

# RSTV

## PERSPECTIVE: 5G ROLLOUT



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### Context

- With **Industrial Revolution (IR) 4.0** broadband, especially mobile broadband, has become an integral part of the daily lives of citizens.
- The rapid expansion of 4G services across India in the last few years gave a boost to digitization.
- Now the time has come for **5G** which has the **huge potential** to work as a catalyst in achieving larger overall economic growth for the country.
- The government of India recently announced the **72 GHz of the spectrum** with a validity period of 20 years will be **put to auction** to be held in July 2022 for the rollout of 5G technology-based services capable of providing speed and capacities which would be about 10 times higher than what is possible through the current 4G services.
- The government has also allowed for the setting up of **captive 5G networks** by big tech firms.

### What is G?

- The G stands for **GENERATION**. While connected to the internet, the speed depends upon the signal strength that has been shown in alphabets like 2G, 3G, 4G, etc.
- Each Generation is defined as a set of telephone network standards, which detail the **technological implementation** of a particular mobile phone system.

- The speed increases and the technology used to achieve that speed also changes. E.g., 1G offers 2.4 kbps, 2G offers 64 Kbps and is based on GSM, 3G offers 144 kbps-2 Mbps whereas 4G offers 100 Mbps - 1 Gbps and is based on LTE technology.

### Different types of G

- **1G - First Generation:**
  - Cell phones began with 1G technology in the 1980s. 1G is the first generation of wireless cellular technology. **1G support-voice-only calls.**
  - 1G is analogue technology, and the phones using it had poor battery life and voice quality, little security, and were prone to dropped calls.
  - The maximum speed of 1G technology is 2.4 Kbps.
- **2G – Second Generation:**
  - Cell phones received their first major upgrade when their technology went from 1G to 2G. This leap took place in Finland in 1991 on GSM networks and effectively took cell phones from analogue to digital communications.
  - The 2G telephone technology introduced call and text encryption, along with data services such as **SMS, picture messages, and MMS.**
  - Although 2G replaced 1G and is superseded by later technology versions, it's still used around the world.
  - The maximum speed of 2G with General Packet Radio Service (GPRS) is 50 Kbps. The max theoretical speed is 384 Kbps with Enhanced Data Rates for GSM Evolution (EDGE). EDGE+ can get up to 1.3 Mbps.
- **3G – Third Generation:**
  - The introduction of 3G networks in 1998 ushered in **more data, video calling and mobile internet** for the cell phone.
  - The term "mobile broadband" was first applied to 3G cellular technology.
  - Like 2G, 3G evolved into the much faster 3.5G and 3.75G as more features were introduced to bring about 4G.
  - The maximum speed of 3G was around 2 Mbps for non-moving devices and 384 Kbps for moving vehicles.
- **4G – Fourth Generation:**
  - The fourth generation of networking, which was released in 2008, is 4G.
  - It supports mobile web access like 3G does and also **gaming services, HD mobile TV, video conferencing, 3D TV, and other features that demand high speeds.**
  - The max speed of a 4G network when the device is moving is 100 Mbps. The speed is 1 Gbps for low-mobility communication such as when the caller is stationary or walking.
  - Most current cell phone models support both 4G and 3G technologies.
- **5G – Fifth Generation:**
  - 5G promises significantly **faster data rates, higher connection density**, and much lower latency, among other improvements.
  - Some of the plans for 5G include device-to-device communication, better battery consumption, and improved overall wireless coverage.
  - The max speed of 5G is aimed at being as fast as 35.46 Gbps, which is over 35 times faster than 4G.

### What is Spectrum?

- Spectrum refers to the **invisible radio frequencies** that wireless signals travel over.

- Those signals are what enable us to make calls from our mobile devices, tag our friends on Instagram, call an Uber, pull up directions to a destination, and do everything on our mobile devices.

**A lot has been heard and discussed 5G in the past years but several experts raised concerns about its actual implementation on the ground.**

**Once the rollout will begin in July 2022 after the auction, what will be the journey for its implementation?**

- Auction will end in July and services will probably be launched in **August**.
- Its first launch will be in **tier 1 cities and metros** and then tier 2 cities, this will take around 2 to 3 quarters to reach users and it will take more than a year for its **pan India** implementation.

**Internet speed is the foremost thing which has been discussed. The broadband connectivity speed will increase at least 10 times as compared to 4G.**

**How the increased speed will benefit the common citizen of the country?**

- There are three technical features of 5G:
  - **Enhance broadband**
  - **Ultra-reliability**
  - **Low latency**
- The enhanced broadband will boost many uses of the common citizens of the country like **online classes, agriculture, healthcare**, etc. Once it is fully available to the remotest area of the country, the society will be benefited from increased accessibility of a bunch of services.
- Ultra-reliability **connected vehicles** will send signals across the journey for a vehicle like an ambulance and will help clear the traffic.
- As far as low latency is concerned, it will be majorly used for **industrial applications** which are mainly **IR 4.0**. Hence, this will contribute to achieving our Prime Minister's vision of a GDP of \$ 5 trillion economy.

**Spectrum allocation has been made in the past concerning 2G, 3G and 4G. How 5G allocation will be different?**

- There will be **only four big techs** that will be allocated a 5G spectrum. So, whosoever company picks up the spectrum will be very clear about their wants and needs from the spectrum. They would also have well-planned auctioning rather than risk-based. Hence, a very **practical allocation** is expected for the 5G spectrum.
- With PM Modi's expected speech on 15<sup>th</sup> August 2022 on 5G, the four big tech companies would need to fill certain expectations with the use of the 5G spectrum. Hence, **their delivery of service will be very important** and it will depend upon their investments in spectrum vis-à-vis corresponding investments that they need to bring in a more practical way.
- Whereas the buying will be more for the **business-based 5G applications**.
- 5G will not be the end of the road, there will be 6G in near future. So, a lot of **smart buying of the spectrum** is expected this time.

**Smart buying and smart investment are expected this time and the respective allocation is only for 20 years during which the company may surrender in 10 years. Hence, a major investment in 5G industrial applications is expected.**

### How this technology is going to bring transformative change and will impact the lives of common people?

- Unlike others 5G is the first G which is **stepping out of the telecom vertical** and going across all the verticals like; manufacturing, agriculture, logistics & transportation, healthcare, etc. That means it is not just telecom companies but all non-telecom companies also will get benefited.
- Once non-telecom companies like manufacturing get benefited from 5G, it will spread the domino effect on other sectors too.
- Hence, it will ultimately benefit or transform the lives of the common citizens of the country.

### Will 5G technology will help transform the non-telecom sectors?

- One of 5G's specifications is a massive **machine-to-machine communication** which was not even present in 4G. The ultra-reliability connection between machines is an example of machine-to-machine communication.
- 5G is not limited to industrial applications, it can be used in agriculture, healthcare and even warehouse management. The common citizen will be benefited but **industries will benefit more** comparatively. This will ultimately contribute to the higher GDP of the country.
- There are **four routes** identified through which enterprise business will come in the telecom domain:
  - **Network slicing**
    - Network slicing is a form of virtual network architecture using the same principles behind software-defined networking (SDN) and network functions virtualisation (NFV) in fixed networks. SDN and NFV are now being commercially deployed to deliver greater network flexibility by allowing traditional network architectures to be partitioned into virtual elements that can be linked (also through software).
    - Network slicing allows multiple virtual networks to be created on top of a common shared physical infrastructure.
    - The virtual networks are then customised to meet the specific needs of applications, services, devices, customers or operators.
  - **Telecom Service providers (TSPs) can provide a network for the business enterprise**
  - **TSPs will lease out their own acquired spectrum for the industry**
  - **As suggested by the TRAI, a separate chunk of the spectrum for which there is a demand analysis and based on that there will be separate reference by the regulator.**

### With the use of 5G, many telecoms, as well as the non-telecom sector will be benefited, what will be the economic impact?

- Telecom movement started in the early 90s in India and followed a particular trajectory after that some developments occurred which were very beneficial.
- At present, the **non-telecom sectors are not yet developed** to reap the benefits of 5G technology. However, once the telecom sector can extract benefits from 5G it will be very beneficial for all the sectors.
- The huge potential of 5G will generate employment in the economy; then purchasing power will increase demand and then supply i.e., production (GDP) which will further increase national Income and per capita income and again purchasing power in the economy.

### What are going to be the low-hanging fruits from the industrial perspective in terms of achievements?

- 5G technology at global, for example, Germany has issued more than 70 private 5G network licenses, in Italy Livorno Port they have established a 5G network for improving the transportation & logistics and warehouses to shorten the turnaround time of ships.
- On similar lines, once 5G spectrum allocation is done India can use it to develop its largest ports like **Jawaharlal Nehru Port** and **Chennai Port**.
- Even private firms like L&T, Tata and even Maruti have huge potential to extract this technology. Hence, there are several low-hanging fruits in India which can improve the working environment in India but also largely benefit society.

### Challenges for 5G implementation

- The biggest drawback of a network with a **high band frequency** in the remote rural areas of a vast country like India, it will be very difficult to reach the Internet through a network with a high band frequency. Hence, it will further increase the **digital divide** between rural and urban areas.
- The 5G implementation will create **financial constraints** as one has to upgrade to the latest cellular technology to use it.
- **Digital literacy** is another point of concern in India, as the majority of the population are residing in rural areas, the potential might not be achieved to its fullest.
- 5G will be a **niche service** unlike 3G and 4G which were distributive services. It will get intensified over a comparatively longer period and concentrated in particular sectors.

### Way forward

- The 5G network rollout will add Rs 35 lakh crores to the Indian economy, increasing the pace of development and creating jobs.
- It will bring positive changes in the governance of the country, ease of living and Ease of Doing Business (EoDB).
- Agriculture, health, education, infrastructure and logistics sectors will have boosted growth.
- The need of the hour is to **bridge the digital divide**. With the increase in demand, there will be an increase in supply including the high-tech products.

<https://sansadtv.nic.in/episode/perspective-5g-rollout-telcos-vs-big-tech-cos-20-june-2022>



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