

# UltraDense Networks



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## *The New Wireless Frontier for Enabling 5G Access*

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**T**he extreme traffic load that future wireless networks are expected to accommodate requires a rethinking of the system design. The initial estimations indicate that, unlike the evolutionary path of previous cellular generations that was based on spectral efficiency improvements, the most substantial amount of future system performance gains will be obtained by means of network infrastructure densification. By increasing the density of operator-deployed infrastructure elements along with incorporation of user-deployed access nodes (ANs) and mobile user devices acting as infrastructure prosumers, having one or more ANs exclusively dedicated to each user is expected to become feasible, introducing the ultradense network (UDN) paradigm. Although it is clear that UDNs are able to take advantage of the significant benefits provided by proximal transmissions and increased spatial reuse of system resources, large node density and irregular deployment introduce new challenges, mainly due to the interference environment characteristics that are vastly different from previous cellular deployments. This article attempts to provide insights on fundamental issues related to UDN deployment, such as determining the infrastructure density required to support the given traffic load requirements and the