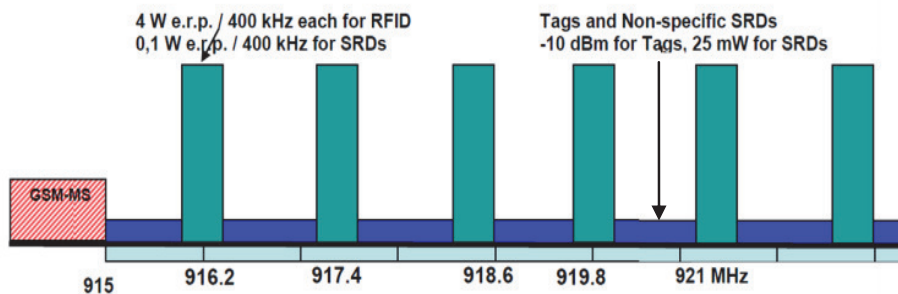
Noting that the entire 806-821/851-866 MHz is currently occupied by the existing Trunk Radio (TR) users, IDA’s should refarm the existing TR users in 814-821/859-866 MHz to the lower part of the band viz. 806-813/851-858 MHz with 1 MHz guard band between the narrowband and the broadband services. This lower part TR band will also provide the necessary buffer for protecting the upper part of the APT 700 MHz band as broadband UL to broadband UL transmission requires a much wider protection channel compared to a Narrowband to Broadband UL-UL Interference.

We further believe that narrow band TR services will continue to be used in the foreseeable future and will need more than 7+7 MHz spectrum. For this purpose we request iDA to explore additional spectrum for TR services such as in 350-360/360-370 MHz band and 804-806/849-851 MHz.

As spectrum refarming process in 800 MHz band is expected to take some time, it is proposed that the band 824-834/869-879 MHz may be used for broadband PPDR until the TR users have been refarmed to the lower end. Thereafter this band may be considered for government services.

Further, we do not believe that Band 27 will be implemented in Asia. This band was proposed by a Brazil TR operator and was designed only for Region 2 – Non USA. See 3GPP definition of this band¹. Till today there has been no work on this band anywhere in the world. Therefore we expect Band 26 will be the most prevalent band in Asia in 800 MHz band.

Motorola Solutions also support the IDA proposal to relocate the SRDs from 800 MHz to 900 MHz band. This will align Singapore with many advanced nations that use the 900 MHz GSM gap for short range services. 900 MHz is more suitable for high performance RFID and SRD applications. One possible option is shown below:



¹ <http://www.3gpp.org/DynaReport/FeatureOrStudyItemFile-510032.htm>

Question 3: IDA would like to seek views and comments on the allocation of the short-term spectrum rights for the EGSM band, including the approach to extend the short-term spectrum right.

Motorola Solutions Views and Comments:

We wish to express our concern over iDA's reservation of the band 880 – 885/ 925 – 930 MHz for High Speed Rail using GSM-R as a possible technology. According to the GSM-R industry², GSM-R will be supported until 2025, which is almost near the time frame for expected implementation of HSR. Some European Rail operators are already replacing GSM-R with TETRA³. We believe that TETRA⁴ is a more suitable technology for HSR. Further, from a Singapore perspective and the possible future integration and/or coordination with the Singapore MRT, TETRA is a preferred technology for the HSR. Therefore there is no need to reserve any spectrum for GSM-R, which will any way be not in line the HSR time frame.

TETRA has been adopted by many Railway including:

London Underground
Dubai Metro, UAE
Bilbao Metro, Spain
Copenhagen Metro
French SNCF
Bangkok MRTA
Hong Kong KCRC
Malaysia Express Rail Link
Singapore Mass Rapid Transit
Taiwan National Railway
Hong Kong MTRC
Taiwan High Speed Rail



We propose that a more technology neutral approach by not designating a specific frequency band for HSR communications first. We propose that other suitable communications technologies for HSR operations be taken into consideration first before deciding on the frequency band to be used. In this way the selection of the most appropriate solution will not be pre-empted by the decision to use a specific frequency band.

In this context we propose that the band 880-885/ 925-930 MHz be used as a buffer between LTE down link below 879 MHz and 3G/4G uplink above 885 MHz. We believe that

² From the GSM-R Industry Group's strategic key messages:
<http://www.gsm-rail.com/drupal/messages>

³ Finland to replace existing GSM-R network with TETRA
<http://www.mccmag.com/News/NewsDetails/NewsID/11578>,
<http://www.railwaygazette.com/news/infrastructure/single-view/view/finland-to-drop-gsm-r-in-favour-of-domestic-radio-system.html>

⁴ From TETRA Rail group
http://www.tandcca.com/Library/Documents/TETRA_Resources/Library/Presentations/MiddleEast2011Davis.pdf

Singapore, as a regional hub, should retain some GSM services well beyond 2017 to keep the connectivity for visitors from surrounding developing countries which plan to continue using GSM for many more years to come. In the longer term, this band can be considered for machine-to-machine (m2m) communications, using narrow band technologies that will continue to provide the necessary buffer between uplink and down link.

Question 4 to 8:

Motorola Solutions has no Comments and Views on Questions 4 to 8

=====END OF RESPONSE=====