

What to Expect From **5G Wireless**

5G or the 5th generation mobile network seems to be the most awaited technology. Governments are huddled in discussions around the world. Technologists are blogging and talking about it on webinars, it's often in the media and it's difficult not to feel the excitement around it. Here is an attempt to lay the facts on the table and get to the bottom of it.

Let's step back for a minute and appreciate all the benefits that 'wireless revolution' has brought to the world. The core product value of wireless revolves around mobility, reach, scalability, ease of deployment and all this at very affordable costs as the unit economics of mobile are far better than of fixed line. 5G is a significant evolution over 4G and supports a myriad of different applications making it far more efficient to leverage sensors, actuators, machines, enable big data, AI and ultimately Industry 4.0 and "smart" everything. It's important to form a realistic perspective around 5G and what it will deliver and by when. This is a nascent stage for 5G, and full maturity is expected incrementally over the next 6 to 7 years. It is here to stay for a long time, at least for the next 15 years based on a few estimates.

The evolutionary path to 5G had 3 distinct stages, each delivering significantly higher value than the previous one.

2G - Introduced digital voice

3G - Enabled some basic data features like email and internet access

4G - Brought in the era of smart phones and an evolved app ecosystem that require high internet speeds (gaming, video etc.)

5G - Will bring in many evolutionary and revolutionary services

So, what will 5G deliver and when?

There are 3 areas that 5G will transform:

1. **Enhance mobile broadband (eMBB)** - 5G can offer much higher speeds (2~20Gbps) equivalent to what we currently get on fiber-based connections as compared to the theoretical max limit of 1Gbps on 4G/LTE. Many phone brands now offer a range of 5G enabled handsets. The higher speed, however, by itself don't mean much in the absence of an application ecosystem that leverages it to offer newer services of value to end users.
2. **Massive scale computing** - 5G significantly ups the game in terms of collecting massive amounts of data from millions of sensors and actuators in massive IOT deployments, wearables etc. in real time and enables big data analytics and AI to solve substantial problems in the world like in health care global warming etc. Realizing this potential requires a focus on innovation and an ecosystem that makes it possible to access capital and resources.
3. **Ultra-Reliable low latency services (URLLS)** - The intersection of machine-to-machine communication with URLLS is the most interesting and fascinating feature of 5G. This holds the promise of unleashing new services which, hitherto, were not possible at scale like remote surgeries, Telematics, industry 4.0 and "smart" everything. Just to give a perspective, here are some examples - In smart cities it enables intelligent transportation, reducing congestion and thereby carbon emissions, in manufacturing it provides a high degree of locational flexibility and a massively efficiently orchestrated manufacturing process, in transportation V2X (vehicle-human, vehicle-vehicle, vehicle-kerb) features will radically change the way people and goods are transported. We are just scratching the surface in terms of the possibilities at the moment and the real opportunities are many orders of magnitude higher. 5G network deployments are expensive as compared to the earlier Gs given the shorter signal range, therefore, requiring higher density of base station infrastructure. There needs to be a compelling economic rationale and incentive for Telcos to deploy at this scale. The use of 5G in URLLS requires deep changes in the industry processes and technologies which translates to massive new investments to be made by Industry. We have to wait and watch how these forces play out on the ground.

In conclusion, every incremental G has significantly transformed human life and therefore, the palpable excitement around the new era of 5G is understandable. However, what we have to bear in mind is that the real benefits of 5G will not happen overnight. It's a story that will unfold over the next 5 to 7 years. It is for the Governments, Enterprises and people to take

a stand on how we would like use it - as a wave of mindless consumer consumption driven paranoia which at best marginally improves human life or as a force for good to counter existential threats for humans in the world.