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## WAC Informal Working Group (IWG)-2

### United States of America

#### PROPOSALS FOR THE WORK OF THE CONFERENCE

##### Agenda item 8.2

8.2 *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, taking into account Resolution 806 (WRC-07),*

##### **Introduction**

Currently approximately 5 billion of the world's estimated 6.8 billion people are connected to global telecommunication networks via mobile terminals. Mobile telephony and mobile broadband demand and consumption have been growing at an unprecedented pace. Currently, 3G technologies are providing services to more than one billion subscribers worldwide and, by 2013, the number of 3G subscribers is projected to reach approximately 2.4 billion. Estimates of worldwide wireless data traffic indicate that it grew by 5,800 percent during the two year period from 2006 to 2008 with slightly decreased rate of 4,500 percent forecast over the next few years. Current projections indicate that by 2014 monthly worldwide mobile data traffic will exceed the total for all of 2008. One 3G carrier in the United States reported in February 2010 that its mobile broadband traffic had grown more than 5,000 percent over the past three years. This strong demand creates an ever-expanding market for 3G-based devices, including 3G feature phones, smartphones, PDAs, tablets, e-readers, gaming devices, consumer electronics devices, and laptops.

For the majority of individuals in developing countries, the first, and the only access to the Internet, is via mobile networks. Other mobile broadband consumers will demand a user experience that is similar to services and applications that they currently experience in wired office and home environments. Thus, the increasing demand for higher data rate services with comparable quality of service to the global mobile broadband consumer will place increasing pressure on finding spectrum resources to support the growth of a variety of mobile applications.

Expanded access to mobile broadband will potentially trigger the creation of innovative new businesses, provide cost-effective connections in developing countries and under-served areas,

increase productivity, improve public safety, and allow for the development of mobile telemedicine, telework, distance learning, and other new applications that will transform lives.

### *Healthcare*

Information technology plays a key role in improving health and health care delivery. Mobile broadband can improve care quality, safety, efficiency, and reduce disparities in health care. Increased access to broadband will serve to engage patients and families in managing their health and enhance care coordination.

Broadband access might help ensure adequate privacy and security of health information. Increased access to broadband wireless systems can dramatically improve the collection, presentation and exchange of health care information, and provide clinicians and consumers the tools to transform care. Technology alone cannot heal, but when appropriately incorporated into care, technology can help health care professionals and consumers make better decisions, become more efficient, engage in innovation, and understand both individual and public health more effectively.

### *Education*

Broadband can be an important tool to help educators, parents and students meet major challenges in education. A country's economic welfare and long-term success depend on improving learning for all students, and broadband-enabled solutions hold tremendous promise to help reverse patterns of low achievement and lack of access. With broadband, students and teachers can expand instruction beyond the confines of the physical classroom and traditional school day. Broadband can also provide more customized learning opportunities for students to access high-quality, low-cost and personally relevant educational material. Broadband can improve the flow of educational information, allowing teachers, parents and organizations to make better decisions tied to each student's location, needs and abilities. Improved information flow can also make educational product and service markets more competitive by allowing school districts and other organizations to develop or purchase higher-quality educational products and services.

### *Economic Growth*

Broadband and the Internet make it possible for small businesses to reach new markets and improve their business processes. They have also become a critical pathway for individuals to gain skills and access careers. It is a core infrastructure component for local communities seeking to attract new industries and skilled work forces. As a result, small businesses, workers, and communities must have the broadband infrastructure, training and tools to participate and compete in a changing economy. Broadband can help every community.

### *Government Services*

Smarter use of broadband can facilitate a vast change in government. Like private companies, government can make its services available 24 hours a day, seven days a week, 365 days a year. Broadband-enabled online services can create paths across government's bureaucratic silos so that someone wanting to access unemployment benefits can deal with the local government and the federal government at the same time. Broadband holds the potential to move all government forms online, eliminating paperwork. Broadband allows for online tutorials for simple government services, which can help free government employees to focus on the most

complicated cases. And broadband can increase efficiency by increasing the speed and depth of cooperation across departments and across different levels of government.

#### *Civic Engagement*

Civic engagement starts with an informed public, and broadband can help by strengthening the reach and relevance of mediated and unmediated information. Broadband can enable government to share unmediated information more easily. Providing more information and data to the public about the processes and results of government can strengthen the citizenry and its government. Broadband can also empower citizens to engage their government through new broadband-enabled tools. Broadband has already increased access to information and revolutionized the way citizens interact with each other.

#### *Public Safety*

There are significant benefits, including cost efficiencies and improved technological advancement, if the public safety community can increasingly use applications and devices developed for commercial wireless broadband networks. Ultimately, this system must be flexible, allowing public safety entities to forge incentive-based partnerships with commercial operators and others. This system will allow the public safety community to realize the benefits of commercial technologies, which will reduce costs and ensure the network evolves.

It is envisioned that the above type of future service offerings will open up new opportunities for connectivity, allowing consumers to be situation-conscious, to multi-task, and to access a wide range of telecommunication services supported by packet-based mobile and fixed networks. The mobile broadband manufacturing industry is evolving towards next generation highly efficient radiocommunication technologies, coupled with an all-IP open Internet network architecture. Through technological innovations such as MIMO and adaptive beam forming antenna systems, the efficiency of spectrum usage has continuously improved. However, the evolution of the technologies will not provide all the necessary capacity to meet the growing demand.

As the use of mobile broadband technologies expands, however, existing mobile service allocations may not be adequate to meet the growing demand. Furthermore, the benefits of global or regional harmonization of frequency bands may not be realized unless adequate spectrum is identified for this purpose. One administration has estimated that a total of 500 MHz of additional spectrum may need to be available for mobile broadband use within the coming 10 years.

For these reasons the United States proposes that the ITU-R undertake studies to determine the amount of spectrum needed to support mobile broadband systems, including IMT, and report the results of these studies to the next WRC for its regulatory actions as required, including new allocations and identifications.

#### *Attachment*

## ATTACHMENT

### **Proposal for an additional agenda item to consider spectrum requirements, regulatory provisions, and allocations to support mobile broadband systems, including the terrestrial component of International Mobile Telecommunications**

**Subject:** Proposed WRC-15 agenda item to determine the amount of spectrum needed to support the development of mobile broadband systems, including IMT, and modify the Radio Regulations as required, including new allocations and identifications

**Origin:** United States of America

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**Proposal:** The United States proposes that the ITU-R undertake studies to determine the amount of spectrum needed to support mobile broadband systems, including IMT, and report the results of these studies to the next WRC for regulatory actions as required, including new allocations and identifications.

**Background/reason:** Currently approximately 5 billion of the world's estimated 6.8 billion people are connected to global telecommunication networks via mobile terminals. Mobile telephony and mobile broadband demand and consumption have been growing at an unprecedented pace. Currently, 3G technologies are providing services to more than one billion subscribers worldwide and, by 2013, the number of 3G subscribers is projected to reach approximately 2.4 billion. Estimates of worldwide wireless data traffic indicate that it grew by 5,800 percent during the two year period from 2006 to 2008 with slightly decreased rate of 4,500 percent forecast over the next few years. Current projections indicate that by 2014 monthly worldwide mobile broadband data traffic will exceed the total broadband data traffic for all of 2008. One 3G carrier in the United States reported in February 2010 that its mobile broadband traffic had grown more than 5,000 percent over the past three years. This strong demand creates an ever-expanding market for 3G-based devices, including 3G feature phones, smartphones, PDAs, tablets, e-readers, gaming devices, consumer electronics devices, and laptops.

It is envisioned that future IMT service offerings will open up new opportunities for connectivity, allowing consumers to be situation-conscious, to multi-task, and to access a wide range of telecommunication services supported by packet-based mobile and fixed networks. The mobile broadband manufacturing industry is evolving towards next generation highly efficient radiocommunication technologies, coupled with an all-IP open Internet network architecture. Through innovations like MIMO and adaptive beam forming antenna systems, interference mitigation, multiple and aggregated carriers, power control, repeaters and scheduling schemes, etc., efficiency of spectrum usage is continuously improving. However, there are practical limitations to the ability to increase spectrum efficiency.

The foundation to permit realization of this vision relies on forward looking regulatory policies, implementing technological advances (such as IMT-Advanced) enabling operators to further increase their capability and capacity within their licensed spectrum, reducing operator and user costs to achieve global affordability and enhancing access to the spectrum needed to support the mobile broadband world of the future.

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This agenda item will provide an opportunity to determine the need for spectrum, and to identify suitable spectrum for this purpose through sharing studies of candidate frequency bands. The United States proposes that the ITU-R undertake the studies called for in Resolution [Proposed 2016] below to determine the amount of spectrum needed to support the development of mobile broadband systems, including IMT, and report the results of these studies to the next WRC for its regulatory actions as required, including new allocations and identifications.

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***Radiocommunication services concerned:*** Mobile, Fixed, Broadcasting, Satellite, Radiolocation

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***Indication of possible difficulties:*** Any spectrum likely to be considered as candidates to support mobile broadband systems is equally likely to be encumbered by other mobile, fixed, broadcast, radiolocation and satellite services.

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***Previous/ongoing studies on the issue:*** Work has been conducted in the past (Reports ITU-R M.2072 and M.2078) and is currently ongoing within Working Party 5D to document the trends and spectrum requirements to support IMT systems for the next 10 years (2012-2022). Several studies have been performed in SG 5 on sharing between mobile broadband technologies and existing services in a number of bands.

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***Studies to be carried out by:*** WP5D

***with the participation of:*** Study Groups 4, 5, 6 and 7

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***ITU-R Study Groups concerned:*** 5

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***ITU resource implications, including financial implications (refer to CV126):*** Work can be completed within the existing resources of the ITU-R Study Groups, placing no additional burden on ITU-R

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***Common regional proposal:*** No      ***Multicountry proposal:*** No  
***Number of countries:***

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***Remarks***

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## RESOLUTION 806 (Rev.WRC-12)

### Agenda for the 2015/16 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2012),

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**ADD** USA/#A###/#

**#.XYZ** to consider the spectrum requirements and possible regulatory actions, including additional allocations to the mobile service on a primary basis **in the frequency range 400 - 6 000 MHz**, to accommodate the development of mobile broadband systems, including IMT, based on the results of ITU-R studies, in accordance with Resolution [USA-0#] (WRC-12)

**Reasons:** Available spectrum to meet consumer demand for high-data rate, high-quality mobile services may not be adequate to meet the growing worldwide demand. This agenda item will consider regulatory actions, including additional allocations to the mobile service on a primary basis, to meet this demand.

**ADD** USA/###

#### RESOLUTION [USA-0#](WRC-12)

**Consideration of spectrum requirements, regulatory provisions, and additional allocations to the mobile service for mobile broadband systems, including the terrestrial component of International Mobile Telecommunications (IMT), in the frequency range 400 – 6 000 MHz**

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The World Radiocommunication Conference (Geneva, 2012),

*considering*

- a) that, currently approximately 5 billion of the world's estimated 6.8 billion people are connected to global telecommunication networks via mobile terminals;
- b) that mobile telephony and mobile broadband demand and consumption have been growing at an unprecedented pace;
- c) that currently, there are more than one billion mobile broadband subscribers worldwide and, by 2013, the number of mobile broadband subscribers is projected to reach approximately 2.4 billion;
- d) that the number of mobile broadband subscriptions has grown steadily and in 2008 surpassed those for fixed broadband;

- e) that current projections indicate that by 2014, the monthly worldwide broadband mobile data traffic will exceed the annualized total broadband data traffic for all of 2008;
- f) that broadband applications on mobile devices have increased the bandwidth requirements and expectations of mobile users;
- g) that the availability of new and innovative telecommunication devices has spurred demand for wireless access to the Internet;
- h) that expanded mobile broadband access is expected to trigger new business opportunities, provide the potential for cost-effective connections in developing countries and underserved areas, increase productivity and improve public safety;
- i) that expanded mobile broadband access also is expected to allow for the development of mobile telemedicine, telework, distance learning, and other new applications;
- j) that for global operation and economies of scale, which are key requirements for the success of mobile communications systems, it is desirable to agree on harmonized or common operational, technical and spectrum parameters;
- k) that Question ITU-R 77-6/5 addresses the needs of developing countries in the development and implementation of mobile radiocommunication technology;
- l) that mobile broadband and International Mobile Telecommunications (IMT) services are available in most countries of the world;
- m) that Question ITU-R 238-1/5 addresses broadband wireless access systems for the mobile service;
- n) that Question ITU-R 229-2/5 addresses the future development of IMT;
- o) that IMT encompasses both IMT-2000 and IMT-Advanced collectively as described in Resolution ITU-R 56;
- p) that the technical characteristics of IMT are specified in ITU-R and ITU-T Recommendations, including Recommendation ITU-R M.1457 which contains the detailed specifications of the terrestrial radio interfaces of IMT-2000 and Recommendation ITU-R M.[IMT.RSPEC] which contains the detailed specifications of the terrestrial radio interfaces of IMT-Advanced;
- q) that the parameters and their associated values to be used in sharing and compatibility studies involving IMT systems are given in Report ITU-R M. 2039;
- r) that ITU-R Reports M.2031, M.2109, M.2110, M.2111, M.2112, and M.2113 contain sharing and compatibility studies between IMT systems and other systems and services;
- s) that ITU-R Report S.2199 contains sharing and compatibility studies between IMT systems and systems of the fixed satellite service in the 3400-3600 MHz band;
- t) that the ITU recognizes IMT systems, as broadband wireless access systems;
- u) that the radio interface standards of broadband wireless access systems operating in the mobile services below 6 GHz are specified in ITU-R Recommendation ITU-R M.1801;
- v) that the characteristics of broadband wireless systems operating in the mobile service for use in sharing studies are specified in ITU-R Report M. 2116;

- w) that the ITU-R Study Group 5 is reviewing and updating M-Series Reports and Recommendations on the characteristics and framework of mobile broadband including IMT systems, taking into account the current state of wireless technology;
- x) that adequate spectrum availability is a prerequisite for the success of the continuing development of mobile broadband systems, including IMT;
- y) that there is a long lead time between the identification of frequency bands by World Radiocommunication Conference and the deployment of systems in those bands;
- z) that it is therefore timely to study demand, technical, spectrum and regulatory issues related to the future development of mobile broadband systems, including IMT,

*recognizing*

a) the following bands have been identified for IMT in the Radio Regulations (RR) and that this identification does not preclude the use of these bands by any application of the services to which they are allocated or identified and does not establish priority in the Radio Regulations:

<u>Band (MHz)</u>	<u>Footnotes identifying the band for IMT</u>
<u>450-470</u>	<u>5.286AA</u>
<u>698-960</u>	<u>5.313A, 5.317A</u>
<u>1 710-2 025</u>	<u>5.384A, 5.388</u>
<u>2 110-2 200</u>	<u>5.388</u>
<u>2 300-2 400</u>	<u>5.384A</u>
<u>2 500-2 690</u>	<u>5.384A</u>
<u>3 400-3 600</u>	<u>5.430A, 5.432A, 5.432B, 5.433A</u>

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b) the bands that are allocated in the Radio Regulations to services that support safety-of-life systems and operations:

- c) the need to protect existing services when considering frequency bands for possible additional allocations for any service;
- d) the economic benefits that the further development of mobile broadband is expected to bring to countries;
- e) the role that mobile broadband could play in bridging the digital divide, especially in underdeveloped or rural areas of the world;
- f) the need to balance commercial wireless service use of the radio spectrum with other priorities established by individual administrations;
- g) that any additional frequency bands allocated to the mobile service to support mobile broadband applications, including IMT, should not preclude the use of these frequencies for other mobile service applications or establish priority in the Radio Regulations;

- h) the time necessary to develop and agree on the technical, operational, spectrum and regulatory issues associated with the continuing enhancement of mobile services;
- i) the need, particularly in many developing countries and countries with large geographic areas, for the cost-effective implementation of rural broadband services;
- j) the increasing importance of ubiquitous coverage and the particular advantages of lower frequency bands for these purposes;
- k) that bands at higher frequencies are also required in order to provide sufficient bandwidth to meet future demand;
- l) that there may be advantages to identifying new frequency bands adjacent to, or in close proximity to, currently allocated/identified bands,

*noting*

- a) that globally, mobile broadband deployments are overwhelmingly utilizing the technologies contained in ITU-R Recommendations, and these technologies continue to be enhanced;
- b) that through these enhancements, efficiency of spectrum usage is continuously improving. However, there are practical limitations to the ability to increase spectrum efficiency; and spectrum efficiency improvements alone are not likely to address the projected spectrum demand,

*resolves*

1 to invite the ITU-R to study technical and operational issues relating to the development of mobile broadband systems, including IMT, in the frequency range 400 – 6 000 MHz, and develop Recommendations and Reports as required;

2 to invite the ITU-R to study the expected characteristics of mobile broadband systems including IMT, and develop Recommendations and Reports as required;

3 to invite the ITU-R to report, in time for WRC-15, on the results of studies on the spectrum requirements and potential frequency ranges suitable for the development of mobile broadband systems, including IMT;

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4 that WRC-15 consider, based on the results of ITU R studies, the spectrum requirements and possible regulatory actions, including additional allocations in the frequency range 400 – 6 000 MHz, to support the development of mobile broadband systems, including IMT,

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*invites the Director of the Telecommunication Development Bureau*

to draw the attention of the Telecommunication Development Sector to this Resolution,

*invites administrations*

1 to contribute to the studies mentioned in *resolves* 1 and 2 above by, inter alia, providing information on their use of the existing services in candidate bands;

2 to participate in the studies by submitting contributions to ITU-R,

*requests the Secretary-General*

to bring this Resolution to the attention of the International Maritime Organization (IMO), International Civil Aviation Organization (ICAO), World Meteorological Organization (WMO) and other international and regional organizations concerned.

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