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# Hyperconnected Enterprises

## Entering the era of Intelligent Connectivity and 6G communication technologies

RESEARCH SPOTLIGHT

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# Introduction

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Sixth-generation wireless communications, commonly known as 6G, is a promising approach to integrating terrestrial, airborne, and maritime communications, providing additional reliability and speed without compromising required latency. The upcoming explosive connectivity will enable further scalability of many heterogeneous IoT devices that will support innovative services such as intelligent traffic, environmental monitoring, augmented reality and virtual reality, video transmission in connected vehicles and drones, etc.

This fact is further reinforced by the projected growth of the IoT market to 25 billion devices by 2025. However, the establishment of specific 6G standards is underway, and it is estimated that international standardization bodies will define the standards for 6G by 2030. As a result, information and communication technologies (ICT) should be flexible and robust with respect to the massive data generated by mobile devices due to urbanization and smart city ecosystems such as smart transportation, smart healthcare, and smart buildings.[1]

6G The 6G ecosystem consists of many stakeholders, from device manufacturers to application developers. In particular, chipset manufacturers will differentiate their products to meet new technology expectations and requirements, while handset and other device vendors will change their products to support the chipsets. Ultimately, all manufacturers will support mobile network operators in realizing and marketing their mobile services.

Given the United Nations 2030 Sustainability Development Goals, there is a need and commitment for various emerging technologies to meet specific goals, communication challenges, and new application requirements. Driven by the latter, 6G must introduce new technical capabilities and performance metrics. The 5G network is mature enough to meet the performance requirements of existing vertical markets. However, these areas require more advanced AI-driven tools that are human-centric, ubiquitous, fully automated, and require dedicated resources that cannot be met with current 5G networks.[2]

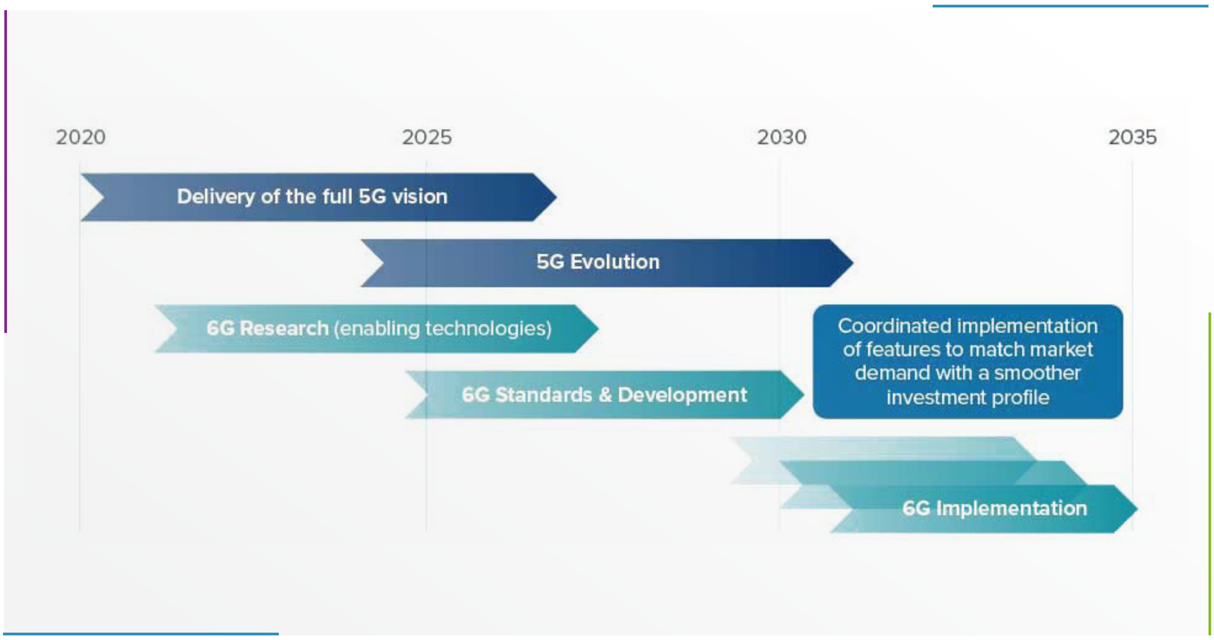


**Figure 1**
Roadmap timelines for 6G deployment. Institute for Communication Systems. (2020). 6G Wireless: A new strategic vision. University of Surrey. Retrieved from: https://www.surrey.ac.uk/sites/default/files/2020-11/6g-wireless-a-new-strategic-vision-paper.pdf


6G mobile communications are expected to make a significant contribution to addressing a range of social issues and achieving the goals of the UN. The hyperconnectivity enabled by this type of communication will provide access to needed information, resources, and social services without time and location constraints. Wider deployment of 6G will reduce regional and societal disparities in infrastructure and economic opportunity, providing alternatives to agricultural options, mass urbanization, and related problems.[3]

These next-generation wireless channels exist in various frequency bands and in multiple scenarios with the characteristics of each channel varying widely. In recent years, great efforts have been made to characterize 6G channels. THz channel's use and characterization are among the fundamental modules for the development and implementation of the state-of-the-art 6G communications. A flexible, complete and accurate THz channel is extremely important for bandwidth allocation requirements due to its non-stationary nature.[4]

# Section 1

Key megatrends and drivers for intelligent connectivity

RESEARCH SPOTLIGHT

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