VIEW A: No Change under AI 1.1 for the 3400-4200 MHz and 4500-4800 MHz bands

WAC members setting forth this view carefully considered that without a mechanism that: i) ensures continued satellite access, ii) protects existing satellite earth station receive operations, iii) addresses two-way compatibility issues, and iv) does not constrain future growth for fixed-satellite service (FSS) in the 3400-4200 MHz and 4500-4800 MHz bands, it is necessary for the United States to propose no changes (NOC) to WRC-15 under agenda item 1.1 for these bands. 21st Century Fox, Inc., ARRL, Aviation Spectrum Resources, Inc., CBS, Inc., EchoStar Corporation, Inmarsat, Intelsat, Lockheed Martin Corp., New Wave Spectrum Partners LLC, Satellite Industry Association, SES Americom, The Boeing Company, Time Warner, Inc., and Viacom, Inc. support this view.

Continued access to the C-Band spectrum used to provide critical and highly reliable satellite services globally must be assured. The 3400-4200 MHz and 4500-4800 MHz bands are globally allocated and harmonized to provide C-Band FSS downlinks. C-band is the preferred frequency band for a number of reasons. One of the main reasons is its unique and important technical properties - low rain fade - which makes it appropriate for national telecommunication and broadcasting infrastructure, satellite telemetry, disaster relief, public meteorological data distribution, and aeronautical applications in various regions. Technical and regulatory mechanisms must be fully developed to ensure continued worldwide access for these services in the increasingly-congested international radiofrequency spectrum environment. Any proposal identifying IMT for these bands that relies upon administrations to individually determine a level of protection for the FSS operating within their territories would mean that continued access for these critical and highly reliable services – either worldwide or within individual ITU Regions –would be unacceptably not assured.

Global interference protection to FSS would not be provided given the significant separation distances required. Protection of satellite services (in this case receiving earth stations) could only practically be accomplished through individual coordination. As noted in the draft NOC proposal in the Attachment to this view, ITU-R studies conducted in Joint Task Group 4-5-6-7 to assess the technical feasibility of deploying IMT-Advanced systems in the 3400-4200 MHz and 4500-4800 MHz bands, and recently approved by ITU-R Study Group 5 in November 2014 conclude unequivocally that when FSS is deployed in a ubiquitous manner and/or with no individual licensing of earth stations, sharing with IMT is not feasible in the same geographical area since no minimum separation distance can be guaranteed. ITU-R studies determined that the separation distances required to protect FSS earth stations, taking the effects of terrain into account, have been found to range from at least tens of kilometers up to several hundred kilometers based on the various potential IMT Advanced macro cell and small cells deployment scenarios.

Taking into account the number of earth stations deployed around the world, maintenance of separation distances on this order requires a clearly specified global approach to ensure protection of the incumbent primary FSS. Mechanisms considered by proponents of an IMT identification provide a level of protection only at the border of a neighboring administration and no protection at all for earth stations operating within the country of an administration authorizing IMT. In other words, there would not be global protection for receiving earth stations. Therefore, noting that the resulting contours produced by these separation distances enclose areas of considerable size and given the considerable

numbers of FSS earth stations that operate in the C-band frequencies around the world, IMT deployment in the 3400-4200 MHz and 4500-4800 MHz bands is not feasible.

Locations of many operating earth stations are unknown and would not be able to be protected. In the United States, and likewise around the world, many earth stations in the C-Band (including millions of receive-only earth stations) are registered only in rare situations. There has been no requirement to register such earth stations, as discussed in DNReport ITU-R [FSS-IMT C-BAND DOWNLINK], and thus the physical locations of all of the operating C-band earth stations is unknown and changeable at will. Without having a complete and accurately updated list of locations, protecting these earth stations that are operating in the primary FSS spectrum allocation through a coordination process is not feasible on a global scale.

U.S. domestic use is unique and should not drive international policy and future FSS growth. Internationally, in contrast with the United States, the use of the 3400-3700 MHz band is not treated differently than that of the 3700-4200 MHz band. Within the 3600-3700 MHz band, U.S. earth station locations are known via a listing in the FCC licensing database, and are few in number. There are no U.S. earth station operations in the 3400-3600 MHz band, and there are approximately 5,000 U.S.-licensed earth stations in the 3700-4200 MHz band – with many times more unregistered. The 4500-4800 MHz band is an Appendix 30B band intended to assure equitable access for developed and developing countries; however, there are currently no U.S. earth stations in the 4500-4800 MHz band. Although the FCC has an on-going rulemaking/allocation proceeding that is considering an allocation and associated technical rules for mobile broadband in the 3550-3650 MHz (and potentially the 3650-3700 MHz band, where, unlike the situation internationally, there is a known and small set of operating U.S. earth stations), the technical and regulatory mechanisms to protect these stations have not yet been established. Indeed, there is no consensus on whether meaningful technical and regulatory mechanisms to protect these stations (as well as earth stations operating in frequency bands adjacent to spectrum used for mobile broadband) are even viable. It is therefore premature for the United States to export such an approach internationally under agenda item 1.1 at WRC-15, and doing so in any event would not respect the global differences and future FSS growth in these bands. The C-band FSS applications would be severely impacted if any additional constraints were to be imposed on their locations and/or deployments.

* * *

For all of these reasons, the only alternative for the United States at WRC-15 is to propose to WRC-15 that there be no changes for these bands under agenda item 1.1, as reflected in the Attachment hereto.

VIEW A: No Change under AI 1.1 for the 3400-4200 MHz and 4500-4800 MHz bands

ATTACHMENT TO VIEW A:

DRAFT PROPOSAL FOR NO CHANGE UNDER AGENDA ITEM 1.1
FOR THE 3400-4200 MHz AND 4500-4800 MHZ

United States of America

Draft Proposals for the Work of the WRC-15

AGENDA ITEM 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)**

BACKGROUND: Joint Task Group 4-5-6-7 (JTG 4-5-6-7) was established by Conference Preparatory Meeting 15-1 to conduct sharing studies under agenda item 1.1 and prepare draft CPM text. The IMT spectrum requirements under this agenda item, as well as characteristics of envisioned IMT systems, were developed in Working Party 5D (WP 5D). In addition, WP 5D has defined suitable frequency ranges for IMT as 410 to 6425 MHz. The JTG conducted studies in a variety of frequency bands within this suitable range, including 3400-4200 MHz and 4500-4800 MHz which are allocated to the fixed-satellite service (FSS) on a primary basis and generally referred to as "C-band."

These global C-band FSS allocations are and have been the workhorse spectrum bands for the FSS since the 1970's. There are approximately 180 geostationary satellites operating in these bands, and many new satellites with C-band capacity have been constructed or are under construction and scheduled to be launched in the near future. The C-band, with its unique and important technical properties, such as low rain fade and coverage of wide service areas, is extensively used worldwide. After several decades of development, C-band payloads reflect an efficient, proven technology; this allows for very low cost equipment which benefits users, small and large, in developing or developed nations. This is also the reason why many countries have utilized C-band to establish themselves as space-faring nations, placing their important national telecommunication and broadcasting infrastructure in the bands with high availability and reliability, at the lowest costs. In addition, many highly sensitive and public services are also using FSS C-band, such as satellite telemetry, disaster relief, public meteorological data distribution, and aeronautical applications in various regions, etc.

The 3400-3500 MHz segment is allocated on a secondary basis to the amateur service in ITU Regions 2 and 3, with a secondary allocation by footnote in some countries in ITU Region 1. A variety of operation types are accommodated, including satellite operations in subbands where the amateur-satellite service is authorized, and operations implementing broadband technologies in amateur networks, including

802.11 protocols and LTE, concentrated in the 3460-3500 MHz segment by convention. A number of more traditional amateur systems are accommodated.

With respect to sharing studies in the 3400-4200 MHz and 4500-4800 MHz bands, Report ITU-R M.2109 finds that the minimum required separation distances from IMT-Advanced base stations, when using the long term interference criterion derived in the studies, are at least in the tens of kilometers for in-band co-channel operations; and that the minimum separation distances associated with short-term interference criterion, generally, but not in all cases, exceed one hundred kilometers in the considered cases with similar assumptions as the ones used for the long-term.

The conclusion of the JTG 4-5-6-7 studies indicate that if FSS is deployed in a ubiquitous manner and/or with no individual licensing of earth stations, sharing is not feasible in the same geographical area since no minimum separation distance can be guaranteed. The FSS deployment in C-band is ubiquitous in most geographical areas of the world. C-band FSS applications would be severely impacted if limitations are imposed on their location and/or deployments.

Similarly, recent sharing studies have been performed in JTG 4-5-6-7 to assess the technical feasibility of deploying IMT-Advanced systems in the 3 400-4 200 MHz and 4500-4800 MHz bands using the latest IMT-Advanced characteristics provided by WP 5D. These results from the recent sharing studies have shown no improvements in the ability of IMT-Advanced to share with FSS, and thus are in line with those already found in Report ITU-R M.2109. To provide protection of the FSS receive earth stations operating in the C-band, the following measures are required:

- For the in-band case, for suburban and urban macro-cell as well as small-cell outdoor deployment scenarios, for the long-term interference criterion, the required separation distances are at least in the tens of km. Similarly, in the case of IMT-Advanced small-cell indoor deployment scenarios, the required separation distances vary from about 5 kilometres to tens of kilometres
- For the out of band case, using the long-term interference criteria, the required separation distance is from 5 kilometres up to tens of kilometres for IMT-Advanced macro-cell (urban and suburban) deployment and from 900 metres to less than 5 kilometres for IMT-Advanced small-cell outdoor deployments, respectively, with no guard band.
- For a specific macro-cell deployment scenario studied, the required separation distances from the edge of the IMT-Advanced deployment area are in the range of 30 kilometres to 20 kilometres with an associated guardband of 2 MHz to 80 MHz respectively. The results show that an IMT implementation of any deployment scenario sterilizes large geographical areas preventing future deployment of satellite earth stations, e.g.,VSATs.

With respect to sharing studies in the band 4 500-4 800 MHz, it should be recognized that this band is part of the Appendix 30B FSS Plan. This Plan aims to preserve orbit/spectrum resources and guarantee, for developed and developing countries equitable access to the geostationary-satellite orbit at anytime and anywhere for their use. From a technical point of view, the same sharing difficulties will be faced when IMT is allocated in this band as found above for the 3400-4200 MHz band.

VIEW A: No Change under AI 1.1 for the 3400-4200 MHz and 4500-4800 MHz bands

Noting that the resulting contours produced by these sharing studies enclose areas of considerable size, and given the considerable numbers of FSS Earth stations that operate in the C band around the world, IMT deployment in this band would not be feasible.

Sharing studies were not conducted to evaluate compatibility with amateur service stations. The secondary nature of the amateur service allocation requires flexibility in frequency selection to permit an amateur service licensee to use the allocation and fulfill his or her obligation not to cause harmful interference to the numerous primary services, including the FSS.

As a result, this Administration proposes no change to the 3400-4200 MHz and 4500-4800 MHz frequency bands under this agenda item.

PROPOSAL:

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations
(See No. **2.1**)

NOC USA/1.1/1

2 700-4 800 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
* * * * *		
3 400-3 600 FIXED FIXED-SATELLITE (space-to-Earth) Mobile 5.430A Radiolocation	**3 400-3 500** FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile 5.431A Radiolocation 5.433 5.282	**3 400-3 500** FIXED FIXED-SATELLITE (space-to-Earth) Amateur Mobile 5.432B Radiolocation 5.433 5.282 5.432 5.432A

VIEW A: No Change under AI 1.1 for the 3400-4200 MHz and 4500-4800 MHz bands

<table>
<tr><td></td><td>3 500-3 700
FIXED
FIXED-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile
Radiolocation 5.433</td><td>3 500-3 600
FIXED
FIXED-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile 5.433A
Radiolocation 5.433</td></tr>
<tr><td>5.431</td><td></td><td></td></tr>
<tr><td>3 600-4 200
FIXED
FIXED-SATELLITE (space-to-Earth)
Mobile</td><td></td><td>3 600-3 700
FIXED
FIXED-SATELLITE (space-to-Earth)
MOBILE except aeronautical mobile
Radiolocation
5.435</td></tr>
<tr><td></td><td colspan="2">3 700-4 200
FIXED
FIXED-SATELLITE (space to-Earth)
MOBILE except aeronautical mobile</td></tr>
<tr><td colspan="3">* * * * *</td></tr>
<tr><td>4 500-4 800</td><td colspan="2">FIXED
FIXED-SATELLITE (space-to-Earth) 5.441
MOBILE 5.440A</td></tr>
</table>

Reasons: Report ITU-R M.2109 and the studies performed by the JTG show that sharing between IMT and FSS in these frequency bands is not feasible.