

DRAFT**UNITED STATES OF AMERICA****PROPOSALS FOR THE WORK OF THE CONFERENCE****Introduction**

In this document, the United States of America makes a proposal under WRC-15 Agenda Item 1.1 regarding the 470-694/698 MHz frequency range. Specifically, the United States proposes adding a co-primary allocation to the Mobile Service in the 470-694/698 MHz frequency range, along with a corresponding identification for International Mobile Telecommunications (IMT). The United States of America also proposes the retention of the primary allocation for the Broadcasting Service, explicit protection of these systems via Article No. 9.21, and support for the consideration of the development of world-wide next generation television broadcast systems.

Background

Mobile broadband access has become a key driver of global economic growth, job creation and competitiveness. In developing countries, where mobile wireless is often the only means to achieve ubiquitous broadband access, it has become an economic imperative. Africa, for example, has experienced the highest growth, with mobile-broadband penetration increasing from 2% in 2010 to 11% in 2013.¹ This dramatic growth in mobile-broadband traffic, with mobile video comprising over 50% and growing², has resulted in an acute need for additional spectrum. The 2012 World Radiocommunication Conference recognized this need and adopted WRC-15 Agenda Item 1.1, in an effort to address the looming spectrum shortage for the mobile broadband services.

In considering the global spectrum requirements under WRC-15 Agenda Item 1.1, it is important to acknowledge, as reflected in *recognizing d* of Resolution **233 (WRC-12)**, that the spectrum below 1 GHz is exceptionally suited for mobile broadband applications. In particular, the unique propagation characteristics of the bands below 1 GHz allow for wider area coverage which in turn requires less infrastructure and facilitates service delivery to rural or sparsely populated areas, as reflected in *recognizing c* of Resolution **233 (WRC-12)**.

The 470-806/862 MHz frequency range is allocated to the broadcasting service on a primary basis in all three Regions and used predominantly for the delivery of broadcast television. Broadcasting continues to be an important service as broadcast television stations provide information and video programming that is responsive to the needs and interests of the communities they serve. Moreover, broadcast television itself continues to evolve to keep pace with technological and marketplace changes. Many television broadcasters now pursue a three-screen approach, sharing their programming online and on mobile devices, in addition to providing it over the air. In fact, providing

¹ <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2013-e.pdf>

² http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html

mobile access to broadcast television content is a compelling factor in the development of future DTTB systems.

In this regard, efforts are also underway in the United States and worldwide to develop the next generation of terrestrial broadcast systems. One such initiative, the Future of Broadcast Television Initiative (FoBTV) is a worldwide effort to define requirements, recommend technologies and request standardization for such systems. A key element of any next generation broadcast system recognized by the FoBTV Initiative is: “The importance of mobility in future broadcast systems and the desire for mobile, handheld and portable devices to be capable of working across borders ...”. Within the United States, work on the development of these next generation standards has already begun. “The Advanced Television Systems Committee (ATSC) has received 11 initial proposals from 20 organizations for the Physical Layer of the new “ATSC 3.0” broadcast television standard.” “A primary goal of the ATSC 3.0 Physical Layer is to provide TV service to both fixed and mobile devices. Key considerations include efficiency and robust service, increased data rates to support new services such as Ultra High-Definition services, and enabling a smooth transition from existing systems for both broadcasters and consumers.”³[Placeholder for additional text from broadcasters.]

The importance of broadcasting in emergencies has been recognized and highlighted in a recent draft ITU Report.⁴ As stated in this report, “television broadcasting is a critically important medium for information dissemination to the public in times of emergencies. The intrinsic one-to-many broadcast architecture and the geographic diversity of terrestrial broadcast transmission facilities provide high service reliability during crises of all types. ... The case studies in this report represent only a few of countless examples that attest to the global importance of terrestrial broadcasting, helping to protect and save lives during local, national and international emergencies.”⁵
[Placeholder for potential text from IMT on their respective ability to support emergency services]

[Potential interference between broadcasting and mobile operations also needs to be taken into account. The protection of the broadcasting service is an important consideration. Studies submitted to ITU-R Joint Technical Group 4-5-6-7 indicate that sharing in the UHF band between IMT and DTTB is difficult and may not be practical due to the large distance and frequency separations required. These studies indicate that co-channel sharing between IMT base stations and a DTTB receiver may require separation distances of approximately 100 km. These separation distances decrease to approximately 20 km for adjacent channel (6 MHz) operation.⁶ Studies conducted in the United States suggest that sharing between high power DTTB transmitters and IMT base station

³ <http://atsc.org/cms/>

⁴ www.itu.int/go/ITU-R/RWP6A-2013

⁵ See, Proposed Draft New Report on the Importance of Terrestrial Broadcasting in Providing Emergency Information to the Public, Document 6/156-E, Document 6A/301-A, 28 October 2013, at p. 12.

It should be noted that DTTB in the United States operates with contiguous 6 MHz channels and IMT is general based on contiguous 5 MHz channelization. Accordingly, IMT 5 MHz channels would generally not align with 6 MHz television channels; and therefore, a single IMT 5 MHz channel would in most instances be co-channel to two DTTB channels and the larger co-channel distances would apply to both channels.

receivers may require significantly greater co-channel and adjacent channel distances. / Co-channel sharing in the UHF band between IMT and DTTB is difficult. In this regard, the United States emphasizes the application of Article 9.21, which would require explicit coordination agreement for implementation of mobile systems. To address these interference concerns, the United States emphasizes the mandatory application of Article 9.21, which would require explicit coordination agreement for implementation of mobile systems.

Recognizing the growing need for mobile spectrum below 1 GHz, the current deployment and future development of broadcasting systems, and the differing national priorities of the member states as regards UHF broadcasting, it is necessary for WRC-15 to adopt a regulatory solution that would:

- (a) Enable administrations to preserve and protect broadcasting and other services in the UHF range,
- (b) Consider ways to facilitate the development of future broadcasting systems, and
- (c) Allow administrations flexibility to address the mobile spectrum shortage consistent with their domestic requirements.

To achieve these objectives, the United States proposes modifications to the Radio Regulations that would add an allocation to the mobile services and an identification for IMT in the range 470-694/698 MHz. The United States also proposes retention of the primary allocation to the Broadcasting Service in the 470-890 MHz frequency range, including the mandatory application of Article Number 9.21, which would ensure that the existing services, such as broadcasting, maintain coordination priority (i.e., remain super-primary) vis-à-vis IMT systems.

The WRC-15 proposals presented below provide these changes to Article 5 of the Radio Regulations.

Agenda Item 1.1

1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution **233 (WRC-12)**

Proposal:

ARTICLE 5
Frequency allocations
Section IV – Table of Frequency Allocations
(See No.2.1)

MOD USA/1.1/1

460-890 MHz

Allocation to services		
Region 1	Region 2	Region 3
470-790 BROADCASTING <u>MOBILE ADD 5.317A, ADD 5.YYY</u> 5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.311A 5.312 5.312A	470-512 BROADCASTING Fixed <u>MOBILE ADD 5.317A, ADD 5.YYY</u> ▼ 5.292 <u>MOD 5.293</u>	470-585 FIXED <u>MOBILE ADD 5.317A, ADD 5.YYY</u> BROADCASTING 5.291 5.298
	512-608 BROADCASTING <u>MOBILE ADD 5.317A, ADD 5.YYY</u> <u>MOD 5.297</u>	585-610 FIXED <u>MOBILE ADD 5.317A, ADD 5.YYY</u> BROADCASTING RADIONAVIGATION 5.149 5.305 5.306 5.307
	608-614 RADIO ASTRONOMY <u>MOBILE ADD 5.317A ; ADD 5.XXX</u> Mobile-satellite except aeronautical mobile-satellite (Earth-to-space)	610-890 FIXED MOBILE 5.313A <u>MOD 5.317A ADD 5.YYY</u> BROADCASTING
	614-698 BROADCASTING Fixed <u>MOBILE ADD 5.317A, ADD 5.YYY</u> ▼ <u>MOD 5.293 5.309 5.311A</u>	
	698-806 MOBILE 5.313B <u>MOD 5.317A, ADD 5.YYY</u> BROADCASTING Fixed	
790-862 FIXED MOBILE except aeronautical mobile 5.316B <u>MOD 5.317A, ADD 5.YYY</u> BROADCASTING 5.312 5.314 5.315 5.316 5.316A 5.319	<u>MOD 5.293 5.309 5.311A</u> 806-890 FIXED MOBILE <u>MOD 5.317A ADD 5.YYY</u> BROADCASTING	
862-890 FIXED MOBILE except aeronautical mobile <u>MOD 5.317A, ADD 5.YYY</u> BROADCASTING 5.322 5.319 5.323	5.317 5.318	5.149 5.305 5.306 5.307 5.311A 5.320

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Reasons: Globally harmonized allocations to the mobile service in the 470-698 MHz frequency range would enable introduction of innovative broadband services while preserving access to spectrum for the existing

services, such as broadcasting. A new allocation to the mobile service would provide administrations with the flexibility to maximize spectrum utilization. Under the proposed allocation arrangements, administrations may continue to operate existing services, such as broadcasting, or utilize portions of the UHF band for the implementation of new mobile broadband applications, such as IMT, as they deem appropriate based on their domestic priorities, taking into account potential interference considerations.

MOD USA/AI 1.1/2

5.317A Those parts of the band ~~470-960~~ MHz which are allocated to the mobile service on a primary basis are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) – see Resolutions **224 (Rev.WRC-12)** and **749 (Rev.WRC-12)**, as appropriate. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-15)

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Reasons: Globally harmonized allocations to the mobile service in the 470-960 MHz frequency range would enable introduction of innovative broadband services, such as IMT, while preserving access to spectrum for the existing services, such as broadcasting. The new allocation to the mobile service would provide administrations with the necessary flexibility to maximize spectrum utilization consistent with their domestic timetables, requirements and objectives.

MOD USA/AI 1.1/3

5.293 Different category of service: in Canada, Chile, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-806 MHz to the fixed service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. In Argentina and Ecuador, the allocation of the band 470-512 MHz to the fixed service is on a primary basis (see No. 5.33), subject to agreement obtained under No. 9.21. (WRC 15)

Reasons: Consequential change. Proposed allocation to Mobile service supersedes allocation(s) by footnote.

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MOD USA/AI 1.1/4

5.297 Additional allocation: in Canada, Costa Rica, Cuba, El Salvador, the United States, Guatemala, Guyana, Honduras, Jamaica and Mexico, the band 512-608 MHz is also allocated to the fixed service on a primary basis, subject to agreement obtained under No. 9.21. (WRC 15)

Reasons: Consequential change. Proposed allocation to Mobile service supersedes allocation(s) by footnote

ADD USA/AI 1.1/5

5.XXX In making assignments to stations in the mobile service in the band 608-614 MHz, administrations shall take all practicable steps to protect the radio astronomy service operations from harmful interference. (WRC-15)

Reasons: Compatibility between mobile and radio astronomy stations is a localized issue that can best be addressed by administrations in the application of domestic regulations.

ADD USA/AI 1.1/6

5.YYY Prior authorized primary services need interference protection. The operation of stations in the mobile service for the implementation of International Mobile Telecommunications (IMT) in the frequency band 470-694 MHz in Region 1 and in 470-698 MHz in Region 2 and Region 3 shall be subject to agreement obtained under No. 9.21”

Reasons: The application of coordination article No. 9.21 requires the explicit agreement of the affected administrations. The mandatory application of article No. 9.21, therefore, would ensure the protection of incumbent systems such as broadcasting vis-à-vis IMT systems. The above provision would also facilitate the development of future broadcasting systems. Global harmonization is an important factor for broadcast television services and will become even more so as mobile broadcast services are implemented that will facilitate the use of portable television broadcast devices.
