

5G technology rollout in India in 2022

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In news—The Department of Telecommunications (DoT) announced that 5G telecom services are set to be rolled out in selected cities in India in 2022.

Key updates-

- **The cities which are set to get the 5G telecom services in 2022 include** Gurugram, Bangalore, Kolkata, Mumbai, Chandigarh, Delhi, Jamnagar, Ahmadabad, Chennai, Hyderabad, Lucknow, Pune, and Gandhinagar.
- Leading telecom service providers Bharti Airtel, Reliance Jio and Vodafone Idea, have established 5G trials sites in these cities.
- Apart from the leading telecom operators and **smartphone manufacturers, the government is also involved actively to facilitate the rollout of 5G services.**
- The Department of Telecom has roped in **leading research institutions** for development and testing of 5G technology.
- **Eight agencies** – Indian Institute of Technology (IIT) Bombay, IIT Delhi, IIT Hyderabad, IIT Madras, IIT Kanpur, Indian Institute of Science (IISC) Bangalore, Society for Applied Microwave Electronics Engineering & Research (SAMEER) and Centre of Excellence in Wireless Technology (CEWiT) – **are involved in the research project called ‘Indigenous 5G Test bed project’.**
- The Indigenous 5G Test bed project started in 2018 and is set to be completed by December 31, 2021.
- The project has been funded by the Department of Telecom. The department has spent Rs224 crore on this project.
- **Test bed refers to creating a specific environment for**

testing the products or services. It includes hardware, software, operating system, and network configuration.

- As the testing is in the final stage, allocation of the spectrum would be critical in deciding the fate of the commercial launch of 5G in the country.
- The Department of Telecom has allocated spectrum to Bharti Airtel, Reliance Jio, Vodafone Idea and MTNL for 5G trials. Ericsson, Nokia, Samsung and Mavenir also engaged in the trials.

What is 5G?

- 5G refers to the 5th generation mobile network. When rolled out, **it will represent a quantum leap over the current 4G mobile networks.**
- If successfully implemented, **it can deliver 10 times faster internet and more than 10 times improvement in latency** (the time difference between sending and receiving messages) over 4G
- 5G is expected to reduce latency to 1 millisecond (one thousandth of a second).
- 5G also comes with substantially more capacity and hence will enable more connected devices without issues of network congestion.

Major Difference between 5G and 4G-

With respect to speed:

- 4G can currently reach top speeds of up to 100 Mbps, though real-world performance is generally no more than 35 Mbps.
- 5G has the **potential to be 100 times faster than 4G**, with a top theoretical speed around 20 Gbps and current, real-world speeds from 50 Mbps to 3 Gbps.

With respect to latency:

- Latency is a measure of the time it takes a packet of

information to travel between two points

- Latency in 4G networks is currently about 50 milliseconds, while 5G networks are expected to shrink that to an impressive 1 ms.

With respect to coverage:

- 5G will take several years to reach a level of coverage similar to 4G, and it will have different implementations (high-, medium-, and low-band 5G), each with its own speed and bandwidth.

With respect to bandwidth:

- 5G is expected to have significantly more bandwidth, or capacity, than 4G as well. In part, this is because 5G will make much more efficient use of available spectrum.
- 4G uses a narrow slice of the available spectrum from 600 MHz to 2.5 GHz, but 5G is divided into three different bands.
- Each band has its own frequency range and speed, and will have different applications and use cases for consumers, businesses, and industries

Difference between 5G and other generations-

