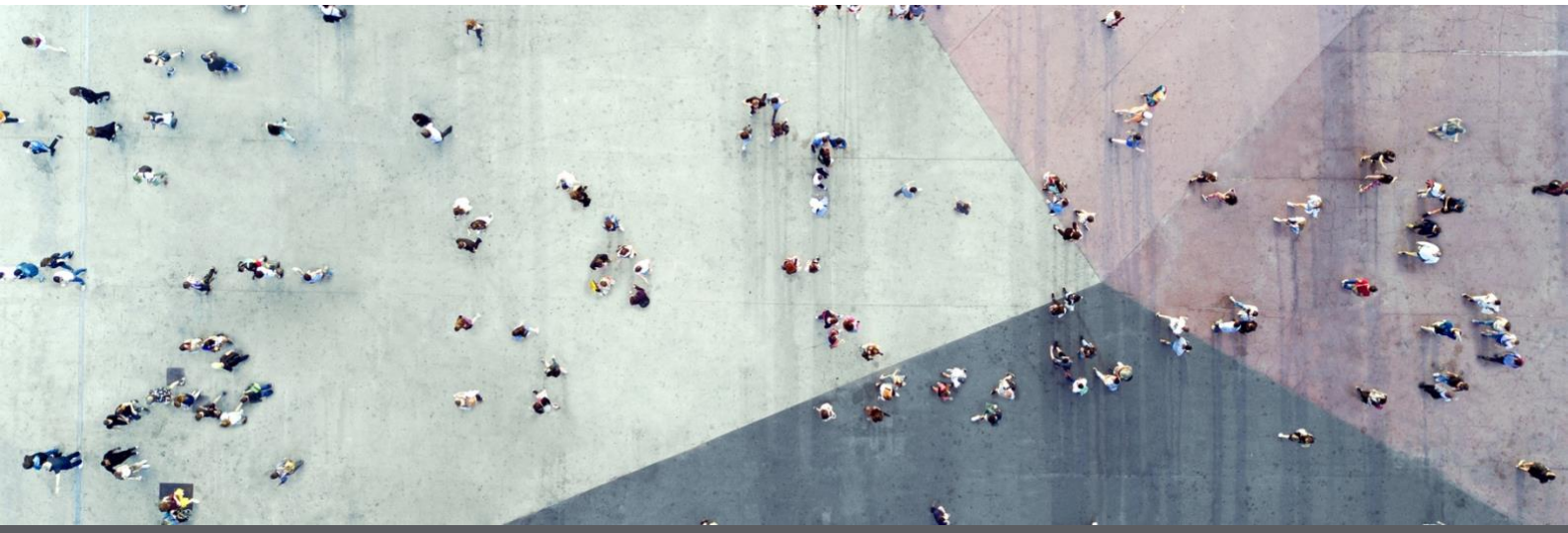

FIRA CONSORTIUM RESPONSE TO TRAI SPECTRUM CONSULTATION

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1 Executive Summary

The FiRa® Consortium appreciates the opportunity to submit their comments in response to the TRAI consultation. UWB was mentioned by several stakeholders (BIF, ICEA, NXP Semiconductors, AMCHAM, MAI) and FiRa would like to respond here.

FiRa is available to answer any questions related to this input.

2 The FiRa Consortium

The FiRa Consortium, whose name stands for “fine ranging,” 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.

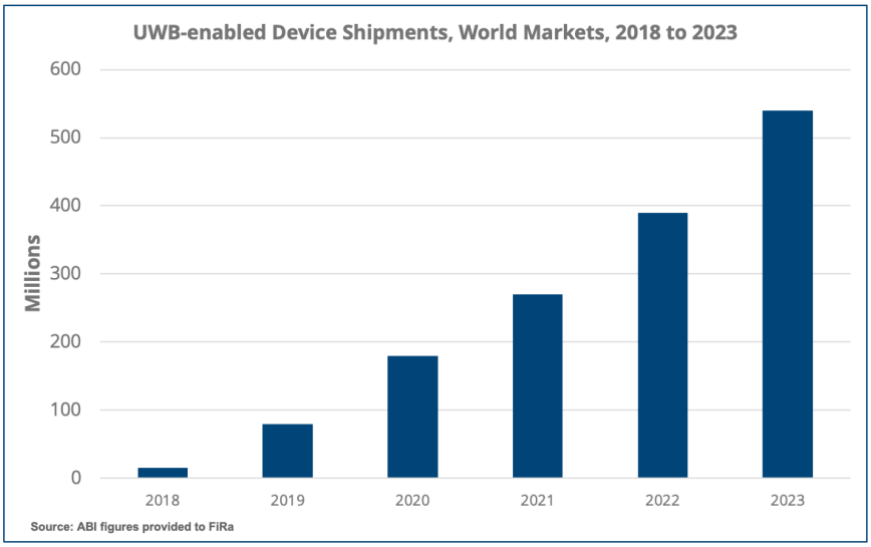
FiRa does this by driving the development of technical specifications and certification, advocating for effective regulations, and by defining a broad set of use cases for UWB with a broad membership base covering all relevant ecosystems.

3 Ultra-Wideband

After the first regulation for Ultra-Wideband (UWB) was developed in the mid-2000s, UWB technology was initially used in professional and industrial applications covering mainly closed environments. This changed significantly in 2019 with the introduction of UWB in consumer applications, such as automobiles and smartphones, and through the addition of the secured fine ranging feature (standardized in IEEE 802.15.4z). Since then, several smartphone manufacturers (Apple, Samsung, Google, Xiaomi, etc.) have integrated UWB into their devices, which has led to an exponential growth of UWB-enabled devices.

Similarly, car manufacturers are securing the passive entry systems with UWB since it provides protection against relay attacks and enhances user convenience.

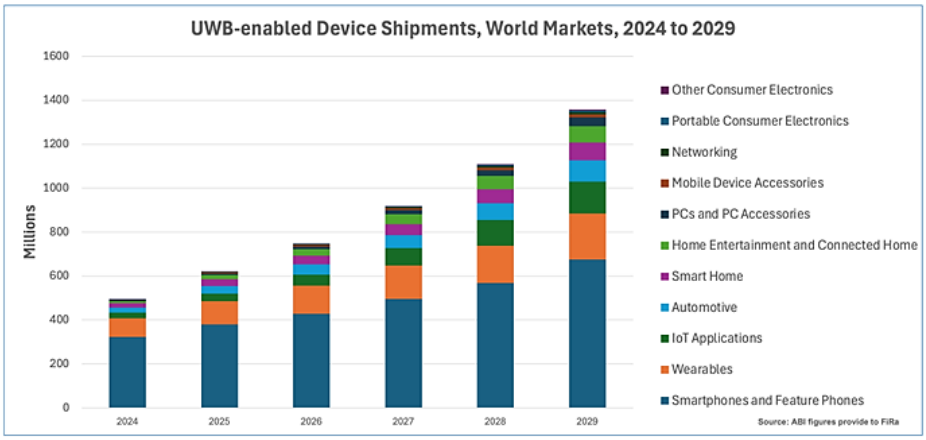
UWB technology provides secured fine ranging and positioning capabilities that enable precise location awareness for people and devices. This cannot be achieved with other technologies.
Since 2018, shipments of UWB-enabled devices have grown by 3600%.



The UWB ecosystem is growing rapidly and now allows a variety of new applications that require precise location determination and fine ranging. These include secure access control, precise vehicle positioning, the recovery of lost objects, and untracked navigation of people (RTLS) in crowded environments.

Industry consortia such as FiRa (end-user applications for location tracking) and others like Car Connectivity Consortium (CCC digital [car] key) or omlox (industrial applications of location tracking) were founded to address these location tracking UWB applications. Other organizations such as the Connectivity Standards Alliance (CSA) target to use UWB for access control (Aliro) next to their Matter standard.

Close to 1.4 billion devices are projected to be shipped annually by 2029.



UWB is also used in a variety of devices, e.g. for examining materials (wall tracking devices) or for motion detection and classification of objects as well as for tap-free mobile payment scenarios in automotive or retail environments.

In the automotive and private environment, other use cases are already being developed, such as UWB-based child presence detection, person behavior (detecting a falling person, heartbeat monitoring), burglary detection, and convenience functions such as a "kick sensor" for opening the trunk or light control through presence detection.

FiRa has identified a wide variety of use cases for UWB across four primary market segments: (1) Smart cities and mobility; (2) smart building and industrial;(3) smart retail; and (4) smart home and consumer. Initial areas of focus for FiRa include IoT, secure access, tracking, and indoor navigation. Some use cases, such as access control, RTLS, personal and consumer device tracking, and smart homes, drive personalized, position-aware automation and secure applications for the future automated society.

4 FiRa Response on WRC-27 Agenda Item 1.7

Q9. As the 7125-8400 MHz range in the 7 GHz band and the 14.8-15.35 GHz range in the 15 GHz band are being considered for IMT in WRC-27, whether there is a need to review the usage of 7 GHz and 15 GHz microwave backhaul bands at this stage itself, or should the review be undertaken after considering the outcome of WRC-27? Kindly provide a detailed response with justifications.

The most used channel currently, which can also be found in the various specifications, is UWB channel 9 (7 737.6 – 8 236.8 MHz) (i.e. IEEE 802.15.4). The potential identification of the frequency band 7 750-8 400 MHz, in region 1, for IMT poses a significant challenge that could impact existing and future deployment of UWB-based precise location determination and fine-ranging solutions.

Existing UWB use cases (e.g. trackers and digital car keys) should be take into consideration, supported by over one billion devices worldwide and growing, operating at 7.7 - 8.3 GHz (UWB Channel 9 in IEEE 802.15.4) based on UWB in 6 to 9 GHz, and consider future development and deployment of other UWB applications within the same band.

The FiRa Consortium recommendation is that the existing UWB use is taken into consideration and that any risk to the ongoing global mass deployment of UWB is avoided. After WRC-23 identified the 6 GHz band for IMT (AI1.2), the 7 750-8 400 MHz frequency range is essential for precise location determination and fine-ranging. The introduction of IMT in the frequency range 7 750-8 400 MHz would be disruptive for UWB applications.

FiRa's spectrum position and a summary of the potential IMT impact on the UWB operations can be found here:

- FiRa Consortium spectrum position statement
- FiRa Consortium interference study