Submission to the Telecom Regulatory Authority of India with regard to Consultation No. 12/2014 on "Delivering Broadband Quickly: What do we need to do?"

October 21, 2014

The Cable and Satellite Broadcasting Association of Asia (CASBAA) is an industry-based trade association dedicated to the promotion of multi-channel television via cable, satellite, broadband and wireless video networks across the Asia-Pacific region. Member organizations include some 120 Asia-based companies building, operating, and providing content for pay-TV systems, and include operators of cable, satellite, mobile and IPTV systems. Members are physically located in 17 countries and regions in the Asia-Pacific area, and provide television services to over 500 million Asian homes, including 149 million homes in India.

CASBAA welcomes TRAI's consultation on Delivering Broadband Quickly and supports TRAI's effort to hasten the rollout of broadband services to Indian homes. Many pay TV industry actors including various CASBAA members have direct roles to play promoting the adoption of broadband services in India.

Cable multiple systems operators (MSOs) in US, UK and other markets provide a significant proportion of total last mile domestic and small and medium enterprise business internet capacity through the adoption of DOCSIS cable modems. In previous years, CASBAA has exhorted TRAI to encourage and incentivize Indian cable operators to roll out such technologies, by for example according "information infrastructure" status to cable network investments. Recently, a number of MSOs have begun significant rollouts of DOCSIS 3.0, enabling up to 50Mbit/s internet services to homes served.

Broadcasters and content providers have been making their content available to subscribers on a multiplicity of wireless and other IP-connected devices, as have pay TV operators, encouraging demand for broadband services.

Various broadcasters and content providers also have significant roles to play in enhancing computer literacy, by providing computing specific information, news and training content. Precedents for this include the BBC Computer Literacy Project of the early 1980's, which included television series, development of a computer used extensively in education across the UK for over 15 years and pioneering (in that pre-world-wide-web era) software broadcasting, as well as laying the foundation for the today's most widely deployed mobile microprocessor architecture (ARM), in use in 95% of smart phones, 80% of digital cameras, and 35% of all electronic devices.

Whether the "last mile" for television service to India's hundreds of millions of connected consumers is provided by cable, broadband, wireless or satellite technology, the "back-end" distribution of television programming to nearly all of these homes is provided by satellite services

in the C-band spectrum[1]. Satellite C-band transmission is a bedrock foundation of consumption of news, entertainment and sports by the Indian television viewing population, as well as for VSAT networks and other critical communications services..

For this reason, we believe it essential to correct certain fallacies and misinformation provided to the TRAI during this Broadband Consultation process. The submission of the GSM Association, in particular, uses the occasion of this Consultation to appeal for Indian support at the ITU for taking a substantial portion of this C-band spectrum from the uses already being made of it by hundreds of millions of Indians and allocating it for IMT[2]. We believe that the wide use currently being made of this spectrum for the benefit of the Indian population is a convincing reason for the Indian government to oppose "harmonized" designation of the C-band frequencies for IMT.

Background on Satellite C-band in India

- The "C-band" (3.4-4.2GHz in space-to-Earth, or "downlink" direction) is one of a limited number of frequency bands used by satellite operators to provide critical communications services around the world. The C-band is particularly important as the laws of physics make it uniquely robust for providing services in sub-equatorial regions, including much of India, which often suffer from very heavy rainfall. At present, more than 180 telecommunications geostationary satellites provide services with a total of more than 2000 transponders using the C-band frequencies. For these reasons of physics, C-band is irreplaceable and not substitutable.
- To place the current applications in jeopardy would be an irresponsible act. Satellite operators examined the claims of the mobile industry in this regard, and explained why many of those claims are incorrect in contributions to the ITU-R JTG 4-5-6-7[3].
- Investment: In the last 5 years the satellite industry spent $15 billion launching 52 C-band satellites; another 35 new satellites will be launched by 2015, worth a further $10 billion. These figures do not take into account the substantial investment in terrestrial and other related equipment by satellite service providers and end users that use C-band for their communication needs. In India, a very large investment in C-band satellites – including in the disputed 3.4-3.6GHz band – has been made by the government, through ISRO and the Department of Space. For TRAI to recommend a changed future for C-band would send the wrong signals and undermine these government and industry efforts in India[4].
- Complementarity: The GSMA submission refers to provision of satellite services in other frequency bands, including the Ku-band (already in wide use in India) and the Ka-band (not yet in broad commercial use in India). That submission implies that unspecified "recent technological improvements" have made these frequency bands economically and technologically substitutable for the C-band. In tropical regions, this is manifestly untrue. The higher-frequency bands provide complementary services, and especially direct-to-

[1] A recent study reported that of roughly 800 TV channels distributed in India, 720 are distributed by C-band satellites. See Euroconsult, "Assessment of C-Band Usage in Asian Countries," which can be downloaded from www.casbaa.com/CBandAssessment .

[2] See Letter from Sandeep Karanwal, Director, GSMA India to Arvind Kumar, Advisor (Networks, Spectrum and Licensing), Telecom Regulatory Authority of India, dated 14 October 2014.

[3] See document 4-5-6-7/681, available at: http://www.itu.int/md/R12-JTG4567-C-0681/en

[4] CASBAA also notes the importance space issues played in the agenda of the recent visit to the United States by Prime Minister Narendra Modi.

home television broadcasting, but there are no technological improvements that have diminished the importance of C-band distribution to every cable and satellite operator in India[5] or to the criticality of reliable service provision through C-band.

- Capacity Crunch: Indeed, the C-band and Ku-band spectrum available to Indian companies is being so heavily used that supply shortages are very much in evidence. In a global sense, both C-band and Ku-band are fully committed and occupied. If transponder capacity becomes available in any part of the band, it is quickly taken up by satellite service providers. The supply-demand balance for C-band transponders over India was explored last year at our request by PwC, and the results published in a booklet entitled "Easing India's Capacity Crunch: An Assessment of Supply and Demand for Television Satellite Transponders.[6]" PwC argues that the spectrum available for Indian satellite services should be increased, and not decreased by re-allocating C-band for IMT uses.

Sharing of the C-band with Ubiquitous IMT Devices is Not Possible

We wish to correct the record with respect to a misleading statement in the GSMA submission. That document states that "ITU-R JTG 4-5-6-7 has concluded sharing and compatibility studies in relation to these bands, and results from these studies show that they are feasible for use by IMT in many circumstances, and remained candidate bands for consideration for WRC-15."

Quite on the contrary, the reports agreed and promulgated by the ITU-R JTG 4-5-6-7 came to the conclusion that sharing would not be a practical proposition because of very large separation distances which would be required between satellite Earth stations and IMT base stations in the receive direction (see Draft New Report ITU-R [FSS-IMT C-BAND DOWNLINK][7]). The conclusions of this report are particularly pessimistic for countries with a large number of ubiquitously deployed C-band earth stations, and India is such a country. It is also notable that the Report contains information on real interference experienced by C-band users in Bangladesh when broadband access systems were deployed in the same band. The unfortunate experience in Bangladesh could occur in India if C-band is opened to mobile broadband applications.

Demand for Harmonized Spectrum for IMT

The satellite industry does not dispute the fact that mobile broadband use is growing and needs spectrum but we do dispute the fact that new spectrum identifications are needed, and question how much spectrum is really needed for such applications.

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[5] The all-weather reliability of C-band satellite services also makes other parts of the spectrum unrealistic substitutes for uses in banking, finance, health, education, disaster relief and public security which are documented in the Euroconsult "Assessment of C-Band Usage in Asian Countries." This assessment may be downloaded from www.casbaa.com/CBandAssessment .

[6] We believe that the Authority is very familiar with the problems of Indian users in obtaining adequate satellite capacity, but for the record, this study may be downloaded from www.casbaa.com/publications/satellite.

[7] The document "DRAFT NEW REPORT ITU-R [FSS-IMT C-BAND DOWNLINK]: Sharing studies between International Mobile Telecommunication-Advanced systems and geostationary satellite networks in the fixed-satellite service in the 3 400-4 200 MHz and 4 500-4 800 MHz frequency bands in the WRC study cycle leading to WRC-15" is Annex 17 to the Joint Task Group 4-5-6-7 Chairman's Report; it is available at http://www.itu.int/md/R12-SG05-C-0126/en, and we attaching a copy as Appendix 1 to this submission.

- The mobile industry is not using IMT spectrum already identified and available.

In anticipation of the growth of the mobile industry, the ITU has already, in an internationally harmonized manner, allocated and/or recommended a certain amount of spectrum for use by IMT. Around the world, less than 50% of this spectrum is licensed and even less is in use. We provide for the Authority's information, as Appendix 2 to this submission, a recent global study of how much of the available spectrum is actually being used by the IMT industry. It follows that very large amounts of new spectrum can be made available for mobile broadband services without a harmonized international decision to identify C-band frequencies for this purpose.

- IMT spectrum predictions are grossly exaggerated as a result of vendor over-enthusiasm.

Submissions by the mobile industry regularly make sweeping statements about the necessity for huge amounts of additional spectrum. The Authority's Consultation Paper makes reference to projections by the ITU. However, the models used by the mobile industry are not impartial. Indeed, the ITU-R Working Party 5D[8] model for predicting spectrum requirements uses population density and traffic usage figures that are many times greater than any real world figures[9]. As a result of questioning in the UK, the proponents of advice as it has been presented to Ofcom have been forced to admit an error of 1000 times overstatement of traffic assumptions, causing a correction of their input to the regulator. This has also provoked the Australian Regulator, the ACMA to do its own independent modelling and verification, currently in progress.

As such the model is not representative of any country, nor is it useful for assessing IMT spectrum demand in any country. An illustration of how the ITU-R Working Party 5D's prediction model applies to India is given in Appendix 3 of this submission, from which can be seen that the model estimation of e.g. India's urban population is 2 to 4 times higher than the government's real urban population forecasts for 2020.

For the Authority's information, we attach as Appendix 4 a presentation on the problems with the ITU-R model; if further information on our analysis and critique is required we will be happy to provide it.

We note that Report ITU-R M.2290, which contains the ITU Working Party 5D estimation of IMT spectrum requirements for IMT also contains results for India, using an original methodology, suggesting a need for requirement of 300 MHz by 2017 and an additional requirement of another 200 MHz by 2020. (If the detail of the calculations could be made available, CASBAA would be pleased to review and comment on the estimation of the spectrum requirements for India.)

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[8] ITU-R Working Party 5D is responsible for the development and support for IMT within ITU-R and is attended largely by the mobile industry.

[9] The ITU-R WP 5D model uses a bottom-up prediction based on population density and traffic use to determine traffic densities in each of the service environments. Benchmarking the population and traffic density figures in the model against accepted forecasts of population, mobile data growth and usage reveal traffic densities in the model are at least 100 times higher than any realistic benchmarks.

- Other solutions exist to address IMT growth requirements.

Mobile operators prefer to take new spectrum from other users, including the satellite and broadcasting industries and the military, rather than making the investments needed to use their existing spectrum more efficiently.

The mobile industry faces an economic decision given that from time-to-time, e.g. during the recent Olympics or FIFA World Cup, there is a surge of traffic, a so-called "peak-load" that puts enormous stress on existing networks as users exchange massive amounts of data. In such a situation mobile operators can make more efficient use of their spectrum by sub-dividing cells or they can build more radio sites: both these options would solve their problem but they require investment. GSMA's submission makes oblique reference to this, when it notes that assignment of large swathes of internationally-harmonized spectrum will "lower the cost of equipment." The cheapest option that allows this wealthy industry to avoid investing money into their networks is to ask for more spectrum. Taking spectrum used by other industries such as satellite costs mobile operators nothing but has a massive knock-on cost to society in terms of services lost.

CASBAA would be happy to provide further information in support of our views in this comment, if desired.