

Wireless Communications 2020

First Abstract–Invited Paper

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Nearly every forecast of future mobile data usage projects ten to twenty times current (2013) usage volume by 2020. These levels of data intensity put tremendous strain on wireless communications networks, and have a direct impact on the architecture and implementation of the base station and user-equipment (UE).

Radio engineers measure data system capacity in bits per second per hertz per unit area (bps/Hz/mi²). The units imply ways to increase system capacity:

- Increase bits per second (higher order modulation and/or multiple antenna techniques, e.g., MIMO)
- Increase Hz (higher bandwidths)
- Fewer square miles (higher base station density; more sites per square mile)

These three points drive an interrelated set of responses from both the base station and UE hardware. Additionally, they all have “knock-on” effects on non-radio items like battery life and form factor. On top of it all is the need for processing power to manage it all. This invited presentation will discuss these changing requirements and how they are anticipated to impact the creation of wireless network hardware built to handle 2020 traffic.