

WRC-15 Agenda Item 10

With Respect to IMT in bands above 6 GHz

IWG-2 members were not able to reach consensus on a proposal for WRC-15 agenda item 10 regarding IMT in bands above 6 GHz and, therefore, forwards two views on how the FCC should handle this matter.

View A is supported by Alcatel-Lucent, AT&T, Ericsson, Intel Corporation, Motorola Mobility, Nokia Solutions and Networks, Samsung, Sprint Corporation, Telecommunications Management Group Inc. and Verizon.

View B is supported by EchoStar Corporation, Inmarsat, Intelsat, Iridium, Lockheed Martin Corp., New Wave Spectrum Partners, SES Americom, The Boeing Company, and ViaSat.

VIEW A

VIEW A: Support Agenda Item 10 Proposal for IMT in bands above 6 GHz

View A (attached) provides a WRC-15 agenda item 10 proposal seeking a WRC-19 agenda item for the identification for IMT in bands above 6 GHz, in order to help meet the tremendous demand for mobile broadband.

View A is supported by Alcatel-Lucent, AT&T, Ericsson, Intel Corporation, Motorola Mobility, Nokia Solutions and Networks, Samsung, Sprint Corporation, Telecommunications Management Group Inc. and Verizon.

Mobile broadband plays a crucial role in providing access to businesses and consumers worldwide. According to ITU statistics, “Mobile broadband remains the fastest growing market segment, with continuous double-digit growth rates in 2014.”¹ Mobile broadband users are also demanding higher data rates and are increasingly using mobile devices to access audio-visual content.

The mobile industry continues to drive technological innovations in order to meet these evolving user demands. In early 2012, ITU-R began to develop “IMT for 2020 and beyond”. Research and development efforts from both industry as well as academia are facilitating the use of spectrum in bands above 6 GHz for mobile broadband. These efforts span the globe, including research in Europe, China, Japan, Korea, and the United States.

Regional preparatory groups including the Asia Pacific Preparatory Group, CITELEC PCC II, and Europe’s Conference Preparatory Group PTA have recognized the need for additional spectrum for terrestrial IMT in higher frequency bands and are actively developing potential proposals for WRC-19.

The United States has been one of the leading countries in the deployment of advanced mobile services. The “Presidential Memorandum: Unleashing the Wireless Broadband Revolution” emphasizes the importance of additional spectrum for mobile broadband: “America’s future competitiveness and global technology leadership depend, in part, upon the availability of additional spectrum.” The success of the recent AWS-3 auction provides compelling objective evidence of the vital importance of spectrum for mobile broadband. America’s future competitiveness and technology leadership is also vitally important. The European Union, China, Japan, Korea, and others are moving forward to facilitate the deployment of “5G” systems including in bands above 6 GHz. It is crucial that the United States, as a global technology leader, join these efforts.

In order to help the US attain these important objectives, the View A proponents modeled the proposal in attachment A on the Resolution **423 (WRC-12)**, which was successfully utilized by WAIC for WRC-15 agenda item 1.17). This structure focuses studies on bands which already have an existing allocation to the relevant service.

¹ <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>, p1.

Given the growing demand for mobile broadband and the technological advances which will be able to support IMT networks in higher frequency bands, it is essential to ensure the timely availability of additional spectrum in bands above 6 GHz to support the future growth of IMT in the years 2020 and beyond.

Therefore, the companies listed above urge FCC to consider the attached WRC-15 agenda item 10 proposal supported by View A, which proposes a WRC-19 agenda item to consider the identification of frequency bands for the terrestrial component of IMT in bands above 6 GHz.

This proposal does not address the status of Resolution 233 (WRC-12). The proponents note that View B proposes to suppress Resolution 233 (WRC-12). However, the proponents of View A propose that the US await the results of WRC-15 agenda item 1.1 before determining a position on studies on the bands below 6 GHz. It would be ill-advised to prejudge the outcome of the WRC regarding those lower bands.

**ATTACHMENT TO VIEW A:
Agenda Item 10 Proposal Regarding IMT in Bands above 6 GHz**

Draft

United States of America

PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda item 10

10 to recommend to the Council, items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention;

Introduction

Since 2000, terrestrial IMT networks have served a crucial role in providing access to businesses and consumers worldwide. According to ITU statistics, “Mobile cellular subscriptions will reach almost 7 billion by end 2014, corresponding to a penetration rate of 96%,” including a penetration rate of 90% in developing countries and 121% in developed countries.¹

IMT networks contribute to global economic and social development. IMT systems provide a wide range of multimedia applications, including telemedicine, teleworking, distance learning, and public protection and disaster relief, with even more applications envisioned. IMT systems also help reduce the digital divide between urban and rural areas, including underserved communities.

¹ <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>, p 3.

The growth rate of mobile broadband has been phenomenal. According to ITU statistics, “Mobile broadband remains the fastest growing market segment, with continuous double-digit growth rates in 2014. By end 2014, the number of mobile-broadband subscriptions will reach 2.3 billion globally, almost 5 times as many as just six years earlier (in 2008).”²

In order to meet this growing demand as well as to provide increased capabilities to users, IMT systems have continually incorporated technological improvements, from the first IMT-2000 networks to IMT-Advanced. In early 2012, ITU-R began to develop “IMT for 2020 and beyond”, setting the stage for research activities that are emerging around the world. ITU-R studies include Report ITU-R M.2320, which provides information on the technology trends of terrestrial IMT systems considering the time frame 2015-2020 and beyond, [PDN] Report ITU-R M.[IMT.ABOVE 6 GHz] which studies the technical feasibility of IMT in bands above 6 GHz, and [PDN] Recommendation ITU-R M.[IMT.VISION] which describes the framework and overall objectives of the future development of IMT for 2020 and beyond.

The year 2020 is seen as a beginning for next generation of mobile broadband communication systems beyond IMT-Advanced, which currently are known as ‘IMT for 2020 and beyond’ systems, sometimes also referred to as ‘5G’. Globally, mobile industries, academia, governments, ITU-R and regional groups are conducting research activities to address the growth in traffic and user demands for year 2020 and beyond. Correspondingly, frequency allocation and regulatory frameworks issues also need to be addressed in parallel so that the development of the technology can proceed.

Research efforts globally on “5G” systems are progressing.³ In Asia, the Chinese 5G initiative, named ‘IMT-2020’, is a combination of three government agencies and has established eight working groups with the aim of promoting the development of 5G technologies in the country, while Japan has “2020 and Beyond Ad Hoc” (20B AH) group focused on delivering commercial 5G services at the 2020 Olympic Games and in South Korea, the ‘5G Forum’ was founded by the Ministry of Science, ICT (information and communications technology) and Future Planning (MSIP) to lead the development of 5G mobile wireless communications and to commercialize 5G technology by 2020. In Europe, work includes the METIS 2020 Project as well as the 5G Infrastructure Public Private Partnership (5G PPP), a joint European Commission/industry effort which will facilitate research into solutions, architectures, technologies and standards for 5G infrastructure. In the US, academic and research efforts on 5G are also underway (e.g. 5G Brooklyn and 5G Forum). In the U.S., major research efforts are underway at a number of academic institutions as well as industry.⁴ In addition, manufacturers worldwide have invested resources in research and development efforts, while mobile operators have begun “lab trials”.

Within the scope of the wide ranging development for future mobile broadband, and in addition to the work on-going for IMT in the lower frequency bands, considerable research has been carried out by various organizations on a global scale on the feasibility of terrestrial IMT in

² <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>, p1.

³ More information is available at <https://gsmaintelligence.com/research/?file=141208-5g.pdf&download>, Appendix A.

⁴ For example, see <http://brooklyn5gsummit.com/> and <http://brooklyn5gsummit.com/>.

spectrum above 6 GHz. The corresponding results presented at various workshops and conferences have been positive towards the feasibility of utilizing higher frequencies for terrestrial IMT and mobile broadband usage. It is expected that usage of higher frequencies will be one of the key enabling components of future IMT as the state of the art in technological developments unlocks the spectrum above 6 GHz. In the US, the FCC has already expressed interest in the use of higher frequency bands for mobile broadband services.

Regional preparatory groups have also recognized the need for additional spectrum for terrestrial IMT in higher frequency bands and are actively developing potential proposals for WRC_19. For example, in the Asia Pacific Preparatory Group, multiple administrations have proposed a WRC-19 agenda item for IMT in higher frequency bands. Within Europe, the Conference Preparatory Group PTA is also progressing a proposal for an agenda item at WRC-19 to identify spectrum for IMT applications in frequency bands above 6 GHz. In the UK, Ofcom issued a Call for Inputs on “Spectrum above 6 GHz for future mobile communications” to inform their strategy on these bands, including international discussions on bands above 6 GHz that could be considered at the World Radiocommunications Conference (WRC) in 2019.⁵

Given the growing demand for mobile broadband and the technological advances which will be able to support IMT networks in higher frequency bands, it is essential to ensure the timely availability of additional spectrum in bands above 6 GHz to support the future growth of IMT in the years 2020 and beyond. Therefore, the United States proposes a WRC-19 agenda item to consider the identification of frequency bands for the terrestrial component of IMT in bands above 6GHz.

Proposal:

MOD USA/10/1

RESOLUTION 806 (WRC-15)

Agenda for the 2019 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2015),

ADD USA/10/2

1.[IMT] to consider spectrum requirements and identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications, in accordance with Resolution [IMT] (WRC-2015);

⁵ http://stakeholders.ofcom.org.uk/binaries/consultations/above-6ghz/summary/spectrum_above_6_GHz_CFI.pdf

Reasons: To support the requirement for additional spectrum being identified for the terrestrial component of International Mobile Telecommunications (IMT)

ADD USA/10/3

RESOLUTION [IMT] (WRC-15)

Consideration of identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications

The World Radiocommunication Conference (Geneva, 2015),

considering

- a) that International Mobile Telecommunications (IMT) systems have been the main method of delivering wide area mobile broadband applications;
- b) that IMT and other mobile broadband systems contribute to global economic and social development by providing a wide range of multimedia applications, such as mobile telemedicine, teleworking, distance learning and other applications;
- c) that in all countries where terrestrial IMT systems are deployed there is a continuing significant growth in the number of users of IMT systems and in the quantity and rate of data carried, the latter being driven to a large extent by audiovisual content;
- d) that IMT and other mobile broadband systems have helped reduce the digital divide between urban and rural areas, including underserved communities;
- e) that in many developing markets the main delivery mechanism for broadband access is expected to be through mobile devices;
- f) that adequate and timely availability of spectrum and supporting regulatory provisions is essential to support the future growth of IMT and other mobile broadband systems;
- g) that there is a need to continually take advantage of technological developments in order to increase the efficient use of spectrum and facilitate spectrum access;
- h) that harmonized worldwide bands and harmonized frequency arrangements for IMT and other mobile broadband systems are highly desirable in order to achieve global roaming and the benefits of economies of scale; and
- i) the need to protect existing services when considering changes to the table of frequency allocations;

recognizing

- a) that there is a fairly long lead time between the identification of frequency bands by world radiocommunication conferences and the deployment of systems in those bands, and timely availability of spectrum is therefore important to support the development of IMT and other terrestrial mobile broadband applications;
- b) that IMT systems have been in operation since the year 2000;

- c) the use of relevant parts of the spectrum by other radiocommunication services, many of which involve significant investment in infrastructure or represent significant societal benefit, and the evolving needs of these services,
- d) that IMT encompasses both IMT-2000 and IMT-Advanced collectively, as described in Resolution ITU-R 56;
- e) that Resolution ITU-R 57 addresses the principles for the process of development of IMT-Advanced, and Question ITU-R 77-7/5 considers the needs of developing countries in the development and implementation of IMT;
- f) that Question ITU-R 229-3/5 seeks to address the further development of IMT;
- g) that Recommendations ITU-R M.1457 and ITU-R M.2012 contain detailed specifications of the terrestrial radio interfaces of IMT-2000 and IMT-Advanced, respectively,
- h) that Report ITU-R M.2320 provides information on the technology trends of terrestrial IMT systems considering the time frame 2015-2020 and beyond.
- i) that [PDN] Report ITU-R M.[IMT.ABOVE 6 GHz] studies the technical feasibility of IMT in bands above 6 GHz
- j) that [PDN] Recommendation ITU-R M.[IMT.VISION] describes the framework and overall objectives of the future development of IMT for 2020 and beyond.

resolves

that WRC-19 consider, based on the results of ITU-R studies in *invites ITU-R 1* and *2*, possible identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications.

invites ITU-R

- 1) to conduct, and complete in time for WRC-19, the appropriate studies to determine the spectrum requirements for the terrestrial component of IMT in bands above 6 GHz;
- 2) to conduct sharing and compatibility studies, based on the results of *invites ITU-R 1*, to determine appropriate frequency bands
- 3) when conducting studies in accordance with *invites ITU-R 2*, to consider
 - i) frequency bands within existing allocations to the mobile service on a primary basis in the table of frequency allocations on a regional or global basis, other than those in No. **5.340**.
 - ii) additional frequency bands if spectrum requirements cannot be met in frequency bands studied under *invites ITU-R 3 i*)

invites administrations

to participate actively in these studies by submitting contributions to ITU-R.

ATTACHMENT

**PROPOSAL FOR ADDITIONAL AGENDA ITEM FOR CONSIDERATION OF
IDENTIFICATION OF FREQUENCY BANDS FOR THE TERRESTRIAL
COMPONENT OF INTERNATIONAL MOBILE TELECOMMUNICATIONS (IMT) IN
BANDS ABOVE 6 GHZ, INCLUDING APPROPRIATE MOBILE ALLOCATIONS IF
NEEDED, TO FACILITATE THE DEVELOPMENT OF MOBILE BROADBAND
APPLICATIONS**

Subject: Proposed Future WRC Agenda Item for WRC-2019 for consideration of identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications

Origin: United States of America

Proposal: *To consider the identification of frequency bands for the terrestrial component of International Mobile Telecommunications (IMT) in bands above 6 GHz, including appropriate mobile allocations if needed, to facilitate the development of mobile broadband applications*

Background/reason:

ITU statistics show that “Mobile broadband remains the fastest growing market segment, with continuous double-digit growth rates in 2014. By end 2014, the number of mobile-broadband subscriptions will reach 2.3 billion globally, almost 5 times as many as just six years earlier (in 2008).”¹ In order to meet this growing demand as well as support new user capabilities, terrestrial IMT networks continue to incorporate technological advances.

In early 2012, ITU-R began to develop “IMT for 2020 and beyond”, setting the stage for research activities that are emerging around the world, including support for networks in bands above 6 GHz. Technological advances described in PDN Report [IMT.ABOVE 6 GHz] can facilitate the development and deployment of IMT networks to help meet this growing capacity demands for mobile broadband. Given the growing demand for mobile broadband and the technological advances which will be able to support IMT networks in higher frequency bands, it is essential to ensure the timely availability of spectrum in bands above 6 GHz to support the future growth of IMT in the years 2020 and beyond. There are currently no bands above 6 GHz identified for IMT.

¹ <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>

Radiocommunication services concerned: Mobile Service

Indication of possible difficulties: None foreseen.

Previous/ongoing studies on the issue: Report ITU-R M.2320 provides information on the technology trends of terrestrial IMT systems in 2015-2020 and beyond. ITU-R Working Party 5D is finalizing studies on [PDN] Report ITU-R M.[IMT.ABOVE 6 GHz] which studies the technical feasibility of IMT in bands above 6 GHz and [PDN] Recommendation ITU-R M.[IMT.VISION] which describes the framework and overall objectives of the future development of IMT for 2020 and beyond.

Studies to be carried out by: ITU-R
WP5D

with the participation of: other WPs as required

ITU-R Study Groups concerned: SG 5 and others as needed

ITU resource implications, including financial implications (refer to CV126): This proposed agenda item will be studied within the normal ITU-R procedures and planned budget. As the responsible group on IMT studies, ITU-R WP 5D usually has meetings three times a year which last 6 days each.

Common regional proposal: Yes/No

Multicountry proposal: Yes/No

Number of countries:

Remarks

VIEW B

VIEW B: Opposition to Document IWG-2/069 and Presentation of Alternative Strategy for IMT in Frequency Bands Above 6 GHz for WRC-19 and Beyond

WAC members setting forth this view include operators, manufacturers, suppliers, and customers of satellite systems and networks that operate in frequency bands above 6425 MHz (“> 6 GHz”). For the reasons provided below, we have great difficulty with the proposal for a new IMT agenda item presented by the mobile community in Document IWG-2/069. It simply is not possible for the ITU-R to conduct the necessary sharing and compatibility studies covering existing services (including planned usage) in potentially all RF spectrum above 6 GHz within the next WRC cycle. We envision that the United States would be better served by taking a two-WRC approach, with the agenda for WRC-19 to be focused on establishment of IMT station and system characteristics in bands above 6 GHz, and a preliminary agenda item for WRC-23 that takes a balanced approach relative to the protection of existing services in specific bands/band ranges. EchoStar Corporation, Inmarsat, Intelsat, Iridium, Lockheed Martin Corp., New Wave Spectrum Partners, SES Americom, The Boeing Company, and ViaSat support this view.

I. The WRC-19 Agenda Item proposed in Document IWG-2/069 requires significant refinement and must take existing services into account.

- The Draft Proposal in View A is too open-ended.

Although View A generally identifies frequency bands with existing allocations to the mobile service as the target for proposals, the scope of the spectrum included in this categorization is extremely broad. First, between 6425 MHz and 100 GHz (roughly 94 GHz of spectrum), 59.375 GHz is allocated to the mobile service on a primary basis in at least one region, and in all three regions for the vast majority of bands. Each band is also allocated on a primary basis to other services – including most of the bands allocated to satellite services. Second, the draft resolution contemplates that the studies could extend to the remaining 37% of frequency bands between 6425 MHz and 100 GHz, as well as all mobile and non-mobile spectrum above 100 GHz, if the spectrum requirements of the mobile industry cannot be met in 60,000 MHz of spectrum below 100 GHz already allocated to mobile on a primary basis.

It is not possible for the ITU-R to conduct the broad studies contemplated by the View A proposal within the time allotted for the next WRC preparation cycle. In particular, it is unreasonable to expect industry representatives of existing services to expend time and resources to conduct studies in this wide swath of spectrum, particularly when (as discussed in more detail below) the technical characteristics of the proposed IMT services remain undefined.

- The Draft Proposal in View A fails to take existing services into account.

Resolution 233 from WRC-12 reflected a balance between the interests of the mobile broadband advocates and existing services. View A should be modified to reflect such a balance. Specifically, Resolution 233 called for protection of existing services, and sharing and compatibility studies involving services with existing allocations in both the potential candidate bands and adjacent bands (taking into account current/planned usage by existing services and studies already performed in the ITU-R). The draft resolution in View A fails to address

protection of existing services, adjacent band allocations, current/planned usage by existing services, and studies already performed in the ITU-R.

- The Draft Proposal in View A fails to propose suppression of Resolution 233 (WRC-12) and thus would result in reopening determinations made regarding bands below 6 GHz.

The proposed resolution and agenda item in View A for WRC-19 do not propose the suppression of Resolution 233 (WRC-12), and effectively would result in reopening determinations that WRC-15 will have already made about bands below 6 GHz. In other words, all spectrum below 6 GHz would be subject to further consideration and study for the next cycle as well. We believe that the studies under Resolution 233 are complete, and that WRC-15 will have considered all that there is to consider in bands below 6 GHz. While it is possible that a new, specific agenda item for a limited number of discrete bands from the potential candidate frequency band list in the CPM Report could be needed as a result of incomplete deliberations on proposals to WRC-15, that can be determined at the WRC. In the meantime, any future agenda item proposal on IMT/mobile broadband from the United States must include the suppression of Resolution 233 (WRC-12).

- The Draft Proposal in View A contains background text that does not belong in a putative U.S. proposal to a world radiocommunication conference.

The background section of the draft proposal in Document IWG-2/069 contains a number of passages that do not seem appropriate for inclusion in a WRC proposal. Specifically, statements describing views and positions ostensibly being developed in other countries and regional groups preparing for WRC-15 are not appropriate for a United States proposal. Any such statements belong, if anywhere, in a delegation position paper. We note that this is not a case where there is CPM text or existing studies to point toward.

* * *

For all of these reasons, the Commission should reject the draft AI 10 proposal for spectrum above 6 GHz that is presented in View A.

II. It is premature for the United States to propose an agenda item that envisions IMT/mobile broadband allocations and/or identifications in bands above 6 GHz at WRC-19.

- There are no IMT/mobile broadband system/station characteristics that can be used in studies in the coming ITU-R cycle.

With Resolution 233 (WRC-12), there was the general understanding that IMT/mobile broadband system and station characteristics (particularly for operations in the bands below 3 GHz, but also for the 3-6 GHz range) would be able to be input to enable the ITU-R to undertake meaningful sharing and compatibility studies with existing services in time for WRC-15. This expectation, for whatever reason, never fully was met by the IMT/mobile broadband community in the JTG 4-5-6-7 process. As a result, many key studies that should have provided valuable technical input for the deliberations to be undertaken at WRC-15 were either not completed or

contain conclusions that are rendered less than definitive by the lack of clarity on the IMT/mobile broadband side.

If studies move forward as envisioned in the draft resolution in View A, the same deficiencies would exist during the coming study cycle. Critically, there are no identifiable characteristics for IMT/mobile broadband at this time, as recognized in View A. The proponents acknowledge that they are still at the stage of determining the very “feasibility of utilizing higher frequencies for terrestrial IMT and mobile broadband usage.” The U.S. itself is not even that far, with the FCC issuing a notice of inquiry focusing on the feasibility of mobile broadband use of spectrum above 24 GHz just last year. The View A proponents include in their resolution a pair of *considerings* that focus on work, incomplete even in Working Party 5D, that remains at the feasibility and vision quest stages of IMT mobile broadband development in bands above 6 GHz.

In order to meaningfully address the proposals for IMT/mobile broadband, it is essential to have representative technical characteristics of the proposed services, as well as a reasonably tailored range of the spectrum bands that are being proposed for IMT and mobile broadband usage. It is unreasonable to expect that the complex core questions on sharing and compatibility will be able to be answered in the ITU-R in time for WRC-19 in the complete absence of this type of information. We do not think it is feasible given the current status of WP 5D that has been reported by the mobile community. No new IMT identification/allocation can even be considered for a WRC agenda until a reasonable set of IMT/mobile broadband technical characteristics are available for use in meaningful studies, which there is no reason to believe will occur in time for WRC-19, particularly as “5G” has not even been defined. Thus, even with a balanced resolution that properly addresses the protection of existing services (including planned usage), the View A proposal for a WRC-19 agenda item should be rejected as premature.

III. One possible way forward on IMT/mobile broadband spectrum above 6 GHz would be for the U.S. to propose dividing the matter between two WRCs – by bringing an agenda item to WRC-19 that calls for identification of spectrum requirements and system characteristics for IMT/mobile broadband, and by bringing a proposal for a preliminary agenda item for WRC-23 to address sharing and compatibility studies with existing services in specific frequency bands (and adjacent bands, as appropriate).

We recognize the importance of mobile broadband to U.S. national telecommunications policy and broader national interests. Agenda Item 1.1 for WRC-15 ostensibly has been a top national priority, and we and other existing services have engaged constructively in the multi-year effort to find a set of solutions that works. However, as we note above, it is incumbent upon the IMT/mobile broadband community to provide reliable and stable IMT/mobile broadband system/station characteristics needed to allow our industry, and others, to conduct the necessary studies, which is unlikely to be feasible in the WRC-19 cycle.

It is undisputed that system design and characteristic development for IMT/mobile broadband systems that could use spectrum above 6 GHz is not particularly advanced. Indeed, none of the View A proponents has asserted that there are reliable and stable IMT/mobile broadband

system/station characteristics to use in ITU-R sharing and compatibility studies with existing services.

To allow progress to be made, and to utilize the time and resources of existing services and the ITU-R in an efficient and effective manner, we believe that it might be appropriate for the U.S. to take a longer view on potential actions to accommodate IMT/mobile broadband in spectrum above 6 GHz. In this regard, the interval between WRC-15 and WRC-19 would be used exclusively for the development of elements of the types that are found in *resolves to invite ITU-R 1 of Resolution 233 (WRC-12)*. This means studying IMT/mobile broadband spectrum requirements in bands above 6 GHz, technical and operational characteristics of IMT systems, evolving needs for IMT and other terrestrial mobile broadband applications; the needs of developing countries; and the time frame within which spectrum would be required. Inter-service considerations would not be part of this study program, and thus all work could be performed exclusively within Working Party 5D (or perhaps in Working Parties 5D and 5A), and not require inter-service deliberations. We understand that much of this work is underway to some degree now in Working Party 5D, and that WRC-15 action would not be needed to initiate work not yet started or progress work underway. We are prepared, however, to endorse a suitable WRC-19 agenda item to this end, feeding into the preliminary WRC-23 agenda item to be proposed in parallel, to establish firmly our national intent to proceed in some fashion.

For WRC-23's preliminary agenda, we envision specifying a balanced sharing/compatibility study approach with respect to existing services of the type found in Resolution 233. However, in contrast to Resolution 233, our concept of a preliminary agenda item for WRC-23 would include specific frequency ranges (expressed as XXX-YYY MHz/GHz) that are to be determined based on the results of study from the WRC-19 agenda item.

We believe this is a fair, constructive, and efficient approach that balances multiple interests is the best path forward given the nascent state of IMT/mobile broadband technology in bands above 6 GHz. We would be happy to develop this idea further within the WRC-15 delegation in the weeks and months to come, and hope it is something the FCC could support.