

**Bharti Airtel Ltd.**

India & South Asia

Airtel Center, Plot No. 16,

Udyog Vihar, Phase - IV,

Gurugram - 122 015

www.airtel.in

Call +91 124 4222222

Fax +91 124 4248063



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Dated: 03<sup>rd</sup> November, 2017.

**To,**  
**Shri Syed Tausif Abbas,**  
**Advisor (Networks, Spectrum and Licensing),**  
Telecom Regulatory Authority of India,  
Mahanagar Doorsanchar Bhawan,  
Jawahar Lal Nehru Marg,  
New Delhi - 110 002.

**Subject: Response to Consultation Paper on "In Flight Connectivity (IFC)".**

**Reference: TRAI Consultation paper dated 29<sup>th</sup> September, 2017.**

Dear Sir,

This is with reference to your above mentioned consultation paper. In this regard, please find enclosed our response for your kind consideration

Thanking you,

Yours Sincerely,  
For **Bharti Airtel Limited.**

A handwritten signature in blue ink, appearing to read 'R P Gandhi', with a horizontal line extending from the end.

**Ravi P. Gandhi**  
**Chief Regulatory Officer**

**Enclosed: As mentioned above**

## **Bharti Airtel Response's Response to TRAI's Consultation Paper on "In Flight Connectivity"**

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At the outset, we thank the Hon'ble Authority for providing us with an opportunity to submit our views on this Consultation Paper.

The Indian aviation sector<sup>1</sup> presently handles an annual traffic of over 85 million domestic passengers and 50 million international passengers. The total passenger traffic continues to rise annually, with multiple airlines competing to provide best-in-class In-Flight Connectivity (IFC) services. The Indian aviation sector<sup>2</sup> is expected to become one of the top 5 fastest growing markets globally with an addition of 322 million new passengers by the year 2035. In fact, it is likely to displace United Kingdom to be third largest aviation market by the year 2025.

Today's<sup>3</sup> flyers are increasingly looking for voice and data connections anywhere, 24/7 – driven by the need to stay in touch with family, enjoy entertainment and to maintain critical business communications. They want In-Flight broadband connectivity equal to what they have experienced from terrestrial networks. In fact, these<sup>4</sup> expectations have increased the demand for fast, seamless telecom connectivity (voice, video, and data) to the point where an airline's IFC capability has become a key competitive advantage. Therefore, IFC services are being offered by airlines in Africa, Asia, Australia, Europe, the Middle East and South America.

IFC services are yet to be permitted in India and as a result, it presents a significant disadvantage for Indian companies and millions of Indian passengers. Therefore, it is essential that IFC services are introduced at the earliest to give a competitive edge to Indian companies by delivering In-Flight entertainment, communication services and other value added services to the air passengers. These services will not only meet the expectations of the air passengers, but will also open a new potential revenue stream for the Indian Telecom Service Providers (TSPs).

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<sup>11</sup> <http://dgca.nic.in/dgca/dgca-ind.htm>

<sup>2</sup> <http://www.iata.org/pressroom/pr/Pages/2016-10-18-02.aspx>

<sup>3</sup> <http://docplayer.net/28034625-Using-air-to-ground-lte-for-inflight-ultra-broadband.html>

<sup>4</sup> <http://www.tmcnet.com/tmc/whitepapers/documents/whitepapers/2015/11529-using-air-to-ground-lte-in-flight-ultra.pdf>

This consultation paper is currently focused on the provision of IFC services through satellite only, which is bulky and expensive solution. Additionally, capacity using satellite systems is limited and exhibits high latency, especially when serving a large number of continental aircrafts in a limited geographic area.

We firmly believe that air-to-ground (A2G) connectivity is a better alternative solution to satellite connectivity because of the smaller size, less weight, and lower cost of the equipment involved for In-Flight service deployment. A2G network is based on cellular broadband technologies which utilizes ground stations to connect with aircrafts to provide an ultra-broadband backhaul infrastructure for providing high-bandwidth In-Flight connectivity services to passengers and crew. While their customers and employees alike enjoy these services, the airlines will benefit from cost efficiencies and competitive offerings. In addition, these A2G solutions would have minimum impact on regulatory aspects (such as Lawful Interception).

The A2G connectivity can be provided by existing TSPs under their UAS Licence/Unified Licence (Access Service Authorization) and over their licensed spectrum. Since A2G connectivity would be provided over licensed spectrum, it would not cause any interference either with other TSPs or with Aircraft/ Airport infrastructure. Therefore, it is critical that the upcoming policy for IFC should consider A2G solutions.

As per the above context, we hereby put forth our views on the questions raised by the Authority in this Consultation Paper.

**Q.1 Which of the following IFC services be permitted in India?**

**a. Internet services**

**b. Mobile Communication services (MCA service)**

**c. Both, Internet and MCA**

**Airtel's Response:**

1. We recommend that the Hon'ble Authority should allow both the MCA and Internet services so that the passengers in domestic, international and overflying flights over Indian airspace can stay connected and make use of the telecommunication services.
2. Users should get the same experience (throughput & latency) of the telecommunication services provided by In-Flight connectivity as they get from the terrestrial mobile and broadband networks. The IFC solutions should strive to provide similar quality and comply with security standards as defined for terrestrial telecom services.

**Q.2 Should the global standards of AES/ESIM, shown in Table 2.1, be mandated for the provision of AMSS in Indian airspace?**

**Airtel's Response:**

1. In-Flight connectivity can be provided either by using satellite communications or through terrestrial A2G communications. For solutions based on satellite communications, global standards of AES/ESIM should be mandated for the provisions of Aeronautical Mobile Satellite Service (AMSS) in Indian airspace. This will ensure that services in India are aligned with the global standards.
2. However, these standards should not be applicable to the IFC solutions based on A2G technology since it is based on the 3GPP standards that are used in terrestrial mobile communications. A2G does not use Ku-band and Ka-band which are used for satellite communications; instead, it can utilize 4G/LTE bands that can provide higher throughput and lower latency compared to satellite technologies.
3. Solutions deployed for In-Flight connectivity should make use of simpler, lighter and less-expensive aircraft equipment, which can be deployed on the aircraft within a short period of an overnight stop.

**Q.3 If MCA services are permitted in Indian airspace, what measures should be adopted to prevent an airborne mobile phone from interfering with terrestrial cellular mobile network? Should it be made technology and frequency neutral or restricted to GSM services in the 1800 MHz frequency band, UMTS in the 2100 MHz band and LTE in the 1800 MHz band in line with EU regulations?**

**Airtel's Response:**

1. We recommend that In-Flight connectivity services should be made technology and frequency neutral. TSPs should make use of their existing licensed spectrum holdings to provide IFC connectivity, which would ensure no interference issues to exist between terrestrial mobile networks and aircraft and airport's equipments and systems. The Government may put forth the required rules and regulations on the type of equipment – size, power limits/radiation levels, shape, weight, etc. Such rules would also ensure faster deployment of IFC services.
2. Further, inter-circle roaming among TSPs will be critical for IFC as the device on-board would latch on the Public Land Mobile Network (PLMN) of different circles/TSPs during the flight and cannot have disconnections during these inter-circle handovers. Since TSPs are already permitted to enter into intra-circle and inter-circle roaming agreements with each other, this should not be any issue.

**Q.4 Do you foresee any challenges, if the internet services be made available 'gate to gate' i.e. from the boarding gate of the departure airport until the disembarking gate at the arrival airport?**

**Airtel's Response:**

We recommend that TSPs holding Unified Licence with Access Service Authorization or UAS Licence should provide the IFC services. Since the TSP would be using the licensed spectrum for both terrestrial and IFC, they would not have challenges in providing 'gate to gate' services. It would be like users coming from Wi-Fi zone inside the aircraft to the regular 4G/3G network while on the ground.

**Q.5 Whether the Unified Licensee having authorization for Access Service/Internet Service (Cat-A) be permitted to provide IFC services in Indian airspace in airlines registered in India?**

**Q.12 Do you agree that the permission for the provision of IFC services can be given by making rules under Section 4 of Indian Telegraph Act, 1885?**

### **Airtel's Response:**

1. We recommend that MCA services should be provided by licensed TSPs holding a UAS Licence/Unified Licence (Access Service Authorization).
2. MCA services are not new as they are the same type of telecommunication services which are being provided by TSPs over the land. Under the UAS Licence/Unified Licence (Access Service Authorization), the access services<sup>5</sup> cover collection, carriage, transmission and delivery of voice and/or non-voice messages over the Licensee's network in the designated service area. The Licensee can also provide Internet Telephony and other internet services, including IPTV, broadband services and triple play, i.e., voice, video, and data.
3. Since the provision of telecommunication services over the ground and air is same, the offering of IFC services should be permitted under the telecom licence granted under Section 4 of ITA, 1885.

**Q.6 Whether a separate category of IFC Service Provider be created to permit IFC services in Indian airspace in airlines registered in India?**

**Q.7 Whether an IFC service provider be permitted to provide IFC services, after entering into an agreement with Unified Licensee having appropriate authorization, in Indian airspace in airlines registered in India?**

### **Airtel's Response:**

1. As explained in our response to Q5, we recommend that any entity which intends to offer IFC services in India, should obtain a Unified License (Access Service Authorization).
2. We do not suggest for any separate category of IFC service provider under the Unified Licence to be provisioned since the telecommunication services will remain the same on ground and air. Further, TSPs offering IFC services would extensively make use of their terrestrial communications networks and hence, they are in best position to offer the IFC services under the same telecom licence/authorization and over licensed

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<sup>5</sup> Unified Licence – Access Services (AS) means telecommunication service provided to subscribers by means of a telecommunication system for the conveyance of voice or non-voice messages through wired or wireless telegraphy on the network of the Access Service Provider. The subscriber shall have identity indicated by a number or any other address approved by the Licensor. The subscriber shall be registered and authenticated by the network of Access Service Provider. Access Service does not cover broadcasting of any voice or non-voice messages. However, Cell Broadcast is permitted only to the subscribers of the service. Scope of Service provided under the Access Service Authorization shall be governed by the terms and conditions as provided in Chapter VIII.

spectrum under which they are offering the telecommunication services on the ground.

**Q.8 If response to Q.7 is YES, is there any need for separate permission to be taken by IFC service providers from DoT to offer IFC service in Indian airspace in Indian registered airlines? Should they be required to register with DoT? In such a scenario, what should be the broad requirements for the fulfillment of registration process?**

**Q.9 If an IFC service provider be permitted to provide IFC services in agreement with Unified Licensee having appropriate authorization in airlines registered in India, which authorization holder can be permitted to tie up with an IFC service provider to offer IFC service in Indian airspace?**

**Airtel's Response:**

1. As explained in our response to Q5 and Q6, we recommend the entities to have a Unified License (Access Service Authorization) for providing IFC services in India.
2. We do not recommend any other regulatory framework, such as separate permission or registration or authorization under the Unified Licence, due to the reasons stated above.

**Q.10 What other restrictions/regulations should be in place for the provision of IFC in the airlines registered in India.**

**Airtel's Response:**

1. Since, the provision of IFC services is no different from the provision of telecom services over land, regulatory requirements under the Unified License or related to licensed spectrum such as quality of service (QoS), tariffs, interconnection, roaming, security, monitoring of traffic and privacy of data can be formulated by TRAI along the lines of the mobile networks installed by Unified licensees on the ground.
2. However, the Government may put in place some rules and regulations to ensure that there is no interference with the aircraft navigation system. TSPs may also notify the Civil Aviation Ministry before offering IFC services to domestic and international airlines and follow their rules to ensure that the use of equipment on board including the passengers' handsets to ensure no interference is caused with the aircraft's equipment and systems.

**Q.11 What restrictions/regulations should be in place for the provision of IFC in the foreign airlines? Should the regulatory requirements be any different for an IFC service provider to offer IFC services in Indian airspace in airlines registered outside India vis-à-vis those if IFC services are provided in Indian registered airlines?**

**Airtel's Response**

We believe that the rules for the provision of IFC services to domestic and international airlines should be the same.

**Q.13 Which of the options discussed in Para 3.19 to 3.22 should be mandated to ensure control over the usage on IFC when the aircraft is in Indian airspace?**

**Airtel's Response:**

Since the provision of IFC services can only be done by TSPs and over their licensed spectrum, they should comply with the security requirements related to the monitoring of traffic and accordingly, the Government may place the rules and regulations if required.

**Q.14 Should the IFC operations in the domestic flights be permitted only through INSAT system (including foreign satellite system leased through DOS)?**

**Q.15 Should the IFC operations in international flights (both Indian registered as well as foreign airlines) flying over multiple jurisdictions be permitted to use either INSAT System or foreign satellite system in Indian airspace?**

**Airtel's Response:**

1. We are of the view that the IFC operations if provided through satellite communications, in the domestic & International flights, be permitted only through INSAT system (including foreign satellite system leased through DOS) in Indian Airspace. Beyond the Indian Airspace, the aircrafts can be permitted to use either INSAT or international satellite systems.
2. For IFC connectivity through A2G solutions, such provisions would not be applicable as these services would be provided using A2G base stations using an extension of 3GPP technology/networks deployed by TSPs. In A2G solutions, the customer premise equipment deployed on-board would be able to connect to the Indian Cellular network when the aircraft is in Indian airspace and roam on international networks when the aircraft is beyond Indian airspace.

3. Both satellite & A2G connectivity-based solutions should facilitate Lawful Interception of the user traffic generated on Wi-Fi network and/or MCA traffic generated on-board of the aircraft, but not on the satellite/A2G transport link. Generally, A2G has the advantage of being a ground-based solution within India. So A2G solutions would have not any issues which otherwise may arise with the use of foreign satellite operators. Foreign airlines/satellite providers could be asked to route user traffic through a node in India to allow Lawful Interception.

**Q.16 Please suggest how the IFC service providers be charged in the following cases? (a) Foreign registered airlines. (b) Indian registered airlines.**

**Airtel's Response:**

1. In a market-driven economy, commercial freedom and engagement are critical for attracting investments and to run a business by delivering the considerable value proposition to end customers. The freedom to explore various commercial arrangements for IFC services will encourage the entities to develop innovative services and sustainable business models.
2. IFC agreements (like other enterprise deals) between TSPs and Airlines or any 3<sup>rd</sup> party may be conducted in many ways such as fixed fee deals, monthly charges and variable charges on the basis of traffic. Such agreements would be dependent on bandwidth, latency, speed, and network KPIs. Thus, we believe that market forces should be allowed to develop various business models as per their needs.
3. For providing seamless connectivity to international passengers, Indian TSPs shall also sign roaming agreements with foreign operators so that their customers can roam onto our network. Similarly, Indian passengers can enjoy the similar connectivity while abroad.
4. Needless to say that any revenue earned from IFC services by TSPs would be subjected to the license fee and spectrum usage charges.

**Q.17 Should satellite frequency spectrum bands be specified for the provisioning of the IFC services or spectrum neutral approach be adopted?**

**Q.18 If stakeholders are of the view that IFC services be permitted only in specified satellite frequency bands, which frequency spectrum bands should be specified for this purpose?**

**Airtel's Response:**

1. We believe that the existing licensed spectrum is sufficient to meet the demand for IFC services. In fact, the capacity of existing TSPs is such that the current and expected IFC traffic will remain relatively a small proportion of the total traffic demand and, therefore, in itself will not drive increasing spectrum requirements. Nevertheless, TSPs could always buy additional licensed spectrum in a particular band via auction route.
2. Therefore, IFC services should be provided over licensed spectrum and TSPs should be free to consider the bands which are best suited to deliver these services in the most efficient and productive manner.
3. Further, TSPs should be permitted to use any satellite frequency bands for the provision of IFC services, if they choose to use satellite backhaul connectivity.