



## Allocation of Satellite Spectrum

**For Prelims:** [Spectrum Allocation](#), [Administrative Allocation vs. Auction](#), [International Telecommunication Union \(ITU\)](#), [Telecommunications Act, 2023](#)

**For Mains:** Spectrum Management in India, Economic Implications of Spectrum Allocation, Regulatory Framework, Spectrum allocation practices in different countries.

[Source: BS](#)

### Why in News?

Recently, India opted for an **administrative allocation of satellite spectrum**, diverging from the **auction method**, amid reactions from industry giants and renewed debates over spectrum management.

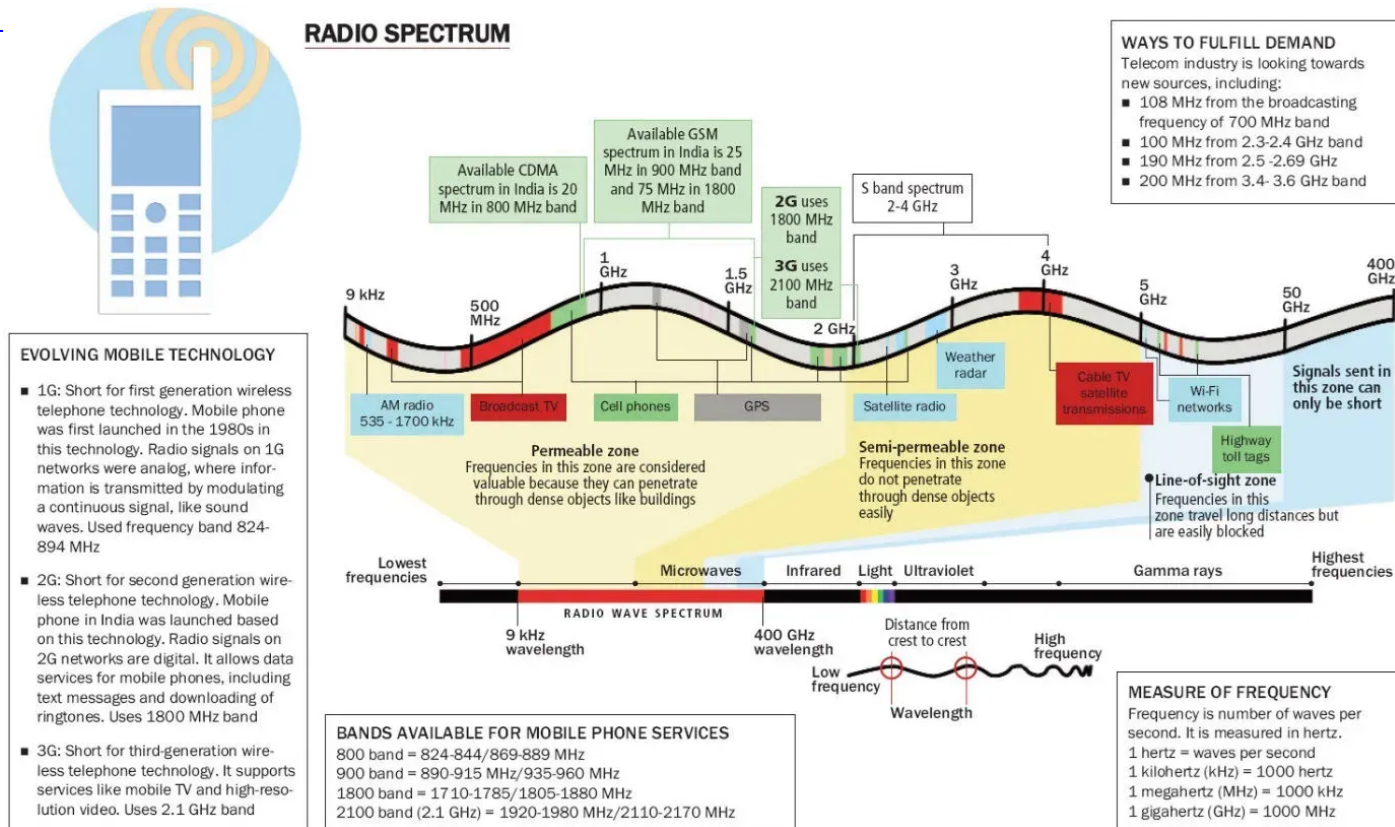
### What is Satellite Spectrum?

- **Definition:**
  - Satellite spectrum refers to the specific **frequency bands** used for **communication via satellites**.
    - These radio frequencies are essential for transmitting signals from ground stations to satellites in orbit and vice versa, facilitating services such as **television broadcasting, internet access, and mobile communication**.
- **Regulatory Oversight:**
  - Satellite spectrum differs from terrestrial spectrum used for mobile communication, as it operates without national boundaries.
    - This international nature requires coordination and management by the **International Telecommunication Union (ITU)**, a **UN** agency.
- **Importance in Communication:**
  - With the increasing demand for satellite services especially in areas like broadband and emergency communications, spectrum allocation becomes crucial.
    - Efficient management of satellite spectrum ensures reliable connectivity, especially in remote or underserved regions.
- **Satellite Frequency Bands:**
  - **L-band (1-2 GHz):** Utilised for **GPS** and **mobile satellite services**.
  - **S-band (2-4 GHz):** Used for weather **radar**, air traffic control, and mobile satellite applications.
  - **C-band (4-8 GHz):** Commonly employed for satellite TV broadcasting and data communication.
  - **X-band (8-12 GHz):** Primarily utilised by military applications for radar and communication.
  - **Ku-band (12-18 GHz) and Ka-band (26-40 GHz):** Used for satellite television, internet services, and high-throughput data transmission.

## International Telecommunication Union (ITU)

- It is the **UN specialised** agency for Information and Communication Technologies (ICTs).
- Established in 1865 to **enable international connectivity in communication networks**, it is headquartered in Geneva, Switzerland.
- It allocates global radio spectrum and satellite orbits, develops the technical standards that ensure networks and technologies seamlessly interconnect, and strives to improve access to ICTs to underserved communities worldwide.

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## Status of the Satellite Communication (SatCom) Sector in India

- Market Size:**
  - India is ranked **fourth globally** in terms of investments in the Satcom sector.
  - The Indian Satcom sector is valued at approximately **USD 2.3 billion** annually which is expected to grow to **USD 20 billion** by 2028.
  - Around **290.4 million households** in India remain untapped for broadband services, presenting a significant opportunity for satellite operators.
    - India's focus on development and adoption of cutting-edge technologies across **5G/6G** services and **Satellite Communication (Satcom)** has further accelerated the sector's progress.
- Applications:**
  - Satcom services support vital sectors, including telecommunications, broadcasting, rail, and maritime communications.
  - Satcom services support 5 billion ATM transactions annually, through 125,000 **Very Small Aperture Terminal (VSAT)**-enabled ATMs.

## What Are the Methods of Spectrum Allocation In India?

- Auction Method:** Competitive bidding process where the government sells spectrum licenses to

the highest bidder.

- Governed by the [Telecommunications Act, 2023](#), which mandates auctions for most spectrum allocations.
- **Benefits:**
  - Promotes efficient resource allocation, ensures transparency, and generates significant revenue for the government.
  - Primarily used for terrestrial mobile services where multiple entities compete for access.

▪ **Administrative Allocation:** The government directly assigns spectrum licenses without a bidding process.

- Certain entries in the **First Schedule of the Telecommunications Act, 2023** allow for administrative allocation, particularly for satellite spectrum.
- **Benefits:**
  - Provides flexibility, suitable for sectors with low competition, and ensures easier access for government-related services.
  - Often used for emerging industries, public services, and [national security](#).

▪ **Differences Between Auction and Administrative Allocation:**

Auction Method	Administrative Allocation
<ul style="list-style-type: none"> <li>▪ Mandated by the Telecommunications Act, 2023.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Governed by provisions in the Telecommunications Act, 2023 for specific sectors.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Competitive bidding; licences sold to highest bidder.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Direct assignment by the government without bidding.</li> </ul>
<ul style="list-style-type: none"> <li>▪ High transparency; reduces chances of favouritism</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lower transparency; potential for less oversight.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Generates significant revenue for the government.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Typically involves nominal fees covering administrative costs.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Allocates spectrum to those who value it most; efficient in competitive markets.</li> </ul>	<ul style="list-style-type: none"> <li>▪ More flexible but less efficient in resource allocation.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Commonly used for commercial telecommunications.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Suitable for national security, public services, and specialised sectors.</li> </ul>

## Spectrum Allocation Controversies in India

- **Shift to Administrative Assignments:** India's spectrum allocation has faced scrutiny, particularly with the transition to administrative methods.
- **2G Spectrum Scam:** This major scandal involved the first-come, first-served allocation of 2G licenses, resulting in:
  - **Financial Losses:** Alleged loss to the exchequer of Rs. 30,984 crore.
  - **Presumptive Loss:** Estimated loss of Rs. 1.76 trillion from 122 2G licenses.
    - [Supreme Court](#) Ruling (2012) mandated auctions as the preferred allocation method due to the 2G scandal's fallout.

## Why did India Choose for Administrative Allocation?

- **Non-Exclusive Use:** Unlike [terrestrial spectrum](#), satellite spectrum can be shared among multiple operators, making administrative allocation practical for diverse users.
- **Accessibility to Remote Areas:** Administrative allocation aims to enhance connectivity in remote and underserved regions, facilitating access to satellite services.
- **Flexibility:** This method allows the government to quickly assign spectrum to companies without the lengthy auction process, promoting faster deployment of services.
  - The US and Brazil moved back to **administrative allocations** after finding auctions impractical.
- **Encouraging Emerging Industries:** It supports the growth of new technologies and services, such as **satellite communications**, which may not be adequately addressed by auctions.
- **Regulatory Alignment:** As a signatory to the **ITU**, India chose to adopt the global standard of administratively allocating satellite spectrum.
  - The **Telecommunications Act, 2023**, had also added spectrum for satellite communication in the list of administrative allocation.

## Salient Features of the Telecommunications Act, 2023

- **Definitions:** The Act clearly defines its scope, thereby reducing uncertainties.
  - Messages sent through internet-based messaging service providers such as WhatsApp, Signal, and Telegram, as well as those that are encrypted (except Over-the-Top (OTT) services), are within the Act's ambit.
- **Right of Way (RoW) Framework:** The Act provides an effective RoW framework, both on public and private property.
  - The definition of public entities has been broadened to include government agencies, local bodies, and [Public Private Partnerships \(PPP\)](#) projects like airports, seaports, and highways.
  - Public entities shall be obligated to provide right of way except in special circumstances.
- **Common Ducts:** In line with [PM Gati Shakti's vision](#), the law provides for the Central Government to establish common ducts and cable corridors.
- **National Security Measures:** Section 20 (2) of the Act allows the government to stop the transmission of any message in the interest of public safety and during a public emergency.
  - This majorly expands the number of government entities that may be able to intercept messages.
- **Digital Bharat Nidhi:** With the new Act, the [Universal Service Obligation Fund \(USOF\)](#) will become Digital Bharat Nidhi, which can be used to fund research and development and pilot projects instead of just supporting the establishment of telecom services in rural areas.
  - The Act also provides a legal framework for [Regulatory Sandbox](#) to facilitate innovation and deployment of new technology.
- **Protection of Users:** Commercial messages sent without the user's consent may lead to the relevant operator facing a fine and being banned from providing services.

## Conclusion

India's decision to adopt administrative allocation for satellite spectrum aligns with global practices, enhancing efficiency and accessibility in the rapidly evolving satcom sector. With the satcom market expected to grow significantly, administrative allocation aims to facilitate connectivity in underserved regions, promoting digital inclusion. The move reflects lessons learned from past spectrum allocation controversies, particularly the 2G scam, emphasising transparency and accountability in regulatory frameworks.

### **Drishti Mains Question**

Discuss the implications of India's shift to administrative allocation of satellite spectrum in light of past controversies and future market potential.

