



October 15, 2007

To,

**The Chairperson,
Telecom Regulatory Authority of India**
Mahanagar Doorsanchar Bhavan,
Jawaharlal Nehru Marg,
New Delhi : 110 002

Dear Sir,

Sub: Response to Consultation paper No. 9/2007 on Issues relating to Mobile TV Services

Intel™ Corporation welcomes the opportunity to respond to the Telecom Regulatory Authority of India's (TRAI) Consultation Paper on Issues relating to Mobile TV services dated September 18, 2007.

Intel™ Corporation is the world's largest semiconductor manufacturer and a leader in technical innovation. Intel™ is also a leading manufacturer of communications and networking chips and equipment.

Intel Corporation commends the Telecom Regulatory Authority of India (TRAI) for striving to create a spectrum policy and planning framework which will foster the adoption and growth of new wireless technologies such as WiMAX and DVB-H, to the benefits of India and global citizens.

Intel agrees with several ideas expressed in the recommendations, and find the document thorough and well written. As one example ,you importantly note that the rapid advancement of technology is creating a convergence of technologies and services that should be enabled through a flexible technology neutral and service neutral approach to spectrum and license assignment. This approach will enable consumers to reap the benefits of the rapid technological innovations that are occurring in the communications industry and will promote the economic and social benefits that broadband can deliver.

In the bands most promising for global harmonization, Intel recommends that regulators allocate sufficient spectrum for wireless uses such as Mobile TV and Broadband Wireless Access (BWA) and allot flexible large bandwidth licenses.



Then licensees, in response to market forces, will then be free to achieve the benefits of innovation and economies of scale and interoperability through the adoption of international standards. They will have an incentive to converge on one technology where the benefits of convergence are greater or adopt a new technology where those benefits are greater. Please find below answers to select questions from this consultation.

Our response to the issues raised in the consultation paper is given in the document enclosed herewith.

We would be pleased to provide you with any additional information that you may need and would certainly welcome the opportunity to discuss the matters in person and clarify any queries that may arise.

Yours Sincerely,

(A N Murugappan)
Manager - Technical Policy & Standards
Corporate Technology Group
Mobile - 9871073339



Chapter VII: Issues for consultation

Based on the discussion in the previous chapters, the following issues have emerged for consultation on the policy framework for the mobile TV service in India. As already pointed out, these issues are relevant for mobile TV service providers excluding CMTS and UASL licensees.

- 1. Whether the technology for mobile television service should be regulated or whether it should be left to the service provider.***

Intel believes in a technology neutral approach to spectrum management, and as such the selection of the technology and service should be left to the service provider.

This would be consistent with the approach adopted by the TRAI and the Government in other telecom licenses.

In the context of rapid changes in technology and evolution of new and better ways to implement services, it would be prudent to let the key stakeholder decide on the choice of technology based on his business case. It would also be difficult to predict the development and capabilities of new technologies that may evolve. Leaving the choice to the operator would motivate them to choose an effective technology and also which would cater to the future needs.

Also, encouraging the operators to choose open standards based technology would be beneficial because they help to promote economies of scale, and ensure broader interoperability in the market place including roaming across a large geography.

- 2. If the technology is to be regulated, then please indicate which technology should be chosen and why. Please give reasons in support of your answer.***

Please see response to Question 1 above. The technology choice should be left to the service provider.



3. *What will be the frequency requirement for different broadcast technological standards for terrestrial and satellite mobile television transmission in India?*

There are various frequency requirements for different broadcast technology standards. Intel recommends that the spectrum assignment, as previously mentioned, be done in a technology and service neutral manner, allowing the operator or service provider to choose the best technology.

In the UHF bands for example, the assignment is also attractive for general broadband wireless technologies and applications, so we encourage India to assign the spectrum in the UHF bands in large national bandwidths to facilitate the use of BWA as well.

It would be preferable to offer the spectrum in blocks of 7 or 8 MHz (based on the channelization) and let the service providers bid for the blocks as required based on their business model. Giving the option to bid for multiple blocks would enable the serviced provider realize the benefits of economies of scale by being able to broadcast a large number of channels in a given infrastructure.

4. *Which route would be preferable for mobile TV transmission - dedicated terrestrial transmission route or the satellite route? Should the mobile TV operator be free to decide the appropriate route for transmission?*

Yes, the mobile TV operator should be given the opportunity to decide the most appropriate route for their transmission.

Giving the choice to choose the option of either terrestrial , satellite or as the case may be even a combination of satellite and terrestrial route would enable the operator build the network most suited to the business needs and also achieve the best coverage.



5. *How should the spectrum requirements for analogue/ Digital/ Mobile TV terrestrial broadcasting be accommodated in the frequency bands of operation? Should mobile TV be earmarked some limited assignment in these broadcasting bands, leaving the rest for analog and digital terrestrial transmission?*

No. The assignment should be made as flexible as possible, to allow for either mobile or terrestrial service to be deployed. As a background, the world is currently going through the beginning stages to convert terrestrial analog TV to digital TV. It is recommended that, in India any new assignments, although technology neutral in nature, be encouraged for digital transmissions. This will provide the most efficient use of the spectrum, and allow for a multitude of choices for service providers.

A market led technology neutral approach would enable the operator decide the best and most economic use of the scarce spectrum resources. This is already beginning to happen in Europe. For instance, in Germany, they are assigning a national mobile TV multiplex, in the same band as terrestrial TV.

6. *In the case of terrestrial transmission route, how many channels of 8 MHz should be blocked for mobile TV services for initial and future demand of the services as there are nearly 270 TV channels permitted under down linking guidelines by Ministry of Information and broadcasting?*

No channels should be 'blocked' or dedicated to a particular technology or use. The spectrum and in particular the UHF spectrum for example, should be assigned flexibly, in a manner which allows the operator to obtain the amount of spectrum they need to deploy their intended service.

Offering the spectrum in blocks and letting the service providers bid for multiple blocks would enable them bid for the required spectrum as per their business model/ required capacity to accommodate the desired number of channels.



7. *Whether Digital Terrestrial Transmission should be given priority for the spectrum assignment over mobile TV, particularly in view of the fact that the Mobile TV all over the world is essentially at a trial stage.*

Intel again believes that no priority should be given to the spectrum assignment, but to allow the operator to obtain the spectrum they need and use it for their optimum application.

8. *Whether the frequency allocation for the mobile TV should be made based on the Single Frequency network (SFN) topology for the entire service area or it should follow Multi Frequency Network (MFN) approach.*

While adopting a SFN topology may be more spectrally efficient, this however should not be a constraint in adopting MFN based on the spectrum resources available.

9. *Whether frequency spectrum should be assigned through a market led approach - auctions and roll out obligation or should there be a utilization fee?*

A market led approach based on auction and roll out obligations is recommended. Auctions will enable the market decide the optimum price of the spectrum. Incorporating a roll out obligation would ensure that the operator attains the desired coverage within the given time frame. The auction based approach also would eliminate any non serious players who may otherwise try to compete for the spectrum.

10. *What should be the eligibility conditions for grant of license for mobile television services?*

The conditions should be specified in such a manner that it enables an open and fair method of evaluation for choosing the licensees.

11. *Whether net worth requirements should be laid down for participation in licensing process for mobile television services? If yes, what should be the net worth requirements for participation in licensing process for mobile television services?*

No Comments



12. *What should be the limit for FDI and portfolio investment for mobile television service providers?*

Intel recommends promoting conditions to allow for more robust foreign investment, similar to other major telecom services. Encouraging higher limits of FDI would enable larger inflow of investments and help new technology infrastructure to be built.

13. *What should be the tenure of license for the mobile television service providers?*

Intel believes that a minimum of 10 years with the ability to renew is a sufficient consideration.

14. *What should be the license fee to be imposed on the mobile television service providers?*

No specific comment, however generally we encourage fees to be low, so as to not inhibit the roll out of the beneficial services to the public. In addition, fees beyond the initial spectrum auction fee should be avoided.

15. *Whether in view of the high capital investment and risk associated with the establishment of mobile television service, a revenue share system would be more appropriate?*

No comment

16. *Whether any Bank Guarantee should be specified for licensing of the mobile television service providers. If yes, then what should be the amount of such bank guarantee? The basis for arriving at the amount should also be indicated.*

No comment

17. *Whether the licenses for mobile television service should be given on national/ regional/ city basis.*

Intel believes generally that national licenses should be provided. However, considering coverage over linguistically homogenous geographies, assigning a mix of few national and few regional ones (geographically large in scope) could be considered.