



5G Connectivity

The future roll out of 5G services across global cities has the potential to transform transport and urban infrastructure deployment, creating new connections and revolutionizing interactions between people and technology. Imagine cities of the future where cars, buildings, people and infrastructure can talk to each other wirelessly to improve safety, energy efficiency and quality of life all through a virtual electronic nervous system. While this may seem a visionary concept, many investors and analysts believe the roll-out and application of 5th generation wireless systems already offers the capability to achieve this within years, not decades.

Next generation mobile internet connectivity promises faster upload and download speeds, wider coverage and more stable connections. A number of countries are actively working towards 5G roll-out for late in 2018 or early 2019.

The connectivity 5G mobile internet could offer holds the potential to revolutionise city life, bringing new intelligent efficiencies and ushering in such innovations as driverless taxis, smart grids designed to balance energy needs, smart buildings and smart healthcare facilities via sensors and other devices connected to an 'internet of things.'

Market Enigma

Yet for all the buzz surrounding smart cities and wireless capability, Matthew Griffin, a senior research analyst for BNY Mellon Asset Management North America, says the technology involved is still misunderstood by many.

“There is a lot of confusion in the marketplace about what 5G actually is. The last transition we had in the market was from 3G service to 4G which was largely about increasing the speed of online communication. But 5G is a more complex cellular technology which will enable completely new types of application, allowing users access to new wireless spectrum that was previously unusable with earlier technologies,” he adds.

According to Griffin the improved 'latency' or responsiveness of 5G will allow it to enable next generation applications such as advanced virtual reality, autonomous cars and traffic systems.

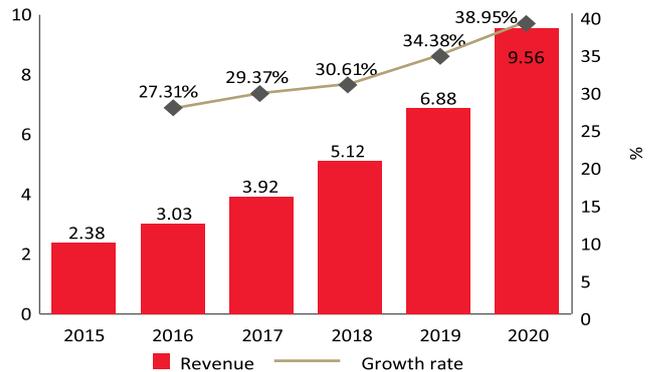
“Lower latency opens up scope for new millisecond time applications such as controlled drones, autonomous vehicles and a host of other applications. 5G is really going to be about the internet of things and there will be a lot more machine to machine communication happening over its wireless networks,” he adds.

While short range wireless services will be an important aspect of 5G, Griffin points out its networks will be heavily dependent on fibre optic cables. Existing 4G operators will also need to upgrade their networks. According to research by ecommerce information platform the Market Reports Center, the 5G network infrastructure market is set to grow at a CAGR of 70%, accounting for US\$28 bn in annual spending by 2025¹.

According to Griffin this development could create a raft of new business and investment opportunities.

“The near-term opportunities lie in areas such as test equipment and the prototype equipment needed to start manufacturing equipment for 5G. We are in the early stages of deployment but new fibre services should gain significant traction over the next few years as 5G adoption and development accelerate. Companies that sell fibre and other optical equipment and those that actually dig the ditches may also benefit,” he says.

Global 5G Equipment Market 2015-2020 (US\$ Billions)



Source: Technavio as at 18 November 2018.

In the US, Griffin notes the roll out of 5G has largely been driven by private sector operators, often working in cooperation with or brokering access deals with local authorities and other public sector institutions.

Elsewhere, Jim Lydotes, senior portfolio manager for the Pinnacle BNY Mellon Global Infrastructure Fund, sees rich potential in urban areas in Europe and the Middle East which have invested in and have either installed or are installing fibre optic networks but have yet to fully monetise those assets. Independent research by Zion Market Research also predicts the global fibre optics market could reach US\$3.72bn in size by 2022².

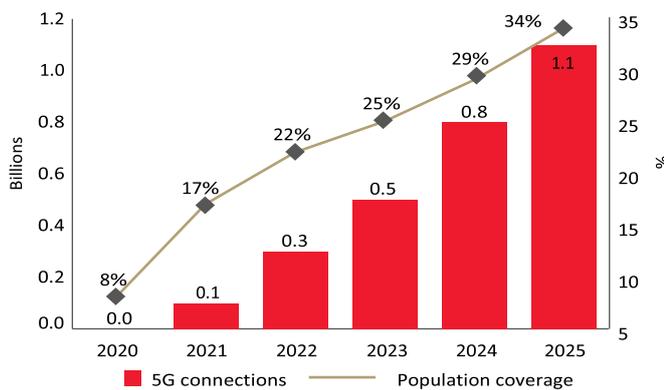
Commenting on the regional roll-out of 5G services, Lydotes says: “A lot of operators have spent the last couple of years deploying fibre and today are now the owners of those fibre assets. While they have spent money on this infrastructure in many cases it is underutilised.”

¹ Cision PR newswire/Market Reports Center. 5G Network Infrastructure Market to Grow at a CAGR of 70%, Accounting for \$28 Billion in Annual Spending by 2025. 20 March 2017.

² Zion Market Research. Fiber Optics Market for Telecom & Broadband, Healthcare, Defense, Private Data Networks, and Other Applications: Global Industry Perspective, Comprehensive Analysis, and Forecast, 2016-2022. As at 16 January 2017.

“As we move closer towards an interconnected world, we expect the market to put a higher value on those fibre infrastructure assets and for there to be opportunities to profit there. In the final analysis, smart cities could encompass a million applications which we haven’t even thought of yet, but you have to enable it first.”

Forecast 5G Global Coverage and Adoption



Source: GSMA Intelligence. The 5G era: Age of boundless connectivity and intelligent automation. 27 February 2017.

While 5G applications, the sensors they will utilise and artificial intelligence interfaces they deploy are generally seen as positive progressive technologies, some fear the advent of smart cities could hold a darker side, with the potential to infringe civil liberties.

Security Debate

Commenting, Griffin points to the likely trade-offs that may need to be made between the potential benefits and threats posed by new technologies in areas such as security.

“Real time facial recognition is just one area that cuts both ways in terms of enhancing security while posing some questions about how far its use is acceptable. In theory, existing closed-circuit TVs across cities could be networked in real time to allow facial

recognition to identify known individuals in crowds. Individuals likely to incite riots, for instance, could be apprehended before trouble starts,” he adds.

“This raises some important ethical and legal questions. Are individuals and society as a whole willing to take the benefit of greater safety and security in return for ‘Big brother’ style monitoring from authorities with the power to know everywhere they go and everything they do within their range?”

As with many other strands of digital and computer-based technologies, some fear smart cities could fall prey to hackers, with potentially devastating results.³ Yet Griffin believes 5G should prove more resilient than earlier generation digital transmission systems.

“While fear of hack attacks remains a huge concern, 5G should be more secure than 4G because it involved more advanced technology. Ultimately, any network can be susceptible and there will need to be a societal trade off as to how much people want to automate the services that are available to them,” he adds.

“Again, the benefits of automation are going to have to be weighed against what individuals give up in terms of potential security or security threats such as bringing down a power grid.

I would say it is probably much easier to disrupt a power supply today than it would be if the underlying grid technology was all updated and automated.”

Either way, be it from remote controlled autonomous vehicles to smart medical services, 5G looks set to have a transformational impact on urban life in the decade ahead.

³ Harvard Business Review: Smart Cities Are Going to Be a Security Nightmare. 28 April 2017.

About the Team



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