Fira | The Power to Be Precise

Annual Report

2020

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2020 – UWB Unleashed

Ultra-Wideband (UWB) technology, with its superior positioning and sensing capabilities, is poised to transform connectivity experiences across all aspects of life. FiRa™ will be the catalyst for that transformation!

FiRa members share a common vision of developing an open and interoperable ecosystem for UWB. Despite the challenges of working during a global pandemic, our members have demonstrated incredible collaboration and resilience to propel us forward.

Through the efforts of our Working Groups, FiRa has achieved several milestones:

- Increasing membership to include 60+ industry-leaders across multiple market segments;

- Identifying use cases where UWB technology has a positive impact on user experience;

- Developing technical specifications and a certification program; and

- Educating the market about UWB technology and its uses.

As a member-driven organization, we look to industry to join FiRa and participate in our Working Groups, helping us to reach our full potential and realize our vision of seamless connectivity experiences through UWB innovation.

Charlie Zhang, Board Chair
Senior Vice President, Engineering, Samsung Research Americas

Our Vision

Our vision is to provide seamless user experiences using secured fine ranging and positioning capabilities of interoperable **UWB technologies.**

Our Mission

DEVELOP UWB ECOSYSTEMS

Develop use cases based on IEEE 802.15.4 UWB ranging technologies

Develop specifications and certification program to ensure interoperability among chipsets, devices and solutions

Promote UWB ecosystems and enable new business opportunities delivering elevated user experiences

Establish FiRa Consortium as the reliable and trusted UWB brand that is adopted by the ecosystems

"The very important role of FiRa is to define standards for the interoperability of UWB. This is necessary to support a wide range of use cases and to enable a seamless experience for all consumers around the world."

Tobias Goldschalt, Board Member
Senior Connectivity Architect, Bosch

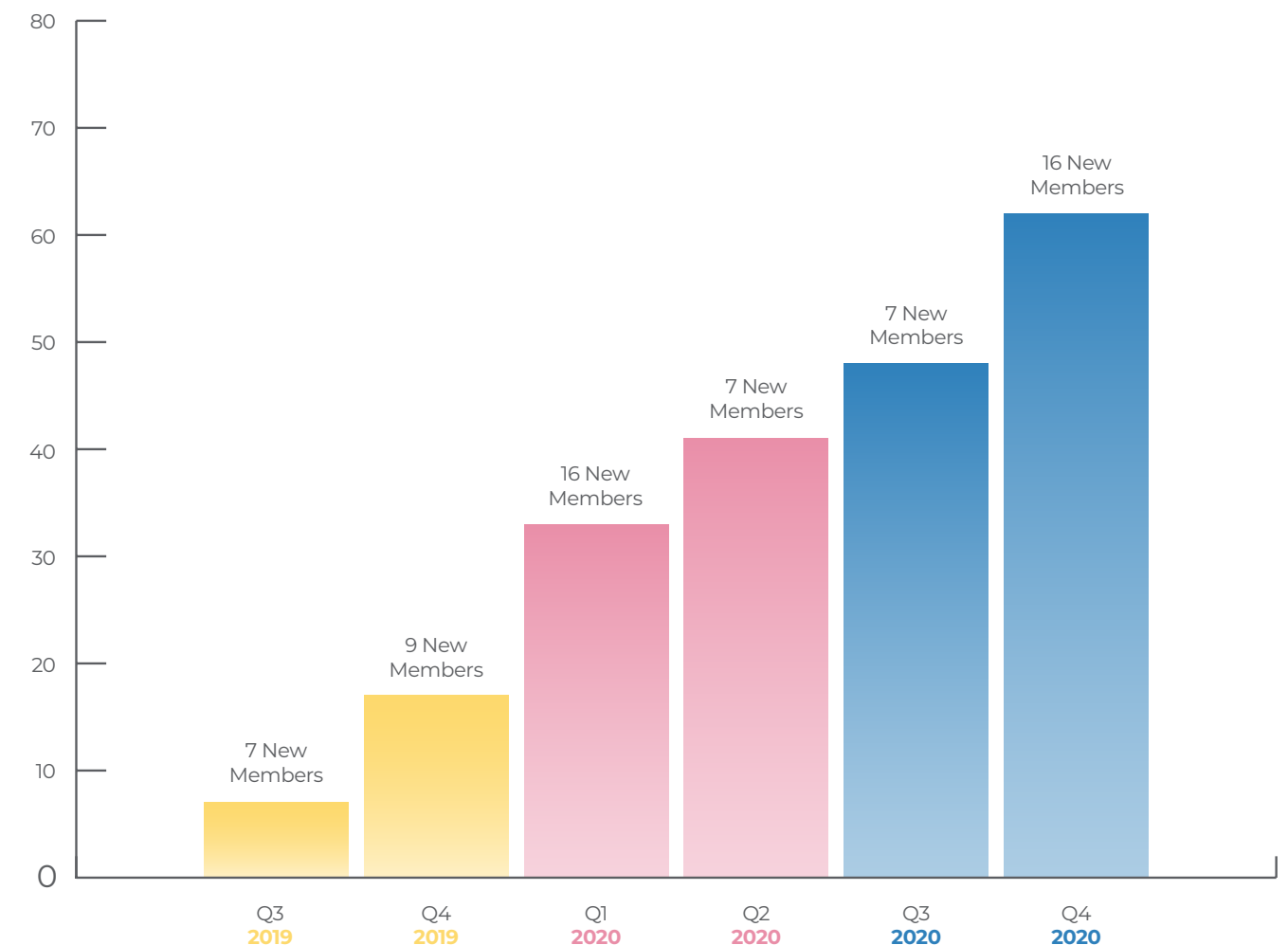# FiRa - Quickly Becoming Front and Center in the UWB Landscape

"UWB holds enormous potential to shape new and exciting user experiences with innovations that can be applied across Automotive, IoT, Mobile, Wearables and Networking products. FiRa, supported by extensive member companies' expertise, is well positioned to accelerate standardization, certification and adoption of UWB capabilities."

Shishir Gupta, Board Member
Director, Product Management, Qualcomm Technologies, Inc.

FiRa Consortium Experiences Rapid Membership Growth

FiRa proved to be a catalyst for bringing leading innovators together to drive UWB expansion forward. Having more than tripled in size in 2020, the Consortium now has **60+ members** across its six membership levels.

7 New Members	9 New Members	16 New Members	7 New Members	7 New Members	16 New Members
Q3 **2019**	Q4 **2019**	Q1 **2020**	Q2 **2020**	Q3 **2020**	Q4 **2020**

FiRa Members are Industry Leaders

Sponsor Members

Aside from being long-time leaders in technology and innovation, our Sponsor members understand the vital importance of interoperability when it comes to establishing a new approach, and recognize the need for a strong, sustainable ecosystem to support emerging applications.

ALLEGION PIONEERING SAFETY

BOSCH Invented for life

HID

NXP

QORVO

Qualcomm

SAMSUNG

THALES

Contributor Members

Contributor members bring significant technical and market knowledge to the creation of technical specifications that result in an interoperable UWB ecosystem.

CISCO

Redpoint See the moving world

SONY

ST

TSINGOAL 清研讯科

MI 小米

Associate Members

Associate members share their expertise and have the opportunity to grow the ecosystem by enabling products with UWB technology.

BlueCats

COMARCH

DENSO

dormakaba

f

Huf

HUMATICS

Hyundai

LITEPOINT A Teradyne Company

MinebeaMitsumi Passion to Create Value through Difference

tile

浩云科技 HAOYUN Technologies

Adopter Members

Adopter members help to expand the UWB ecosystem by integrating UWB technology meeting agreed-to specifications into products.

CEVA

精位科技

CXSEMI

Cleverciti

COMPRION

DEVERITEC

DONN

EHIGH 恒高

gp GEOPLAN

GIANTECH

ESAT

kunchen 中电民展

LEGIC

Locaris 联睿电子

MKSEMI NEW RADIO TECH

纽瑞芯科技 NEW RADIO TECH

OPPO

SUNWAY COMMUNICATION

SynchronicIT

UBITRAQ

UNIKEY

wipelot

沃旭通讯 WOXU WIRELESS

Test Lab Members

Test lab members ensure that UWB-enabled products and solutions meet the standards set by the FiRa Consortium.

CAICT 中国信通院

Dt&C

HCT HCT CO.,LTD.

NPP ITELMA

SGS

同维实验室

TTA

Academic and Educational Members

Academic and educational members are able to bring their academic knowledge and expertise to the FiRa Consortium, helping to ensure that we are leveraging some of the world's best resources in the development of UWB technology.

Carnegie Mellon University

UNIVERSITEIT GENT

HTW HOCHSCHULE FÜR TECHNIK UND WIRTSCHAFT DRESDEN UNIVERSITY OF APPLIED SCIENCES

Yale University

UWB – A New Door Opener of Possibilities

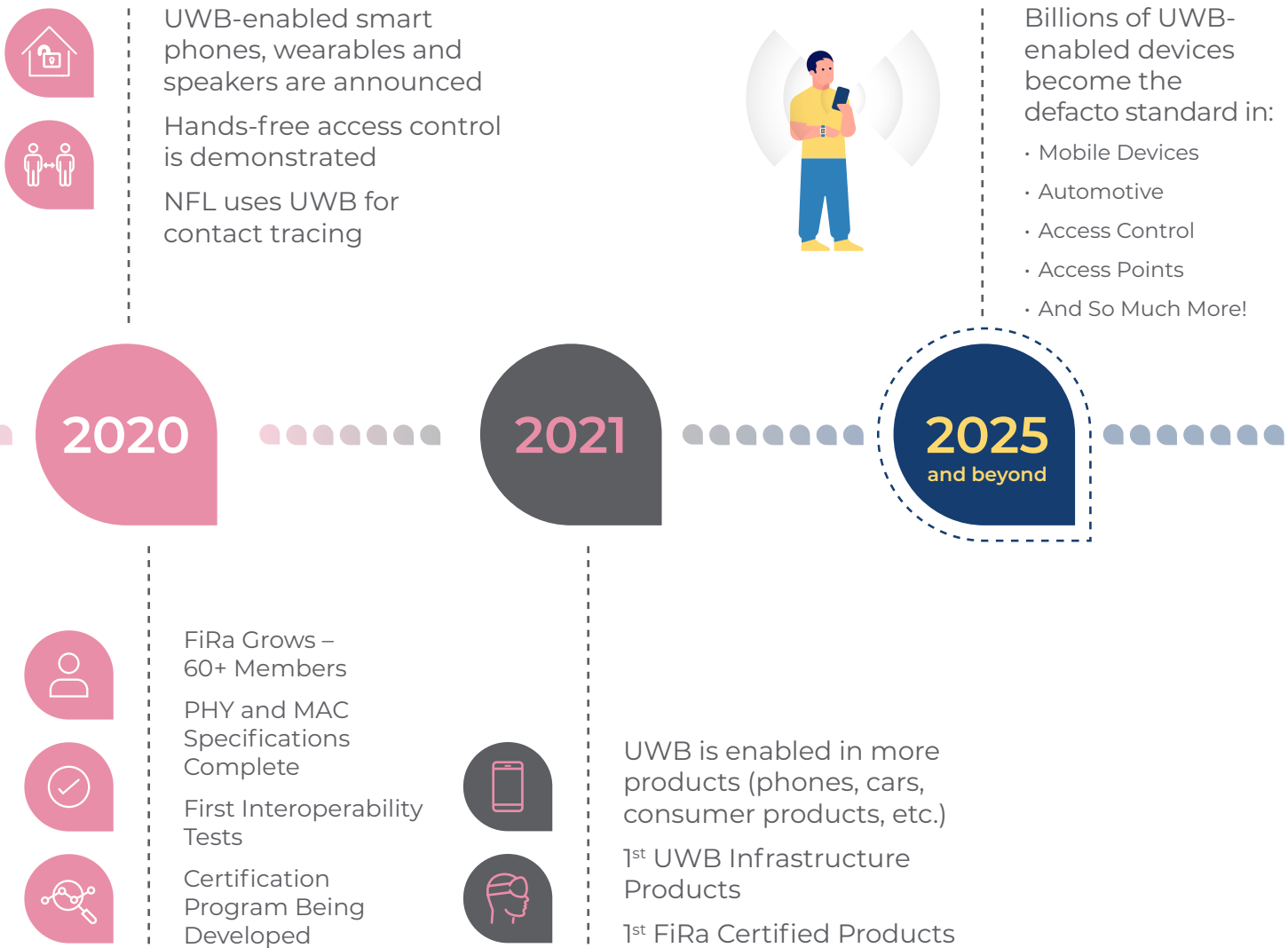# UWB – It Is Happening Now

All ingredients for UWB to become the next major wireless technology are coming into focus:

✓ **UWB technology is being adopted in Automotive, Industrial, Consumer and Infrastructure**

✓ **A rich ecosystem from technology providers to OEMs is being built**

✓ **FiRa is pulling it all together to drive interoperability**
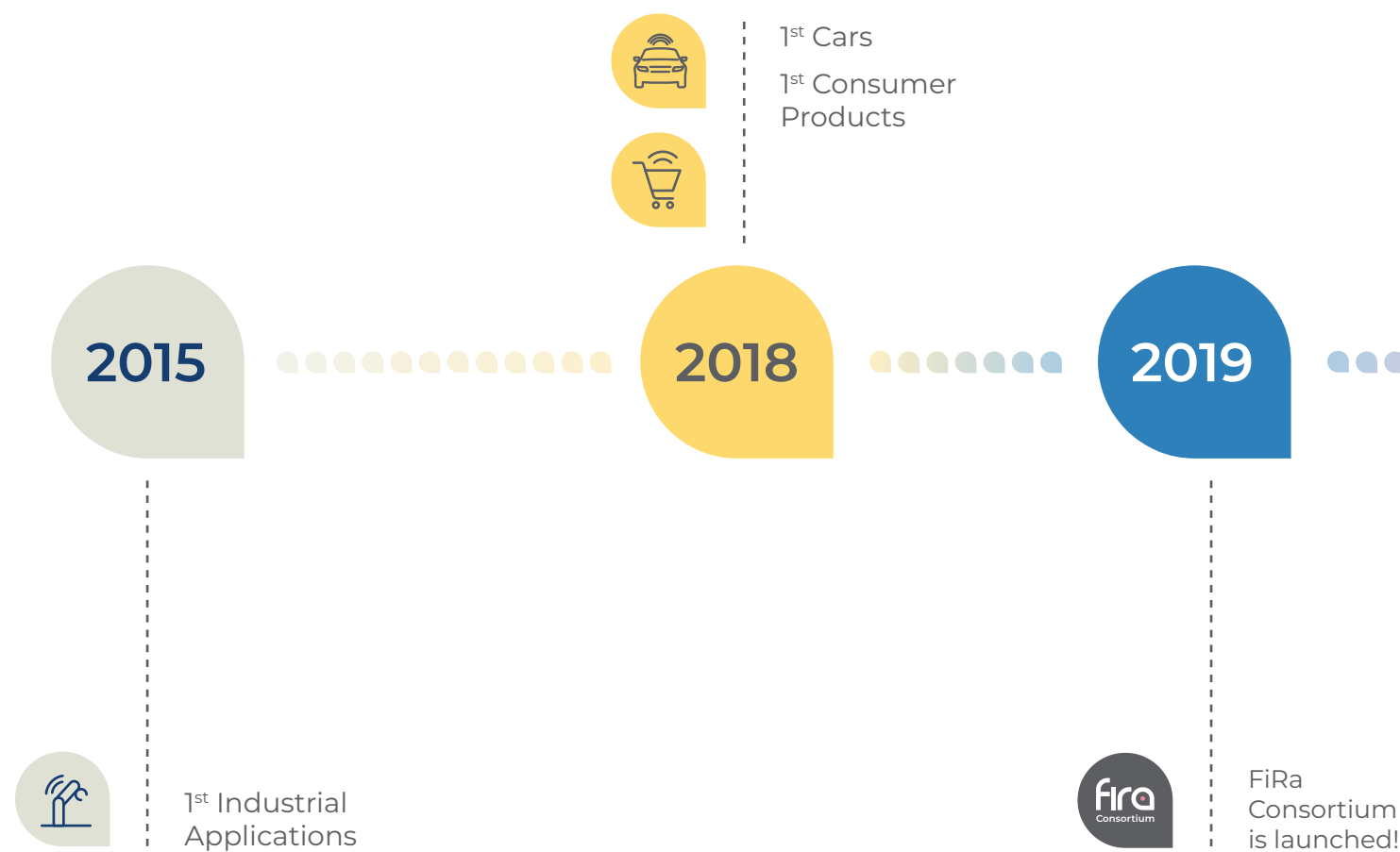
> *"As interest in UWB grows, the FiRa Consortium is becoming an undisputed stepping-stone for new UWB-based activity, promotion and deployment. FiRa members are harnessing the potential of this technology, which will result in commercial deployments across a variety of industries and use cases."*

Fabien Courtiade, Board Member
OEM Key Partners Director, Thales

2015
1st Industrial Applications

2018
1st Cars
1st Consumer Products

2019
FiRa Consortium is launched!

2020
UWB-enabled smart phones, wearables and speakers are announced

Hands-free access control is demonstrated

NFL uses UWB for contact tracing

FiRa Grows – 60+ Members

PHY and MAC Specifications Complete

First Interoperability Tests

Certification Program Being Developed

2021
UWB is enabled in more products (phones, cars, consumer products, etc.)

1st UWB Infrastructure Products

1st FiRa Certified Products

2025
and beyond
Billions of UWB-enabled devices become the defacto standard in:
· Mobile Devices
· Automotive
· Access Control
· Access Points
· And So Much More!

A Network Effect
Accelerates the Adoption

A Network Effect takes place when an increased number of participants accelerates the value of a product or service resulting in the attraction of even more participants.

Today, this is exactly what is happening with UWB technology. The start of a Network Effect is leading to rapid adoption of the technology! More and more companies are designing products and services interconnecting Automotive, Industrial, Consumer and Infrastructure.

This enables cross-market fertilization and generates added value to members of the ecosystem including consumers, device manufacturers and technology providers.

As users become accustomed to the convenience and security of UWB, they will generate more demand for the technology.

And the UWB Network Effect is born!

"Over the past years, UWB technology has demonstrated its value in numerous applications across Automotive, Industrial Consumer and Infrastructure markets. With the recent adoption of UWB technology in mobile phones and joint efforts from industry towards standardization driven by FiRa, UWB is now putting its steps into similar tracks as its famous WiFi and Bluetooth predecessors and is about to become the next ubiquitous connectivity technology."

Luc Darmon, Board Member
Director Secure Transactions, Qorvo

UWB Transforms Connectivity Experiences

Ticket validation
(Public transport services)

Indoor navigation

Asset tracking

Social distancing

Unmanned store access

Tap-free mobile payment

Point and trigger controller app

Residential access control
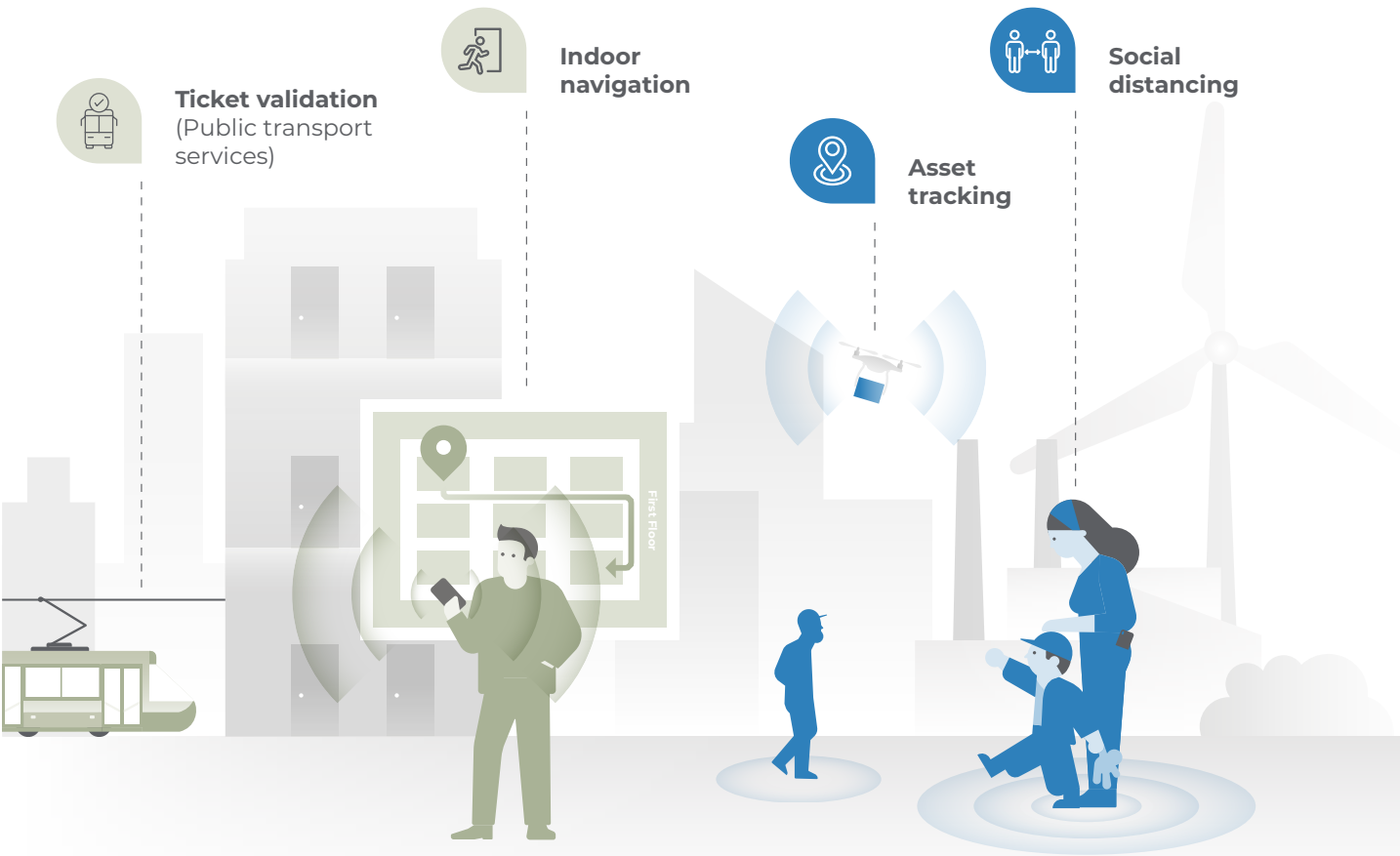
SMART CITIES AND MOBILITY

Parking garage access control

Vehicle digital key (Standardized by CCC)

Rider identification (Private transport services)

Bike sharing (Find a bike nearby)

Ride sharing (Precise positioning)

Driverless valet parking and pick-up

V2X* and autonomous driving

Reserved seat validation

Transportation fare payment

eID validation in crowded environments

SMART BUILDING AND INDUSTRIAL

Physical access control

Employee indoor navigation

Employee mustering in emergencies

Find equipment

Patient tracking

Teleconference system

Proximity-based patient data sharing

Logical access control

SMART RETAIL

Foot traffic and shopping behavior analytics

Exhibition attendee management

Targeted marketing

Drone-controlled delivery

In-vehicle payment

SMART HOME AND CONSUMER

Logical access to personal devices

AR gaming

Gesture-based control

VR gaming and group play

Find someone/ something nearby

Presence-based device activation

*Connected Vehicle-to-Everything Communication

Use cases across all verticals

Compelling new experiences, combined with the development of an open and interoperable ecosystem, is driving the widespread adoption of UWB across multiple markets and applications.

Access control has a catalyst role

The FiRa Consortium believes that access control will serve as a catalyst for other UWB use cases. Therefore, residential and industrial access control were the first to be specified.

What's next?

Based on a comprehensive member survey, today's FiRa members selected indoor navigation, asset/equipment tracking, mobile payment, social distancing, and point and trigger controller apps to be among the first applications to market, thus making the specification of those a priority in the FiRa Consortium's standardization work.

"FiRa's Requirements Working Group identified more than 35 relevant UWB use cases, and more will follow. UWB will proliferate across phones, cars, IoT sensors, devices and objects of all form factors, with mobile likely to be the seeding platform for new UWB use cases to evolve."

Charles Dachs, Board Vice-Chair

Vice President and General Manager for Secure Embedded Transactions, NXP Semiconductors

FiRa Consortium Milestones

Specifications:

APRIL 2020

Published PHY Requirements Specification defining RF PHY communication to ensure interoperability between FiRa Consortium Certified Ultra-Wideband (UWB) enabled devices

MAY 2020

Published MAC Requirements Specification defining MAC layer UWB ranging protocols and behavior of the ranging devices

OCT. 2020

Published FiRa USB VCOM Technical Requirements Version 1.0

NOV. 2020

New version of UWB MAC Technical Requirements Version 1.1 & UWB PHY Technical Requirements Version 1.1 available

"Achievement of these milestones sets a strong foundation for FiRa to further the development of an open and interoperable ecosystem based on the use of fine-ranging UWB technology."

Clint Chaplin, Secretary

Senior Principal Standards Engineer, Samsung Research America

Interoperability Test Events:

MAY 2020

3 independent FiRa member implementations successfully achieved interoperability against PHY interop test specification

AUG. 2020

3 independent FiRa member implementations successfully achieved interoperability in measuring distance over-the-air

NOV. 2020

2 FiRa member implementations were tested against PHY Conformance Test Tool Certification

Certification Program Progress:

✓ **Nearing completion of FiRa PHY Conformance Test Specifications**

✓ **Nearing completion of FiRa MAC Conformance Test Specifications**

✓ **Nearing completion of PHY Conformance Test Tool validation against PHY Conformance Test Specifications**

✓ **Nearing completion of MAC Test Tool development**

Learn More

Help shape the future of UWB technology

FiRa Consortium Provides Market Education

The FiRa Consortium placed emphasis on developing and sharing information to educate the market on various aspects of UWB technology.


Fraunhofer Institute
ID:SMART Workshop

Security Industry Association Webinar:
"Ultra-Wideband (UWB) Explained and Why It's an Exceptional Connectivity Experience"
>> *https://www.securityindustry.org/webinar/ultra-wideband-uwb-explained-and-why-its-an-exceptional-connectivity-experience/*

Security Industry Association Whitepaper:
"Applying Ultra-Wideband Wireless Technology for Security and Automation"
>> *https://www.securityindustry.org/2020/11/17/applying-ultra-wideband-wireless-technology-for-security-and-automation/*
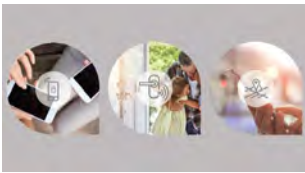
SecurityInformed.com Whitepaper:
"Secure, Pinpoint Location with UWB-Enabled Indoor Positioning"
>> *https://www.securityinformed.com/insights/secure-pinpoint-location-uwb-enabled-indoor.1601456965.html*

Whitepaper
"Introduction to Impulse Radio UWB Seamless Access Systems"
>> *https://www.firaconsortium.org/sites/default/files/2020-10/introduction-to-impulse-radio-uwb-seamless-access-systems-102820.pdf*

Wikipedia page established on **FiRa Consortium**
>> *https://en.wikipedia.org/wiki/FiRa Consortiumsystems-102820.pdf*

Technical FAQs published
>> *https://www.firaconsortium.org/discover/technical-faq*

"FiRa members developed numerous assets to further the awareness of UWB and establish the consortium as a trusted steward across multiple industries. It's about advancing the collective goal of interoperability and thus an ultimate consumer experience."

Mark Lynn, Board Member
VP, Engineering - Americas, Allegion

FiRa Member Companies...

Have an opportunity to:

- Influence industry trends around the use of UWB technology for a variety of applications

- Be actively involved in defining UWB technology standards

- Enable products / solutions with UWB technology via early access to technical details

- Certify products as interoperable, providing customers with confidence in their choice of products and/or solutions

- Exhibit thought leadership in the expansion of the UWB ecosystem

- Participate in a variety of marketing related activities, helping to promote your company

- Develop new sources of revenue from the sale of FiRa Consortium certified UWB technology enabled products

Joining is Easy!

1. Choose the membership level that is right for your organization

2. Review the FiRa Governing Documents

3. Complete and submit the Membership Application

4. Get involved! Join and actively participate in the Working Groups

Details are on the FiRa website at: https://www.firaconsortium.org/membership

"As interest in UWB grows, the FiRa Consortium is becoming an undisputed stepping-stone for new UWB-based activity, promotion and deployment. FiRa members are harnessing the potential of this technology, which will result in commercial deployments across a variety of industries and use cases."

Ramesh Songukrishnasamy, Director and Treasurer
Senior VP and CTO, HID Global

About FiRa Consortium

Headquartered in Beaverton, OR, the FiRa Consortium is a member-driven organization dedicated to the development and widespread adoption of seamless user experiences using the secured fine ranging and positioning capabilities of Ultra-Wideband (UWB) technologies. To learn more about the FiRa Consortium, visit **www.firaconsortium.org**.

January 2021