



5G Trial

Why in News

The **Department of Telecommunications (DoT)** has given **permissions to Telecom Service Providers (TSPs)** for conducting trials **for use and applications of [5G technology](#)**.

- This formally **leaves out Chinese companies** like Huawei and ZTE from the 5G race in India.

Key Points

▪ About the Trials:

- In the initial phase, these trials **will be for 6 months**, including a 2 month period for procurement and setting up of the equipment.
- TSPs will be required to **test their set up in urban areas, semi-urban areas as well as rural areas**.
- TSPs will be **provided with experimental spectrum** in various bands, such as the mid-band of 3.2 GHz to 3.67 GHz, the millimeter wave band of 24.25 GHz to 28.5 GHz, and others.
- **Applications** such as tele-medicine, tele-education, augmented/ virtual reality, drone-based agricultural monitoring, etc. will be tested. The **data generated during the trials will be stored in India**.
- **Use of Indigenous Technology:** The TSPs are encouraged to conduct trials using **5Gi technology** in addition to the already known 5G Technology.
 - The **5Gi technology** was advocated by India and it is approved by **[International Telecommunications Union \(ITU\)](#)** - the United Nations specialized agency for information and communication technologies - ICTs.
 - The 5Gi technology **has been developed by** IIT Madras, Centre of Excellence in Wireless Technology (CEWiT) and IIT Hyderabad.
 - It **facilitates much larger reach of the 5G towers and Radio networks**.

▪ Need for 5G Trial:

- The **telecom market in India is left with only three private telcos**, with the rest having surrendered to the **low returns on investments** over the years. The **two state-run companies, MTNL and Bharat Sanchar Nigam Limited (BSNL)** have survived but are making losses.
- In order **to increase their average revenue per user**, it is pertinent for telcos to start offering the new 5G technology as soon as possible.

▪ Chinese Telecom Companies in India:

- India's telecom ministry **has left out Chinese equipment makers Huawei and ZTE from its 5G trials**, becoming **the latest country to lock the firms out**.
 - The US says **Huawei could be used by China for spying**, via its 5G equipment and its Federal Communications Commission (FCC) has even ordered certain US telecommunications companies to remove Huawei equipment from their network.

- **India is yet to implement any type of official ban on the Chinese companies**, which currently supply a significant amount of equipment to India's mobile providers.
- However, the **government has signalled a tighter, more security-oriented approach to the country's networks**, which is widely **expected to work against the Chinese companies**.
 - In December 2020, the government said **it would identify "trusted" sources of telecoms gear its carriers can use** in their networks as part of the [new security directive](#) for the sector.
 - Those new procurement rules are expected to come into effect in June 2021, and will restrict Indian network providers to buying certain types of equipment from "trusted sources". It **might also include a list of banned suppliers**.

5G Technology

▪ Features of 5G Technology:

- **Bands in 5G:** 5G mainly work in 3 bands, namely low, mid and high frequency spectrum — all of which have their own uses as well as limitations.
 - **Low band spectrum:** It has shown great promise in terms of coverage and speed of internet and data exchange however the maximum speed is limited to 100 Mbps (Megabits per second).
 - **Mid-band spectrum:** It offers higher speeds compared to the low band, but has limitations in terms of coverage area and penetration of signals.
 - **High-band spectrum:** It has the highest speed of all the three bands, but has extremely limited coverage and signal penetration strength.
- **Upgraded LTE:** 5G is the **latest upgrade in the [long-term evolution \(LTE\) mobile broadband networks](#)**.
- **Internet Speed and Efficiency:** In the high-band spectrum of 5G, internet speeds have been tested to be as high as 20 Gbps (gigabits per second) as compared to the maximum internet data speed in 4G recorded at 1 Gbps.
 - 5G will provide up to three times greater spectrum efficiency and ultra low latency.
 - Latency is the amount of time data takes to travel between its source and destination.

▪ Utility of 5G Applications:

- **Trigger Fourth Industrial Revolution:** Combined with [IoT](#), cloud, [big data](#), [AI](#), and [edge computing](#), 5G could be a critical enabler of the [fourth industrial revolution](#).
 - **Real Time Relay of Information:** One of the primary applications of 5G will be implementation of sensor-embedded networks that will allow real time relay of information across fields such as manufacturing, consumer durables and agriculture.
 - **Efficient Transport Infrastructure:** 5G can also help make transport infrastructure more efficient by making it smart. 5G will enable vehicle-to-vehicle and vehicle-to-infrastructure communication, making driverless cars, among other things, a reality.
- **Improve the Accessibility of Services:** 5G networks could improve the accessibility of services such as [mobile banking](#) and **healthcare**.
- **Local Research:** It will stimulate the local Research and Development (R&D) ecosystem to develop innovative applications tailored to commercial needs.
- **Economic Impact:** 5G is expected to create a cumulative economic impact of USD1 trillion in India by 2035, according to a report by a government-appointed panel (2018).

Evolution from First Generation to Fifth Generation

- **1G** was launched in the **1980s** and worked on **analog radio signals** and supported **only voice**

calls.

- **2G** was launched in the **1990s** which uses **digital radio signals** and supported **both voice and data transmission** with a bandwidth of 64 Kbps.
- **3G** was launched in the **2000s** with a **speed of 1 Mbps to 2 Mbps** and it has the ability to transmit telephone signals including **digitised voice, video calls and conferencing.**
- **4G** was launched in **2009** with a peak **speed of 100 Mbps to 1 Gbps** and it also enables **3D virtual reality.**

[Source: PIB](#)

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