

Upgrade to 5G Costs \$200 Billion a Year, May Not Be Worth It

By

Olga Kharif and Scott Moritz, Bloomberg, December 18, 2017

In the wildest dreams of wireless engineers, the mobile network of the future controls our cars, lets our refrigerators talk to the grocery store to order more milk, and provides fast, reliable broadband connections to our homes so we can sever ties with cable companies.

But it's going to cost the mobile-phone companies, chipmakers, device manufacturers and software developers about US\$200 billion a year in research and capital spending to get to that point, with engineers labouring to work around interference from trees and rain and provide a strong enough signal to handle so much demand.

Even if they're successful, making a profit on that investment will be difficult in an industry that isn't growing much anymore. In most developed countries, the wireless market has reached saturation, and there are few new subscribers to sign up without undercutting rivals on price.

"Historically, 1G to 4G, it's been a pretty straightforward evolution from the point of view of business and technology," said Chetan Sharma, a wireless consultant. "The revenue grew proportionate to the usage."

The future of 5G, as the next-generation wireless network is known, is already beginning, as a handful of carriers including move from trials to deployments. The first technical standards everyone can use to design their networks, phones and chips for 5G will be released at a summit this week in Lisbon.

Most mobile-phone companies are targeting 2020 for the initial rollout of the technology, which promises 10 times faster speeds and lower latency, or lag time in transferring data when it's requested.

After that, wireless carriers' revenue will grow about 2.5 percent a year through 2025 - only about half a percentage point more than their growth in the prior five years, according to industry group GSMA.

This time around, it's not clear that 5G will translate into more revenue until perhaps five or 10 years from now, Sharma said.

New applications like the Internet of Things - using wireless connectivity to let machines on the factory floor talk to each other, and for autonomous cars on the freeway to talk to light signals - may take years to materialise, and may not pay that much.

After all, many of these applications can be handled by Wi-Fi networks, while others - like driverless cars - would likely use onboard communications rather than cellular for safety reasons, said Craig Moffett, an analyst with MoffettNathanson.

"What's left in the middle is undoubtedly still a real opportunity, but it's not clear it's a very big one," he said.

First, engineers have to figure out how to make 5G work.

Rain, fog and trees have long been the enemy of high frequency radio waves.

Given the relatively short, fragile nature of high-frequency 5G signals, carriers have to configure networks differently. They're shifting more of the network hardware from tall towers that are scattered to spread signals over broad areas, to smaller, more clustered sites like rooftops and street poles.

These "small cells" use cabinets that look like mini-refrigerators mounted on poles or rooftops. Inside the cabinets there's an array of more than 1,000 antennas. In dense, urban areas, network engineers will have to install lots of small cells to handle demand for data, adding to the costs of 5G.

Some companies aim to make money by offering up 5G as an alternative to home broadband connections, competing with cable and landline phone providers. High costs could make that commercially unviable.

"Carriers are all looking at 5G for fixed wireless broadband, even though the technology isn't particularly well suited to that application," Moffett said.

"That's largely because it is almost impossible to identify any other real revenue opportunities for the technology."