

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of  
Improving Wireless 911 Caller Location  
Wireless E911 Location Accuracy Requirements  
Sixth Further Notice of Proposed Rulemaking

PS Docket No. 07-114

Comments of the  
  
**Ultra Wide Band (UWB) Alliance**  
  
to the  
  
**Federal Communications Commission**  
  
on

PS Docket No. 07-114

***About the UWB Alliance***

*The Ultra Wide Band (UWB) Alliance is a global not-for-profit organization that works to collectively establish ultra-wideband (UWB) technology as an open-standards industry. A coalition made up of vendors that either design, manufacture, or sell products that use ultra-wideband technology, the UWB Alliance aims to promote and protect the current allocation of bandwidth as well as promote the continuing globalization of the technology. As part of our mission, we advocate UWB technology and use cases to promote verticals showing the value of UWB for IoT and Industry 4.0 and to build a global ecosystem across the complete UWB value chain, from the silicon to the service. In addition, the Alliance is promoting and assuring interoperability through its work with Standards Development Organizations such as the IEEE and ETSI and then working with members to define upper layers and testing to assure compliance. For more information, please visit us at [www.UWBAlliance.org](http://www.UWBAlliance.org).*

# 1 Introduction and Summary

The UWB Alliance appreciates the Commission's initiative in soliciting feedback on the proposed rulemaking for Improving Wireless 911 Caller Location. Impulse Radio Ultra-Wideband (UWB) is an extremely low power radio technology capable of centimeter-level location accuracy, which can meet the vertical (z-axis) performance requirements in the FNPRM today.

UWB is integrated into virtually all mobile phones available today. It enables precise three-dimensional (3D) positioning. UWB infrastructure equipment is commercially available now, including enterprise-class Wi-Fi access points (APs) available now from vendors such as Cisco Systems<sup>1</sup>. UWB uniquely provides the vertical (z-axis) accuracy and position reliability needed to locate to the exact floor, the room, and even location within the room inside a building.

The UWB Alliance agrees that device-based hybrid (DBH) approaches are needed to meet the Commission's goals. UWB is a critical part of DBH solutions. Of the technologies presently available in mobile devices such as phones, UWB provides significantly greater precision position reliability.

## 2 Improving Location Accuracy

UWB solves the problems noted in the 6<sup>th</sup> FNPRM that are inherent in other, much higher power technologies, such as unreliable determination of the floor in a multi-floor building. Currently available UWB technology can greatly improve horizontal location accuracy as well. When combined with Wi-Fi and mobile data communications technologies, UWB serves as the precise location part of DBH solutions. With UWB, movement can be measured and reported in real-time.

The full capabilities of UWB for precise location can be achieved inside buildings under current FCC rules without the need to allocate additional dedicated spectrum.

UWB is a proven and reliable technology used globally in emergency scenarios, such as search and rescue operations, to locate individuals trapped in complex settings where other RF technologies fail due to multipath and signal interference. UWB has proven ability to coexist with other radio technologies, including those used by emergency services, without interference.

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<sup>1</sup> Cisco Wireless 9176 Series Access Points Data Sheet

<https://www.cisco.com/c/en/us/products/collateral/wireless/catalyst-9100ax-access-points/wireless-9176-series-acc-point-ds.html>

### 3 Availability of UWB

Standards-based UWB technology has been available in mobile phones and connected accessories beginning in 2016. Popular consumer applications include digital key access control for vehicles and buildings, locating and tracking items, and detecting occupants in vehicles. UWB is used in industrial settings for asset location and tracking, presence detection, tracking and navigation of automated vehicles in warehouses, and many other uses. UWB is used in sports for real-time tracking of players and balls. These uses demonstrate the high accuracy, reliability and dynamics provided with readily available commercial products.

Dedicated infrastructure devices compatible with the standards-based UWB in mobile phones are available from many vendors today to support high accuracy location and navigation. As noted, UWB is available in enterprise access points now, with the expectation that more enterprise vendors will follow. We expect this to ‘trickle down’ into consumer devices in the near future.

The available products can be used in cost-effective systems that meet the performance goals the Commission proposes now.

### 4 Use of UWB outdoors

Operation of UWB devices under current FCC rules provides peer-to-peer ranging and relative location determination between user handheld devices. When combined with a known geolocation of a peer device, base station or access point, the location of all participating peers can be determined. Combined with Wi-Fi technology, for example, information can be exchanged between peer devices to support the ‘crowdsourced’ approach described in the FNPRM. Such solutions enhance outdoor position determination by improving accuracy significantly over GPS, cellular, Bluetooth, or Wi-Fi-based positioning, with real-time movement tracking.

With modification of the prohibition on fixed outdoor infrastructure in the UWB rules, absolute position accuracy can be significantly better than GPS and can work where GPS is unavailable or performance is compromised due to sky obscuration, such as in the urban canyons common in dense urban areas. UWB in fixed devices in such situations will greatly enhance the accuracy and reliability of position determination for E911. Risk of interference is mitigated by the extremely low transmit power used and can be further mitigated with restrictions on the height of fixed devices to below the height of surrounding buildings or terrain.

We encourage the Commission to consider modification of the prohibition on fixed outdoor infrastructure in Part 15 subpart F to enable use of UWB to extend the benefits of UWB to E911 location accuracy where needed outdoors.

## 5 Conclusion

We again thank the Commission for the opportunity to comment on the 6<sup>th</sup> Further Notice of Proposed Rulemaking. We believe the performance targets the Commission seeks are attainable today, with commercially available, cost-effective UWB technology. We encourage the Commission to consider the value UWB provides for 3D position accuracy for E911 caller location solutions. We believe UWB is a critical technology for meeting the Commission's goals.

Respectfully Submitted,

Tim Harrington, Chairman

Ultra Wide Band Alliance