



# Spectrum Position Statement

FiRa™ Consortium | January 2023



---

# Introduction

Ultra-wideband (UWB) is a short-range, wireless technology that makes use of wideband radio waves. Compared to Wi-Fi or Bluetooth®, UWB operates in higher frequency bands and uses a wider bandwidth (500 megahertz or more). These special characteristics of UWB allow it to measure distance and to determine position much more accurately than other technologies, providing the basis for building more secure applications.

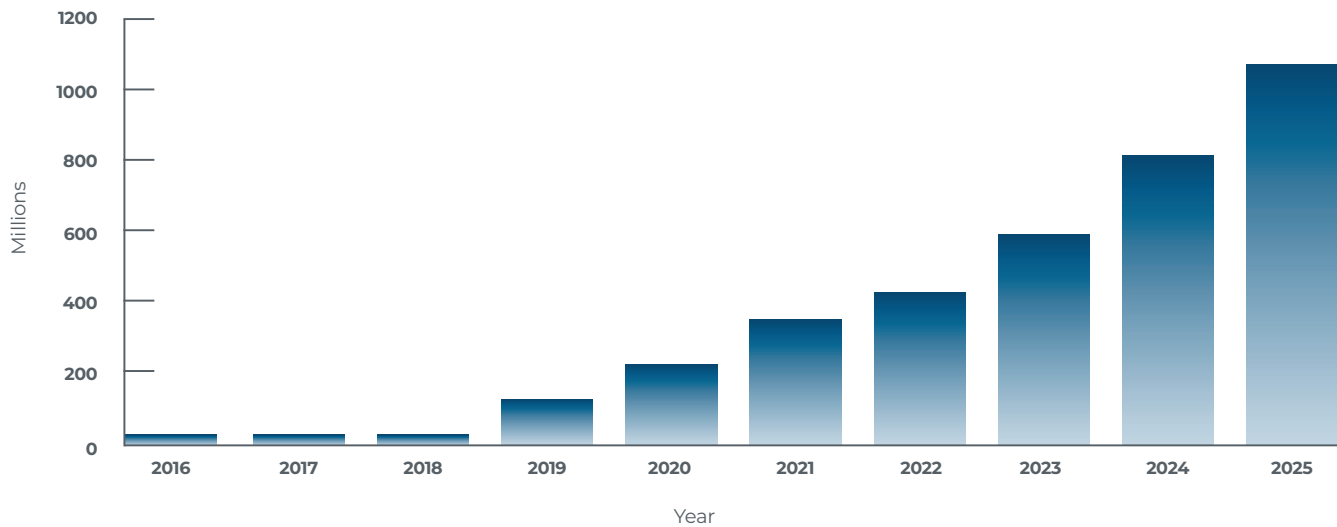
After decades of discussion and development, UWB technology is now demonstrating its potential and quickly becoming a vital mainstream wireless technology like Wi-Fi and Bluetooth®.

As such, FiRa™ Consortium recommends preserving the 7.7–9.3 GHz band for UWB, not to study and create identifications for International Mobile Telecommunications (IMT) in this band.



## Social and Economic Impact

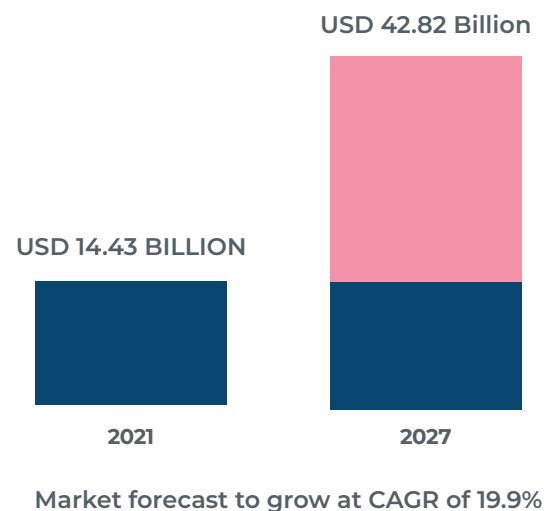
One data point that supports the expected growth of UWB is from ABI Research. **Figure 1** shows that UWB-enabled devices shipped globally are poised to grow from 109 million devices in 2019 to over 1 billion devices by 2025. Cumulatively, 3.6 billion UWB-enabled devices will be shipped worldwide by 2025. In fact, the UWB market is projected to grow by double digit percentages for the foreseeable future.<sup>1</sup>



**Figure 1** UWB-Enabled Device Shipments, 2020 to 2025  
Source: ABI Research

The other segments driving growth of UWB are Internet of Things (IoT) and Real-Time Location Systems (RTLS). There is a rising demand for UWB technology in RTLS applications. In a report published in August 2021, MarketsandMarkets estimated that the global indoor location market will grow from about \$7 billion this year to \$19.7 billion by 2026, a CAGR of nearly 23%.<sup>2</sup>

Furthermore, as shown in **Figure 2** to the right, a report from Research and Markets indicated that the global indoor location-based services market size was estimated at USD 14.43 billion in 2021, USD 17.28 billion in 2022, and is projected to grow at a CAGR of 19.9% to reach USD 42.82 billion in 2027.<sup>3</sup>



**Figure 2** The Global Indoor Location-Based Services Market  
Source: Research and Markets

<sup>1</sup> <https://www.allaboutcircuits.com/uploads/articles/UWBWP.pdf>

<sup>2</sup> [https://www.marketsandmarkets.com/Market-Reports/indoor-location-market-989.html?gclid=EAlaIQobChMIutrnsoSw9wIVl21vBB3KNw-mEAAAYASAAEgLoIPD\\_BwE](https://www.marketsandmarkets.com/Market-Reports/indoor-location-market-989.html?gclid=EAlaIQobChMIutrnsoSw9wIVl21vBB3KNw-mEAAAYASAAEgLoIPD_BwE)

<sup>3</sup> <https://www.researchandmarkets.com/reports/4896758/indoor-location-based-services-market-research#rela0-5427261>

## UWB Has Tremendous Potential

In the early 2000's, UWB was foreseen to be used for local high-speed data communication, which never materialized in the market. More recently, UWB is having a renaissance and is now being used in applications in professional settings such as industrial environments.

Since 2019, the addition of the secure fine ranging feature (standardized in IEEE 802.15.4z) has led to adoption in mass market consumer products including devices such as smartphones and smart watches.

Today, there are many real-world examples of UWB being used to address consumer needs for convenience, safety, health, or enjoyment.

Examples include:



Trackers



In-restaurant customer positioning<sup>4</sup>



UWB enhanced soccer balls in the FIFA World Cup<sup>6</sup>



Digital car keys



Health monitoring using UWB radar technology<sup>5</sup>

There is also interest and on-going work in the area of child presence detection systems<sup>7</sup> using UWB in locked cars. This is clearly an important use case in the “safety” category.



<sup>4</sup> <https://www.youtube.com/watch?v=JK2oB7cWxQc>

<sup>5</sup> <https://www.mcknightshomecare.com/a-home-health-patient-monitoring-innovation-ultra-wide-band-uwband-radar/>

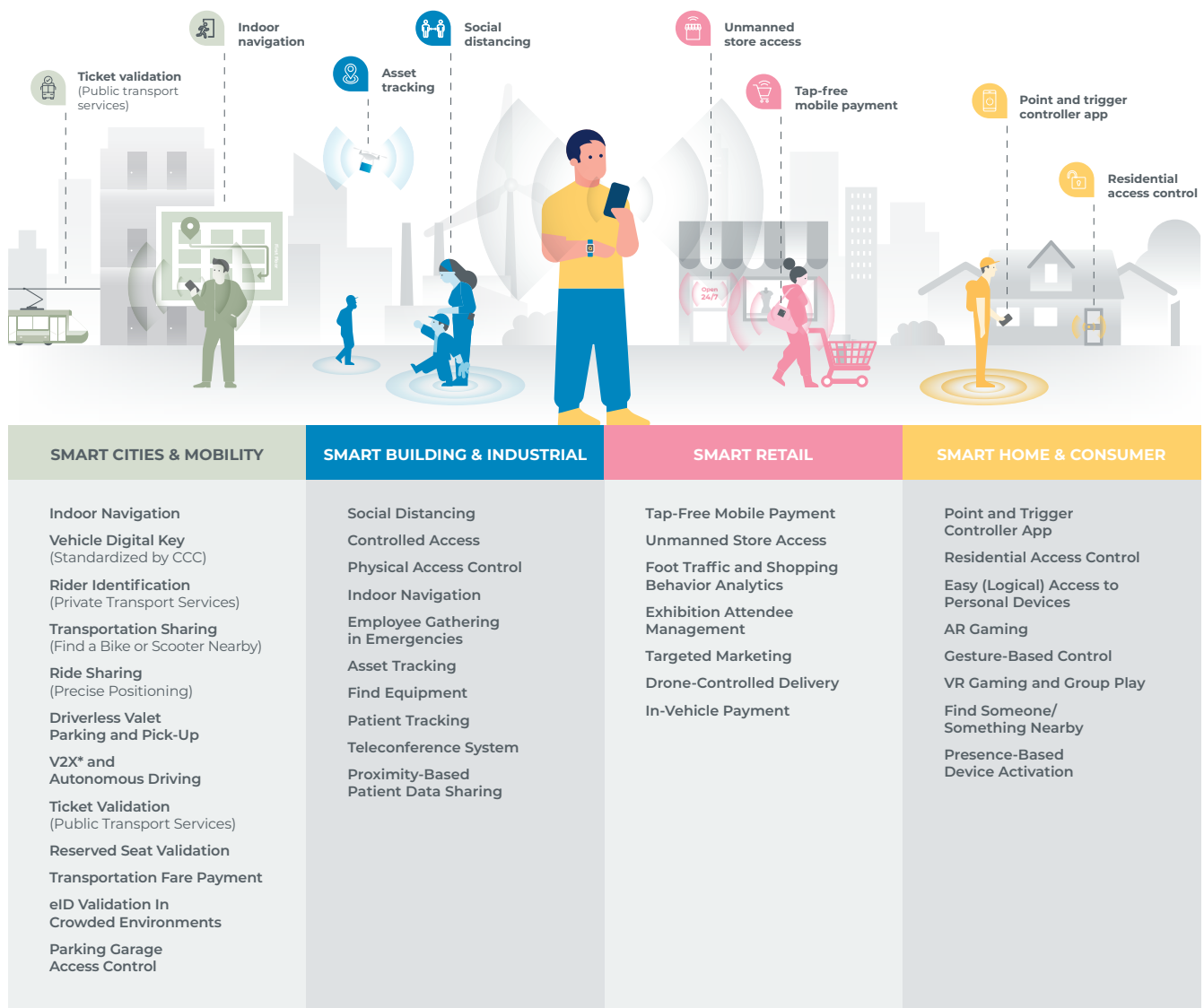
<sup>6</sup> <https://innotechtoday.com/soccer-fans-perplexed-as-picture-of-world-cup-balls-being-charged-goes-viral/>

<sup>7</sup> <https://www.rfidjournal.com/vulnerable-child-presence-detection-with-uwband-radar>

FiRa has identified a wide variety of use cases for UWB across four (4) primary market segments:



Specific use cases within each of these primary market segments are shown in **Figure 3**. Initial areas of focus for FiRa include IoT, secure access, tracking, and navigation. Select use cases detailed below include Access Control, RTLS, Personal and Consumer Device Tracking, and Smart Homes, driving personalized, position aware automation, and secure applications for the future automated society.



**Figure 3** UWB Market Segments and Applications  
Source: FiRa Consortium



---

## Preserve Spectrum for UWB

### UWB and IMT in the same band do not coexist well

UWB applications can coexist extremely well with incumbent spectrum applications in the 6-10 GHz band. As incumbent transmitter deployment is highly localized and UWB transmissions have a very low power and duty cycle, there is no interference with incumbent receivers. However, UWB applications will be unreliable in an IMT band because ubiquitous higher-power IMT transmitters will cause interference on UWB receivers in many situations.

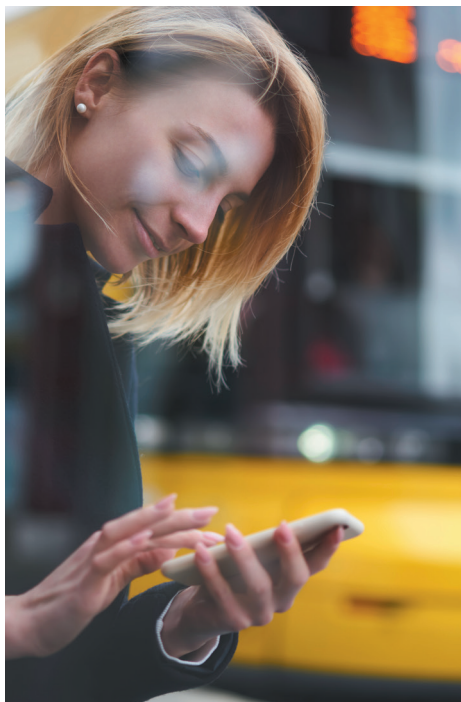
### IMT spectrum identification should recognize UWB market development

At WRC-23, the IMT community will strive to establish the 6 GHz band for IMT identification in specific regions. This overlaps with UWB channels 5 and 6 (6.2-7.3 GHz), which, as a consequence, can no longer be regarded as primary UWB channels.

Furthermore, at WRC-23, the IMT community plans to introduce a new agenda item proposal for WRC-27 to identify more bands for IMT in the 7-24 GHz band, particularly in the lower portion. Such proposals are likely to overlap with UWB channels currently being put in use in the 7-10 GHz band.

### FiRa Consortium recommends preserving the 7.7–9.3 GHz band for UWB, and not to study and identify this band for IMT

UWB requires an unencumbered safe space in the spectrum to fully develop the growing palette of highly valuable UWB applications. The 7.7–9.3 GHz band covers UWB channels 9, 10 and 12. These channels, specifically channel 9, are deemed essential for the development of UWB's potential. UWB combines well with the incumbent spectrum applications in the band. Therefore, FiRa recommends preserving the 7.7–9.3 GHz band for UWB, and not to create identifications for IMT in this band.



#### About FiRa Consortium

*The FiRa Consortium is a member-driven organization dedicated to transforming the way we interact with our environment by enabling precise location awareness for people and devices using the secured fine ranging and positioning capabilities of Ultra-Wideband (UWB) technology. FiRa does this by driving the development of technical specifications and certification, advocating for effective regulations and by defining a broad set of use cases for UWB. To learn more about UWB and the FiRa Consortium, visit [www.firaconsortium.org](http://www.firaconsortium.org).*



© 2023 FiRa Consortium. All rights reserved. FiRa, FiRa Consortium, the FiRa logo, the FiRa Certified logo, and FiRa tagline are trademarks or registered trademarks of FiRa Consortium or its licensor(s)/supplier(s) in the US and other countries and may not be used without permission. All other trademarks, service marks, and product or service names are trademarks or registered trademarks of their respective owners.