



# The Big Picture: 5G - The Road Ahead

## 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](#).

- The TSPs have been asked to conduct 5G trials **in rural & semi urban areas as well**.
- [5G](#) technology is expected to deliver a **greater spectrum efficiency** and better download speeds.

## Key Points

- **Collaboration among Business Giants:** Bharti Airtel has joined forces with TATA Group to develop a 5G network, Reliance Jio has also tied up with Google Cloud for its 5G solutions.
  - Jio has begun 5G trials in Mumbai using its indigenously developed equipment.
  - The 5G network of Airtel was able to deliver a throughput of over 1 Gbps speed.
- **Auctions by TRAI:** The [Telecom Regulatory Authority of India \(TRAI\)](#) will hold auctions for the 5G spectrum in India.
- **5G Technology Rollout:** The [Standing Committee on Information Technology](#) was informed that 5G will roll out in India to some extent for specific uses, by the end of the calendar year 2021 or beginning of 2022.
  - [4G Internet Service](#) is expected to continue in India for at least another 5-6 years.
- **5G Key Features:** 5G technology is expected to deliver improved user experience in terms of data download rates (expected to be 10 times that of 4G), up to three times greater spectrum efficiency, and ultra-low latency.
- **Applications in Trials:** 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.

## Fifth Generation (5G) Technology

- **High Speed Technology:** 5G is the fifth generation cellular technology that will increase the downloading and uploading speeds over the mobile network.
  - 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 also reduce the latency i.e. the time taken by a network to respond.
- **Machine-to-Machine Interaction:** 5G will be the first technology to facilitate machine-to-machine communication, the foundation of [Internet of Things \(IoT\)](#).
  - Combined with IoT, cloud, [big data](#), [AI](#), and [edge computing](#), 5G could be a critical enabler of the [fourth industrial revolution](#).
- **Boost to the Economy:** 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).
  - It will give a huge amount of economic boost to India by increased connectivity between machines and various sectors which will in turn increase efficiency.
  - Production will also increase which would lead to huge revenue collections.

- **Collaborative Network Deployment:** 5G will lead to, for the first time, the business verticals and technical verticals come together for network deployment.
  - Earlier, the telecommunications used to discuss internally and deploy networks but now, the businesses, technology companies and [cyber](#) experts will be coming together for deploying networks.
- **Focus on Capacity:** In 5G, the focus has been exerted upon the capacity rather than the range of the network.
  - However, in the rural areas, the range of the network is required more than bandwidth as the areas are not as densely populated and industrialised as the urban areas.
    - The range will be compensated by deploying more small cells in the required areas.

## Issues Associated

- **India as a Late Adopter:** Countries in the Asia-Pacific region, including India, Bangladesh and Indonesia are late in adopting 5G technology, hence, will get insignificant revenue from the service.
  - For the late adopters the 5G mobile service revenues are not expected over the next 12-18 months.
- **Lesser Government Subsidies:** A low likelihood of government subsidies is expected, given the history of high reserve prices set by the governments for spectrum auctions amid [ongoing fiscal deficits](#).
- **Digital Divide:** 5G will not bridge the [digital divide among the rural and urban areas](#) in the short term, rather increase it as the business case of 5G even in urban areas does not have maximum accessibility.
  - Therefore, it will not be easily available in rural areas too.
- **5G, A Niche Service:** 5G will be a niche service unlike 3g and 4g which were pervasive services. It will get intensified over a comparatively longer period of time.
  - The rollout of 5G technology will be different from the one seen in 4g; it will be introduced in specific sectors and areas.
- **Inadequate Accessibility of Previous Technology:** The consumers are still grappling with basic network issues like call drops and interrupted data services.
  - There are still areas where 4G networks have not stabilised causing frequent disruptions in internet services.
  - It is important to meet the quality of service parameters of existing 4G networks before embarking on a new 5G platform.
- **Enabling Critical Infrastructures:** 5G will require a fundamental change to the core architecture of the communication system. The major flaw of data transfer using 5G is that it can't carry data over longer distances. Hence, even 5G technology needs to be augmented to enable infrastructure.
- **Financial Liability on Consumers:** For transition from 4G to 5G technology, one has to upgrade to the latest cellular technology, thereby creating financial liability on consumers.

## Way Forward

- **Bridging the Rural-urban Gap:** 5G can be deployed at different band spectrums and at the low band spectrum, the range is much longer which is helpful for the rural areas.
- **Government's Assistance:** The government has complete control over the inputs. One of the key inputs of 5G is the band spectrum.
  - By managing the design of the spectrums, the government can control the price to be paid by the people.
  - The government shall support the telecom companies to roll out networks which are sustainable and affordable for the public.
- **Tackling the Spectrum Pricing Issue:** The government in recent times, has had two failed auctions. The latter failed to attract any bids in the 5G spectrum.
  - The current proposals for the reserve price clearly suggest the need to change the prices in order to conduct a successful auction.
  - The pricing will have to be worked out keeping in mind the financial stress in the sector and affordability of services.
- **Enabling the Manufacturing Sector in India:** As 5G starts taking shape in India, it is important

to strengthen its domestic telecommunication manufacturing market so that it is not only the users of 5G in India, but also the manufacturers and providers of these technologies who will be able to make a mark in the global arena

- **Viable Technology from Consumers' Perspective:** For widespread 5G deployment, it needs to become financially viable otherwise rural integration will remain a pipe dream.
- Also, the 5G technology has to be viable to the telecom operators too.

## Conclusion

- 5G Technology is expected to usher a new era in the technology sector. As far as the nationwide deployment of the technology is concerned, India still has a long way to go.
  - Bringing down the spectrum prices and bridging the rural-urban gap by increasing the accessibility of networks to hinterlands are a few key areas of focus.
- The ultimate goal is to shift to a technology that facilitates the requirements of both the rural and urban users and the telecom sector.

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