

# **M.A. Space and Telecommunications Law**

## **NALSAR University of Law**

### **Hyderabad India.**

**Telecommunication Laws in India**  
**Contemporary Issues and Challenges**  
**Dr. Mohanavelu**

**Meeting Links:**

<https://nalsar.webex.com/nalsar/j.php?MTID=m4408253ffd561629066a73356a32daca>

Meeting number: 2511 372 1242

**ONLINE LECTURE PROGRAM**  
**Date: 27-09-2022 at 14:00-16:00 Hrs**

# **NALSAR University of Law Hyderabad India.**

## **Lecture Topic: Telecom Industry in India Contemporary Issues and Challenges (Telecommunication Laws in India)**

**Date: 27-09-2022 at 14:00-16:00 Hrs**

**Speaker: K S Mohanavelu**

## Acknowledgements

I take this opportunity to thank Prof. V. Balakista Reddy Registrar NALSAR University of Law Hyderabad for giving me an opportunity to present the lecture “**Contemporary Issues and Challenges** (Telecommunication Laws in India) “ for Post graduate Students of M.A. Space and Telecommunications Law.

I am grateful to Mrs. Bangaru Laxmi Jasti Research Associate, Centre for Aerospace and Defence Laws ([CADL](#)), NALSAR University of Law, Hyderabad, for many valuable suggestions for preparing the presentation on the topic of “**Contemporary Issues and Challenges** (Telecommunication Laws in India) “.

I also want to clarify that short falls in this paper, if any are entirely due to me.

K S MOHANAVELU

# **Contemporary Issues and Challenges**

(Telecommunication Laws in India)

## **Introduction**

**Contemporary Issues and Challenges may arise due to factor such as Customer Protection , Service Requirements, Policy, Regulations, Operations, Technology and Security. The following points are given for studies / analysis from the Contemporary Issues and Challenges points of view.**

**Trends in TV and Telecommunications**

**ARPU and Tariff for Mobile Services**

**Relevance of Satellite Technologies for Telecom**

**Role of Telecom Policy Framework**

**Advantages of Standardization in Telecom Sector**

**PRESENT GOVERNMENT OF INDIA POLICIES**

**ACTION PLAN FOR FUTURE POLICY GUIDELINES**

**Broadband Connectivity Issue**

**Stand Alone Satellite Systems vs. Integrated System**

**Indian National Space Promotion and Authorization Center (IN-SPACe)**

**Basis for Frequency Assignments for Satellite Networks**

# **Contemporary Issues and Challenges (Contd.)**

## **(Telecommunication Laws in India)**

**Contemporary Issues and Challenges may arise due to factor such as Customer Protection , Service Requirements, Policy, Regulations, Operations, Technology and Security. The following points are given for studies / analysis from the Contemporary Issues and Challenges points of view. (Contd.)**

**3G vs. 4G/LTE Technologies**

**Customer Concern for Quality of the Service Provided by the TS**

**Customer Concern Regarding Unsolicited Commercial Communications**

**Regulations for providing Services Using Telecom Infrastructure**

**Telecom Infrastructure is Capital Intensive**

**Restrictions on Telecom Service Providers (TSP)**

**MERGERS AND ACQUISITIONS (M&A) IN THE INDIAN TELECOM SECTOR**

**Telecom Service Security Aspects**

**Way Forwards identified in National Digital Communications Policy 2018**

**Draft Indian Telecommunication Bill, 2022 Documents also address these aspects.**

# **Contemporary Issues and Challenges (Contd.)**

## **(Telecommunication Laws in India)**

### **Introduction**

- **Telecom Industry is a vast field**
- **Indian Telecom Industry serves more than 1 Billion People**
- **Presently mobile phones: 1.2 billion; broadband users: 788 million**
- **Wide range of infrastructure like Wireless Networks, Optic Fibre Networks, Satellite Services, etc.**
- **Many New Emerging Services and Technologies like 5G, LEO Satellite Technology, IOT,**
- **M2M, Cloud, etc.**
- **Infrastructure is capital intensive – Needs Optimum and Efficient Use**
- **Industry faces challenging situations in Spectrum Allocation and Management**
- **Need of the Hour: Free and Open Market Conditions for using Satellite and Mobile**
- **Technologies ensuring Competition and avoiding Monopoly**
- **Policy, Regulations and licensing Regime must be enabling Factors - But Requires Constant Reviews and Reforms**
- **Policy to set immediate, medium term and long term goals and objectives**
- **TSP - Quality of Service to be ensured**
- **Industry to trigger Business and Job Opportunities**
- **Telecom Industry to influence and prepare the country and its citizens for the future**

**Trends in TV and Telecommunications**

**ARPU and Tariff for Mobile**

**Relevance of Satellite Technologies for Telecom**

**Role of Telecom Policy Framework**

**Advantages of Standardization in Telecom Sector**

**Present Government of India Policies For Telecommunication Sector**

**Action Plan For Future Policy Guidelines**

# Trends in TV and Telecommunications

- The mobile phone subscription is around 1.2 billion in the country.
- People in India extensively use mobile phones for wide range of services like voice Communications, Data, Video, Security and various other Media Applications including OTT.
- DTH subscribers decreased from 68.89 million in Q3 to **68.52 million at the end of Q4**. The Cable TV subscription has dropped to **45.5 million** in September 2021 from 46.1 million in June 2021
- While the traditional media verticals like Cable TV and DTH reported a negative growth over the previous year, mobile phone based digital subscriptions (OTT) grew by 49 per cent over the last year as per report dated May 2022.

<https://indianexpress.com/article/cities/ahmedabad/digital-subscriptions-grew-by-49-most-ott-viewers-in-15-34-age-group-7904897/>

## Trends in TV and Telecommunications

- According to a report, as of, 2022, there are about **450 million** OTT subscribers in India.
- This clearly indicates mobile phone is at the centre stage of TV and Telecommunication services.
- Therefore the ongoing and future efforts in TV and Telecom Products, Applications, Solutions and Services need to be more and more Mobile Phone centric.

<https://indianexpress.com/article/cities/ahmedabad/digital-subscriptions-grew-by-49-most-ott-viewers-in-15-34-age-group-7904897/>

# ARPU and Tariff for Mobile Services

- It is reported that Telecom Tariffs in India are lowest in the world. Average revenue per user (ARPU) per month has been languishing. One of the primary reasons for this is the cut-throat competition in the sector.
- Even after a 20% increase in tariffs in November 2021 the cheapest tariff plan for Jio stood at just Rs 75 a month whereas for Airtel and Vodafone it was Rs 99 each.
- This will seriously affect TSPs (Telecom Service Providers) in the long run.

# **ARPU and Tariff for Mobile Services**

## **Fixing Floor Price for Mobile Phone Prices**

### **Issue: No Minimum Tariff**

- Mobile data rates in India are the lowest worldwide
- TRAI is not considering fixing a floor for mobile phone tariffs
- Regulatory officials say that the mobile phone tariff must be under the self control rather than regulator fixing the minimum tariff.
- Government of India / DOT should intervene and address this issue and come out with suitable solutions.
- One possibility is to help TSPs with incentive type support in cash or kind. Suitable criteria may be developed for providing such support.

## Relevance of Satellite Technologies for Telecom

- While the Tariff/ARPU situation for 5G will be known as deployment of 5G networks begins, satellite based systems cannot compete with terrestrial systems on tariff.
- Satellite based systems may be considered for **interim solutions**. In some occasions Satellite can **complement terrestrial systems**.
- In the meantime new technologies like HAP may develop also.
- These aspects need to be studied.

## **Role of Telecom Policy Framework**

- Policy, Regulations, Licensing and Spectrum allocation Procedures are the enabling factors for orderly and efficient operation of Telecom Services.
- The Policy guidelines are to ensure that the advantages of new technologies are accessible to all equitably and affordably.
- The policy sets goals like  
Universal Broadband Connectivity at 50 Mbps speed,  
Fixed Internet Connectivity at Homes and Public places,  
High speed Internet Broadband connectivity for Gram Panchayat / Developmental Institutions / Educational Institutions / Remote Areas
- The overall Objective of the National Policy on digital communications is to prepare the country and its citizens for the future

## Policy Directive For Proactive Actions

In the immediate future there is a need to take actions on the following aspects:

- **Inclusive Growth Criterion:** Improve the penetration of Telecom Services in rural areas/villages.
- **Harnessing New Technologies:** Government is taking proactive actions for starting of 5G services in India.
- **Taking Advantage of Satellite Technologies:** Adopting GSO and Non GSO Satellite based solutions for providing internet and broadband connectivity to villages/remote areas.

## **Advantages of Standardization in Telecom Sector**

**Telecom Equipment vendors play a major role in the Industry.**

**Telecom Standardization work is done at international levels.**

### **International Standardization Organisations - Examples:**

[3GPP](#) – 3rd Generation Partnership Project; [3GPP2](#) – 3rd Generation Partnership Project 2;

[IEEE](#) – Institute of Electrical and Electronics Engineers; [IETF](#) – Internet Engineering Task Force;

[ITU](#) – The International Telecommunication Union; [W3C](#) – World Wide Web Consortium;

[TIA](#) – Telecommunications Industry Association;

[ETSI](#) – European Telecommunications Standards Institute;

[India](#) – BIS – [Bureau of Indian Standards](#);

([https://en.wikipedia.org/wiki/List\\_of\\_technical\\_standard\\_organizations](https://en.wikipedia.org/wiki/List_of_technical_standard_organizations))

**A lot of advances in technology happen for Mobile / Access Services.**

## **Advantage of International Standardization**

- **Technology is taken for granted.**
- **Because of the worldwide standardization efforts, it is easy for the Telecom Industry to absorb the latest technologies as and when it happens.**

## **Need to Enhance National Telecom Industry**

- **However Home grown R&D work needs to be encouraged and enhanced.**
- **Such efforts are required not only in technical areas but also in areas like management, finance, legal, etc.**

# **EXISTING POLICIES FOR TELECOMMUNICATIONS SECTOR**

## **NATIONAL DIGITAL COMMUNICATIONS POLICY- 2018**

NDCP 2018 sets goals, initiatives, strategies and intended policy outcomes.

[https://dot.gov.in/sites/default/files/2018\\_10\\_29%20NDCP%202018\\_0.pdf](https://dot.gov.in/sites/default/files/2018_10_29%20NDCP%202018_0.pdf)

## **National Broadband Mission - December 2019**

National Broadband Mission sets the vision to provide affordable and universal access of Broadband connectivity to all.

[https://dot.gov.in/sites/default/files/National%20Broadband%20Mission%20-%20Booklet\\_0.pdf?download=1](https://dot.gov.in/sites/default/files/National%20Broadband%20Mission%20-%20Booklet_0.pdf?download=1)

# **ACTION PLAN FOR FUTURE POLICY GUIDELINES**

**THERE IS A NEED TO CONTINUOUSLY STUDY AND EVALUATE THE PROGRESS BEING MADE UNDER THE AEGIS OF THE NDCP-2018:**

**NATIONAL DIGITAL COMMUNICATIONS POLICY-**

**THERE IS A NEED TO TAKE INTO ACCOUNT THE ADVANCES IN TECHNOLOGIES AS WELL AS THE EMERGING NEW TELECOM REQUIREMENTS AND DEVELOP ACTION PLANS FOR THE FUTURE POLICY GUIDELINES EXPECTED IN 2024 TIME FRAME.**

# Broadband Connectivity Issue

# **Broadband Connectivity Issue**

**Broadband Connectivity is A Key Factor for overall growth of national Economy.**

**For Example**

**10 % Increase in Internet Subscribers will lead to 3.2 % Increase in GDP.**

**10 % Increase in Mobile Internet Traffic will lead to 1.6 % Increase in GDP**

**Enabling Broadband Connectivity Across the Nation will Bridge the Digital Divide Gaps.**

**India ranks very low at 131 out of 140 nations on Global Index in Speed and Quality**

**Government of India / DOT has taken an important step by launching National Broadband Mission in 2019 with a Vision to provide Affordable Nationwide Broadband Services**

**Concerns**

**Fixed broadband penetration in India is among the lowest in the world at only 1.69 per hundred inhabitants.**

**>50% of rural India is still not digitally connected.**

**>70% of rural India lack Broadband penetration.**

**70% of students lacked access to online education in India during COVID due to poor internet signal..**

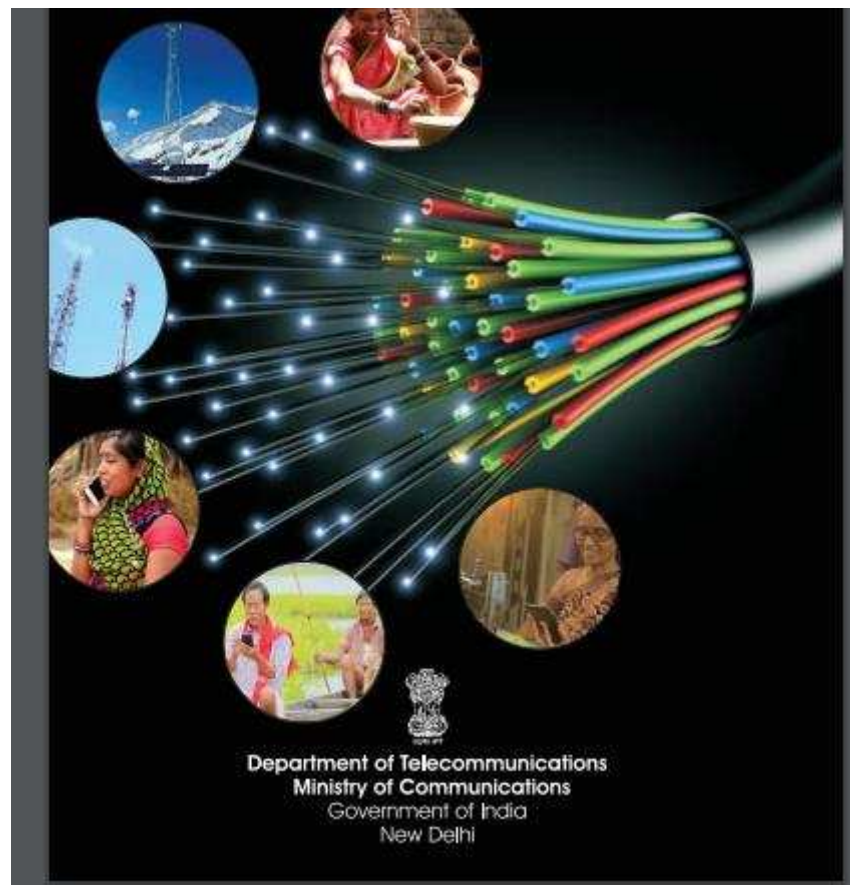
# Fiber Optics Network

- **India's current per capita fiber coverage stands at 0.09 fibre km as compared to 0.87 fibre km for China and 1.3 fiber km for Japan and US.**

**As data consumption continues to increase, deep fiberisation becomes essential for ubiquitous connectivity.**

- **Mobile Backhaul is another issue that the Indian networks need to resolve. India has around 2.3 million mobile base stations but only 30-40% are fiberized.**
- **Also for 5G to succeed, India will need fiber backhaul for tower connectivity of about 80 % in the next 1 - 2 years.**
- **India needs FTTH (to Home) and FTTX (to Anywhere)**
- **India has an optical Fibre Network of around 2.8 million km. However, National Broadband Mission has set a target of 5 million km by 2024.**

# **Government of India recognises Fibre Optics Network Infrastructure is Crucial for Telecommunication Services**



# **Importance of Fibre Optics Network Infrastructure**

- **Core Network, International / Overseas Communications, Mobile Back Haul, Internet Connectivity for Customers / Corporates, Lease Circuits and many others**
- **Applications are many. E-learning, E-health, E-governance, Access to information & broadband services, Communications during Natural disasters and Emergency situations**
- **Government of India recognises Fibre Optics Network Infrastructure is Crucial for Telecommunication Services**
- **National Fibre Authority (NFA) is planned to expand and speed up fibre deployments.**

## **Innovative Action Plan**

- **As per surveys, it is found that fibre optics and other means are not possible for providing broadband connectivity for about 40000 villages and hence satellite based networks can only be used for broadband connectivity for these villages.**
- **Beyond these locations also, satellite technologies can play an useful role in accelerating the rollout of an even larger number of locations against multi-year fiber rollout schedules.**
- **Taking Advantage of Technologies**  
**There is a need to accelerate the actions for enabling Nationwide Broadband Connectivity taking advantage of Fiber Optics, Satellite and Other Advanced Technologies.**

# Number of Internet Subscribers TRAI Data – March 2022 Subscribers per 100 Population

**Rural: 37.06                      Urban: 102.82 %                      Overall: 60 %**

**ISSUE: Rural Areas lag in Broadband Services**

| Internet/Broadband Subscribers                |                |
|-----------------------------------------------|----------------|
| Total Internet Subscribers                    | 824.89 Million |
| % change over previous quarter                | -0.53%         |
| Narrowband subscribers                        | 36.59 Million  |
| Broadband subscribers                         | 788.30 Million |
| Wired Internet Subscribers                    | 27.27 Million  |
| Wireless Internet Subscribers                 | 797.61 Million |
| Urban Internet Subscribers                    | 493.08 Million |
| Rural Internet Subscribers                    | 331.81 Million |
| Total Internet Subscribers per 100 population | 60             |
| Urban Internet Subscribers per 100 population | 102.82         |
| Rural Internet Subscribers per 100 population | 37.06          |

**DOT initiative for Fibre Penetration and  
LEO Satellite Constellation Technology Based Solution  
For Broadband Service in Rural Areas**

# **Stand Alone Satellite Systems vs. Integrated System**

## Internet Connectivity Services

Optical Fibre based internet connectivity services are highly competitive in India.

India's Fastest Broadband Internet service providers 2021 are:

Airtel; Reliance Jio Fiber; Excitel Broadband; BSNL; Hathway's Broadband; ACT Fibernet Broadband; You Broadband

(<https://freekaamaal.com/miscellaneous/best-internet-service-provider-in-india>)

Satellite based internet services are expensive

### GSO and NON GSO Satellite Based Internet Access Services

| Provider                                                                          | Best For                          | Price                      | Download speed | Details   |
|-----------------------------------------------------------------------------------|-----------------------------------|----------------------------|----------------|-----------|
|  | Fastest satellite internet speeds | \$30.00–<br>\$150.00/mo.*  | 12–100 Mbps    | 12–300 GB |
|  | Budget-friendly low-end plans     | \$59.99–<br>\$149.99/mo.** | 25 Mbps        | 10–50 GB  |

Non GSO Satellite Based Internet Access Services may bring down the price and the availability:

SpaceX / Starlink satellite internet price

| Plan                                                                                | Price    | Downlink Speed | Data Cap  |
|-------------------------------------------------------------------------------------|----------|----------------|-----------|
|  | \$99/mo. | 50–150 Mbps    | Unlimited |

Other Non GSO Systems like m03b, OneWeb, etc are likely to offer similar highly competitive satellite based internet service services and prices.

## Key role of LEO Satellite operators

### LEO Satellite Constellation Operators Getting Ready to provide Broadband Connectivity

#### Countdown Begins

**SpaceX, Bharti Global's OneWeb and Amazon's Project Kuiper** are eyeing India's **satellite broadband space**

**SpaceX** has been accepting pre-orders for beta version of its service in India for a fully refundable deposit of **\$99**

**Co's satellite broadband services** are being targeted in **India** in 2022 subject to regulatory approvals



# Major Advances in Satellite Technologies

Innovative use of new technologies reduces Cost per Mbps



|                                                                                                      |                                                                                                     |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>Reduce Infrastructure Costs:</b>                                                                  | <b>Increased Payload Flexibility:</b>                                                               |
| More efficient payloads<br>Advanced Electric Propulsion<br>Lower dry mass – Lattice like structure   | Advanced Digital Beam Forming Processors<br>Advanced Phase Array<br>KA MPA – Lower Cost of Capacity |
| <b>Launch Vehicles – Higher Performance/Cost:</b>                                                    | <b>Resilient end to end ground network:</b>                                                         |
| Reduce launch mass<br>Use lower class vehicles to inject<br>Larger Payloads                          | Higher Performance<br>Greater Capacity<br>Secure Network                                            |
| <b>High Throughput Satellite (HTS)</b><br>50 – 200 Gbps to 1 Tbps                                    | <b>Innovation in All Satellite Bands</b>                                                            |
| NGSO Satellite Constellations                                                                        | Open Architecture - IP and 5G Standards                                                             |
| Higher Speeds 50/5 Mbps                                                                              | Highly Cost Effective –<br>Terrestrial comparability                                                |
| Enhanced Utility for Rural/Remote                                                                    | Land/Sea/Air Connectivity                                                                           |
| <b>Innovative use of new technologies reduces Cost per Mbps</b>                                      |                                                                                                     |
| Reference: Presentation by Dr Bashir Patel to SLA Working Group on Satellite – 5G Integrated Systems |                                                                                                     |

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# Mobile Network and Communication Satellites

## Two Independent Paths

- All along Satellite Systems have been generally Designed, Built. Launched and operated as 'Stand Alone' Systems for applications like DTH, VSAT, TV Distribution and Satellite News Gathering Services (SNG).
- These Satellite Systems are operated as individual Networks. As these networks were based on proprietary specifications these individual satellite networks could not be operated as integrated or connected systems.
- Whereas in the case of terrestrial mobile communication systems, right from nineties international forum like 3GPP focussed on developing international inter operability for mobile phones (IMT standards) and as a result worldwide mobile network expansion is phenomenal.
- Now there are **5.34 billion** unique mobile phone users in the world today, according to the latest data from GSMA Intelligence.

# Paradigm Shifts in Communication Satellite Technologies

## 3GPP Decision on Integration of Satellite Networks with 5G Mobile Networks

- For very long time the international forum 3GPP did not consider satellite systems as a part of mobile communication architecture and hence satellite industry could not take advantage of such large scale advances and growth of mobile communications networks since nineties.
- But in the recent years, there has been an increasing interest from the satellite communication industry in participating in the 3GPP standardization effort for 5G.
- Recognising the advantages of integrated satellite-terrestrial network, 3GPP Forum initiated in March 2017, as part of Release 14, a study item to analyse the feasibility of satellite integration into 5G network.
- Such an integrated approach is being pursued by 3GPP and the Industries.

# **Paradigm Shifts in Communication Satellite Technologies**

## **Integration of Future Satellite Networks with 5G**

### **Satellite Networks to Emerge as Integrated Systems in the future**

- 3GPP forum is now in the process of defining in detail the interfaces between 5G Mobile networks and satellite based networks facilitating the development of integrated systems. The 3GPP 5G Base Station Standards compliant interfaces are being developed for Satellite Gateway Station as well as Satellite On-board Regeneration Payload to facilitate integration with terrestrial 5G Networks in a phased manner.
- This will enable satellite networks to function as the integrated systems availing the advantages of 5G Service features.

# Example Action for Integration of MEO Satellite Network with 5G

International Satellite Operator SES is playing leading role in satellite integration of its MEO Satellite Constellation **O3b mPower** with Terrestrial 5G Networks

## SES is playing leading role in satellite integration into 5G

Leadership role in critical industry standards and technology initiatives



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|                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                |                                                                                                                                                                             |                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <p>▲ Active contributor to relevant standards for promoting satellite integration into 5G</p>                                                  |       | <p>▲ Co-founder and Vice-Chair of the 5G Infrastructure Association</p> <p>▲ Providing policy, regulatory, standards, spectrum and technology narrative</p> |
|                                                                                                                                                                                                                                                        | <p>▲ Only CE 2.0 certified services (sub 150 ms latency) in industry</p> <p>▲ Designing orchestration solutions aligned to MEF 55 LSO spec</p> |       | <p>▲ Member of ESA "Satellite for 5G" Task Force</p>                                                                                                        |
|                                                                                                                                                                    | <p>▲ Founding member of Linux Foundation Networking Fund</p> <p>▲ Designing network automation solutions aligned to ONAP</p>                   |                                                                                         | <p>▲ Active participation in publicly-funded collaborative innovation projects for ecosystem and technology development</p>                                 |
|  <p>TELECOM INFRA PROJECT</p>                                                                                                                                                                                                                        | <p>▲ Contributing to critical initiatives to lower cost of reaching underserved populations</p>                                                |   | <p>▲ Developing and demonstrating the technologies and capabilities needed for satellite integration into 5G</p>                                            |

SES Proprietary and Confidential | 16th BroadSky Workshop, 16 October 2018

# **Formation of Indian National Space Promotion and Authorization Center (IN-SPACe)**

## **Basis for Frequency Assignments for Satellite Networks**

# **Space Infrastructure / Satellite Based Telecommunications**

## **Indian National Space Promotion and Authorization Center (IN-SPACe)**

Recently Government of India has established IN-SPACe.

IN-SPACe is an independent nodal agency under Department of Space for allowing space activities and usage of DOS owned facilities by NGPEs as well as to prioritise the launch manifest.

The Policies and Guidelines formulated and adopted by IN-SPACe will be applicable for establishing and operating space infrastructures for providing Satellite Based Telecommunication Services in the Country.

<https://www.isro.gov.in/indian-national-space-promotion-and-authorization-center-space>

# **Space Infrastructure / Satellite Based Telecommunications**

## **Indian National Space Promotion and Authorization Center (IN-SPACe)**

IN-SPACe has already started taking actions on the usage of DOS owned facilities by NGPEs and the Launch Manifest.

IN-SPAC is expected to make formal announcements on SATCOM Policy and other space matters.

<https://www.isro.gov.in/indian-national-space-promotion-and-authorization-center-space>

# **Basis for Frequency Assignments for Satellite Networks**

## **Industry bats for administrative allocation of Satcom spectrum**

### **Issue: Auction for Satellite Spectrum ?**

- **Industry body Broadband India Forum (BIF) has made a pitch for administrative allocation of Satellite Spectrum in tune with global norms**
- **Terrestrial Concept of exclusivity does not apply to Satellite Spectrum**
- **Satellite Operators Coordinate Spectrum internationally and share for Multiple Satellites and Uses**
- **Satellite Spectrum is subject to international obligations as per ITU Radio Regulations**
- **Forum argues for Liberal Licensing Policy and Regulatory Framework for Satellite Services**
- **Free and Open Market Eco System for the use of satellite Technologies**

# **Frequency Assignments for Satellite Networks**

## **Industry bats for administrative allocation of Satcom Spectrum**

### **No Auction for Satellite Spectrum**

- **World over Satellite Spectrum is authorized for ‘right-to-use’ principle**
- **Satellite Spectrum Allocation only by administrative process just to cover the cost of administration**
- **Satellite bandwidth is from internationally coordinated satellites over Indian Skies**
- **BIF says such Satellite bandwidths must be also put into use through the process of direct negotiations**
- **Proposes utilizing the available foreign satellite capacity and promoting local equipment and components in gateways**

# **Frequency Assignments for Satellite Networks**

## **Industry bats for administrative allocation of Satcom Spectrum**

### **No Auction for Satellite Spectrum**

#### **Need of the Hour:**

#### **Free and Open Market Conditions for using Satellite and Mobile Technologies**

- **Liberal Regulatory Framework for Satellite Services will trigger flow of foreign investments.**
- **BIF also proposes also lowering the levies in the Telecom Sector**
- **Such measures will drive Satellite Operators providing rural broadband coverage and services**
- **Public Data Offices use satellite powered VSATs and mobile networks for many societal applications**
- **These applications demand high volumes of capacity at affordable prices**
- **This calls for Changes to current regulations**

## **28 GHz Band Allocation for Space or Terrestrial Services**

### **Issue: 28 GHz Spectrum Allocation**

#### **5G vs Satellites**

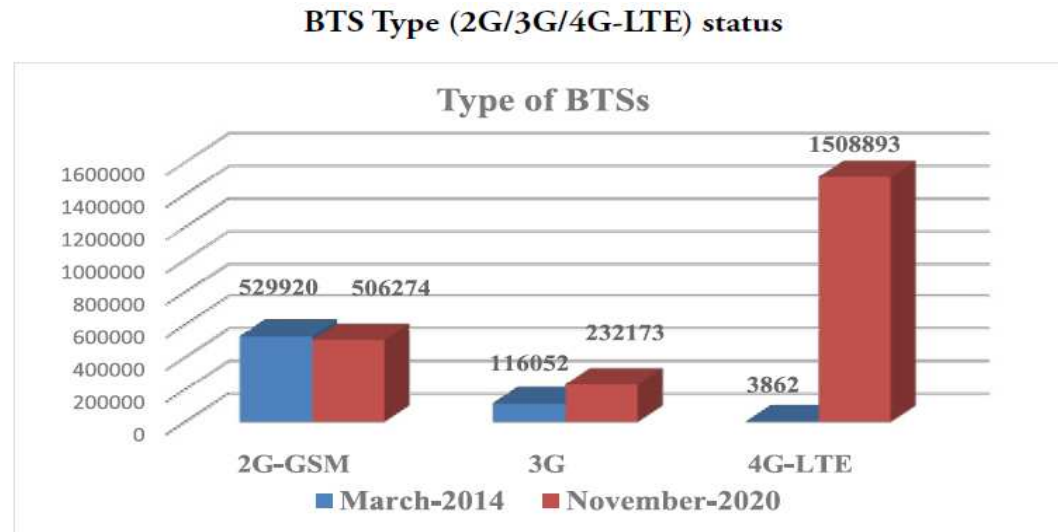
- **Satellite Companies oppose auctioning satellite spectrum 28 GHz band (27.5-29.5 GHz) for 5G mobile services**
- **The frequency band 27.5-29.5 GHz is considered highly efficient band for 5G Mobile Services**
- **Telcos argue that 5G deployment costs would surge in the absence of 28 GHz band**
- **Telcos have been allocated spectrum in the 700 MHz, 3.3-3.6 GHz, and 24.25-28.5 GHz bands for 5G trials in India in various locations**
- **Satellite Companies and Telcos may need to discuss frequency sharing and other possibilities to find solutions**

# 3G vs. 4G/LTE Technologies

# Some of the Issues affecting Telecom Industry Players

## ISSUE: 3G Spectrum Costs

<https://dot.gov.in/sites/default/files/Annual%20Report%202020-21%20English%20Version.pdf>



(Source TARANG Sanchar Portal & CoAI)

### Comparison 3G and 4G-LTE Technologies

This Figure shows that 4G-LTE system is more successful and versatile as compared to 3G.

TSPs (like AirTel, Vodafone) who operate 3G and also went through the highly competitive auction process for 3G Services way back in 2010 are affected.

# AirTel and Vodafone operate 3G Mobile Networks in India

<https://www.nepalitelecom.com/2017/02/frequency-bands-2g-3g-4g-mobile-india.html>

| S.N                                                                                                                | Mobile Technology in India | Frequency bands in India | Major Operators                                             |
|--------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------|-------------------------------------------------------------|
| 1                                                                                                                  | GSM (2G)                   | 900 MHz, 1800 MHz        | <del>Airtel</del> , Idea Vodafone, <del>Aircel</del> , BSNL |
| 2                                                                                                                  | CDMA                       | 850 MHz                  | Reliance, BSNL, Tata                                        |
| 3                                                                                                                  | WCDMA (3G)                 | 2100 MHz, 900 MHz        | <del>Airtel</del> , Idea Vodafone                           |
| 4                                                                                                                  | <del>WiMAX</del>           | 2300 MHz                 | BSNL                                                        |
| 5                                                                                                                  | 4G LTE (4G)                | 1800MHz                  | <del>Airtel</del> , Idea Vodafone, <del>Jio</del>           |
|                                                                                                                    |                            | 850 MHz                  | <del>Jio</del>                                              |
|                                                                                                                    |                            | 2300 MHz                 | <del>Airtel</del> , Idea Vodafone, <del>Jio</del>           |
|                                                                                                                    |                            | 2500 MHz                 | BSNL, Idea Vodafone                                         |
| 5G: 700 MHz, 3.3-3.6 GHz, and 24.25-28.5 GHz; 4G spectrum for trials in the 900 MHz, 1800 MHz, and 2300 MHz bands. |                            |                          |                                                             |

**Customer Concern for  
Quality of the Service Provided by the TSP**

**Customer Concern Regarding  
Unsolicited Commercial Communications**

**Regulations for providing Services Using Telecom  
Infrastructure**

## **Issue: Customer Concern for Quality of the Service Provided by the TSP**

### **Mobile Number Portability Regulations**

MNP allows mobile subscribers to retain their existing telephone numbers when they switch from one telecom operator to another irrespective of mobile technology.

TRAI introduced the Telecommunications Mobile Number Portability Regulations, 2009 .

As per the regulations, the subscribers would be allowed to retain their mobile number while moving from one TSP to another.

This in turn is likely to compel the telecom service providers to maintain/improve the quality of their service to avoid losing subscribers.

This can be seen as mature element of the Indian telecom industry and a natural step for the industry to go forward as it helps customers.

## **Issue: Customer Concern Regarding Unsolicited Commercial Communications**

### **SMS Regulations to help Customers to Choose Commercials**

The SMS Regulations have mandated the creation of a National Customer Preference Register, a national database with a list of the telephone numbers of all subscribers who have registered their preferences regarding receipt of commercial communications.

Subscribers have been given the option of indicating their preference by registering either under the fully blocked category or the partially blocked category.

In the fully blocked category, a subscriber opts not to receive any type of commercial communication, while the partially blocked category enables subscribers to receive commercial communications only in the categories they have chosen.

Subscribers under the partially blocked scheme may choose from a selection of categories including: banking, insurance, financial products and credit cards; real estate; education; health; consumer goods and automobiles; communication, broadcasting and entertainment; IT; and tourism.

## **Issue: Regulations for providing Services Using Telecom Infrastructure**

### **Other Service Provider (OSP) Registration with DOT**

Other Service Providers (OSPs) do not require a specific license; however a registration process is required to be fulfilled subject to fulfilling certain criteria. The most important of which is the Other Service Providers registration.

Call centres (international and domestic), BPOs, Network Operation Centers, Vehicle Tracking Systems, services with respect to tele-banking, tele-medicine, tele-education are allowed to operate (with 100% FDI) upon registration as “Other Service Provider” or “OSP” with the DoT.

These OSPs operate the service using the telecom infrastructure provided by licensed telecom service providers.

**These aspects will be addressed in the New Telecom Bill 2022.**

**Telecom Infrastructure is Capital Intensive**

**Preference to Indian Telecom Equipment Manufacturers**

**Restrictions on Telecom Service Providers (TSP)**

**MERGERS AND ACQUISITIONS (M&A)**

**IN THE INDIAN TELECOM SECTOR**

**Telecom Service Security Aspects**

**Way Forwards identified in National Digital Communications  
Policy (NDCP)2018**

**Draft Indian Telecommunication Bill, 2022**

## **Issue: Telecom Infrastructure is Capital Intensive**

### **Telecom License Permits Sharing of Telecom Infrastructure**

The telecom sector is a very capital intensive sector and requires large investments.

The telecom licenses permit the telecom operators to share passive infrastructure such as building, tower, dark fibre, etc.

Sharing of active infrastructure amongst licensees shall be governed by the license conditions/amendments issued by the DoT.

As a result of this policy, new entrants who are allotted spectrum by the WPC can easily launch their telecom services within a short period by taking the assistance of the existing active infrastructure of other telecom service providers and thereby will not have to incur huge infrastructural costs

## **Issue: Preference to Indian Telecom Equipment Manufacturers**

### **Government Departments Grant Preferential Market Access to Indian Telecom Equipment Manufacturers**

Government issued a notification granting preferential market access to domestic telecom manufacturers.

The notification, mandates that domestically manufactured telecom products must be given preference, when the same is being procured by Government departments and agencies .

The main objective is to give impetus to Indian Telecom Equipment Manufacturers.

## **Issue: Restrictions on Telecom Service Providers (TSP)**

### **Balanced and Transparent License Provisions**

The licenses themselves have a number of provisions which can be seen as quite restrictive.

These are mostly security driven restrictions and have not led to any dampening of foreign interest in this sector. Some of these restrictions are discussed as follows:

- i. Telecom licenses are only granted to companies which are registered in India;
- ii. The majority of directors of the board of the company have to be Indian citizens;
- iii. Certain positions which are instrumental to the operations of the company such as Chief Officer in charge of technical network operations, Chief Security Officer and Officials dealing with lawful interception of messages have to be occupied by resident Indian citizens;
- iv. Certain key positions (such as chairman, managing director, chief executive officer and/ or chief financial officer), if held by foreign nationals are required to be security vetted by the Ministry of Home Affairs.

# **MERGERS AND ACQUISITIONS (M&A) IN THE INDIAN TELECOM SECTOR**

## **DoT Guidelines on M&A**

With the liberalization of the Indian economy, the telecom sector has become very attractive for mergers and acquisitions.

Some of the big deals that have taken place in the Indian telecom include the following:

- SingTel increasing its stake in Bharti telecom from 30.8 % to 32.34 % in 2013;
- Reliance Industries Limited acquiring 95% of the equity shares of Infotel Broadband Services to gain access to the BWA spectrum won by Infotel Broadband Services.
- Aditya Birla Telecom acquiring Spice Telecom
- Providence's investment into Aditya Birla Telecom in 2009
- Vodafone taking over Hutchison-Essar in 2007
- Malaysia Telekom's 49% stake in Spice Telecom
- Temasek Holdings' 9.9% stake in Tata

## **DoT Guidelines on M&A**

**A. *Prior Approval of the DoT***

**B. *Validity of the License***

**C. *Lock In on Sale of Shares***

**D. *Easing of Rules to Avoid Monopoly in the Market***

**E. *Acquirer to Pay Difference Between the Market Price of Spectrum and the Entry Fee Paid by the Target***

## **Issue: Telecom Service Security Aspects**

### **Security Related Requirements**

Details of infrastructure/network diagram could be provided on a need basis only to telecom equipment suppliers/manufacturers and affiliate / parent of licensee company.

Clearance of DoT would be required if such information is to be provided to anybody else.

Licensee company should ensure that the information transacted through their network is secure and protected.

Incorporation of Provisions in the Telecom Network for Monitoring of identified Calls Originated and Terminated in India

## Way Forwards identified in National Digital Communications Policy (NDCP)2018

- Promoting Next Generation Technologies
- Enabling Hi-speed internet, Internet of Things and M2M by rollout of 5G technologies:
- Establishing India as a global hub for cloud computing, content hosting and delivery, and data communication systems and services
- Leveraging Artificial Intelligence and Big Data in a synchronized and effective manner to enhance the overall quality of service, spectrum management, network security and reliability
- Strengthening Satellite Communication Technologies in India - Review the **regulatory regime for satellite communication** technologies - **Optimise Satellite communications** technologies in India - Developing **ecosystem for satellite communications** in India

## **Way Forwards identified in National Digital Communications Policy (NDCP)2018**

- Widening the scope of Telecom Infrastructure Providers, Attracting Investments and Capacity Building, Ensuring a holistic and harmonised approach for harnessing Emerging Technologies
- Channelizing the Universal Service Obligation Fund (USOF) for various deserving Developmental Activities
- Ensuring Standards and Quality Assurances for Telecom Services
- Facilitating the establishment of a Pan-India network for Public Protection and Disaster Relief (PPDR)
- Research and Development and Local Manufacturing and Value Additions
- Creating Job Opportunities and Training Personnel in the Digital Communications Sector

# **Draft Indian Telecommunication Bill, 2022**

**The Proposed New Telecom Bill provides a Road Map for Restructuring Telecom Sector; Promotes Innovation.**

**21st September 2022**

## **Now there is a Draft Indian Telecommunication Bill, 2022**

Ministry of Communications had initiated a public consultative process to develop a modern and future-ready legal framework in telecommunication. We need to wait for the Deliberations and Decisions/Approvals.

<https://dot.gov.in/sites/default/files/Draft%20Indian%20Telecommunication%20Bill%20C%202022.pdf>

## **Inviting comments on the draft Indian Telecommunication Bill, 2022**

<https://dot.gov.in/sites/default/files/Inviting%20Comments%20on%20the%20draft%20Indian%20Telecommunication%20Bill%20C%202022.pdf>

## **Explanatory note to the draft Indian Telecommunication Bill, 2022**

<https://dot.gov.in/sites/default/files/Explanatory%20Note%20to%20the%20draft%20Indian%20Telecommunication%20Bill%20C%202022.pdf>

***Thank You***