**Assignment 3 – 5G Deployment**

Most broadband providers started introducing 5G networks in 2019 and it is no longer a myth. With the growing number of devices connecting to the internet, such as mobile phones, laptops and other smart devices, access to the high-speed 5G network is needed. In terms of 5G deployment across the globe, the USA, South Korea and China are currently leading. In the United States, telecommunications firms such as T-Mobile, Sprint and Verizon provide about 7,583 cities across the United States with 5G networks. The user benefits with enhanced mobile broadband, low latency, increased coverage and connection density. Problems like buffer time delay to load movies, pixelated video calls and eliminate the lag time to connect to a network. 5G-supported system architectures need to deal with specifications like the ability to support multiple Machine to Machine (M2M) communications, reduce energy consumption, and support indoor or small cell traffic.

Table

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Figure 1

Figure 2

Several challenges occur in the 5G deployment such as cost to build and buy, government regulations and so forth. The current range provided for telecommunication devices is 700MHz. For 5G network, the frequency band requirements are 300Ghz. As per figure 1, the spectrum is heavily populated and hence modifications of the existing cell towers are needed. Signal propagation over large distance is an issue due to factors such as atmospheric gases and solid materials since it reduces frequency for propagation shown in figure 2. Hence, greater number of antennas, base stations and repeaters have to be installed for additional range.

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