MARKET RESEARCH NOTE

When connection becomes inclusion: How Bluetooth® is redefining accessibility

Bluetooth®

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Executive summary

Thanks to its inherent characteristics, continued innovation, and input from a diverse member ecosystem, Bluetooth® technology continues to unlock new possibilities for individuals, communities, businesses, and industries around the globe. The evolution of Bluetooth® technology continues to enable new applications and use cases, helping to create a connected world that is more convenient, more healthy, more productive, and more sustainable.

Alongside this, the Bluetooth community is committed to making the world a more accessible place, removing barriers and enriching lives through greater independence, participation, and belonging, assisting people of all abilities to move more freely and engage more confidently. From enabling smart wheelchairs and fall-detection wearables to screen readers and smart glasses, Bluetooth® accessibility solutions are empowering individuals with visual, mobility, and speech accessibility challenges to better navigate everyday life. For hearing, Bluetooth® LE Audio and Auracast™ broadcast audio are redefining what's possible in hearing assistance, making it easier for people to connect with each other, our communities, and the world.

This paper looks at how Bluetooth® technology is supporting people with varying accessibility needs to enable a more accessible world. In particular, it highlights the diversity of Bluetooth® assistive products that can aid those faced with visual, mobility, speech, hearing, and other accessibility challenges. It also explains why Bluetooth® technology is uniquely positioned to support accessibility and serves as a call to action to encourage more product manufacturers to create new assistive products which can enable a better future for all.

Table of Contents

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As senior research director for ABI Research's Strategic Technologies team, Andrew conducts research into the rapidly changing wireless connectivity market, with an emphasis on market forecasts and qualitative insight covering Bluetooth technology, Wi-Fi, 802.15.4, near-field communications (NFC), HaLow, WiGig, and other emerging wireless standards and protocols. Andrew also writes reports on the technological evolution and long-term prospects for wireless connectivity technologies, particularly as they increasingly target new verticals across the Internet of Things (IoT).

Introduction

Around the globe, billions of people are affected by a range of visual, mobility, speech, and hearing challenges that have the potential to significantly impact their quality of life. The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) defines a person with a disability as having a "long-term physical, mental, intellectual or sensory impairment which, in interaction with various barriers, may hinder the full and effective participation of disabled people in society on an equal basis with others."

2.5B

people need one or more assistive products to maintain or improve functioning and independence

Source: World Health Organization (WHO)

This definition encompasses a wide range of challenges, including visual (e.g., low vision or blindness), hearing (e.g., deafness, mild or moderate hearing loss), mobility (e.g., loss of limbs, spinal cord injuries, musculoskeletal injuries, arthritis, multiple sclerosis, or muscular dystrophy), speech (e.g., speech sound disorders or voice disorders), and a range of cognitive, neurological, and learning disabilities.

According to the World Health Organization (WHO), more than 2.5 billion people need one or more assistive products that can maintain or improve an individual's functioning and independence. By 2050, this is anticipated to rise to 3.5 billion. This projected increase is due to a combination of an ageing global population, a rise in chronic health conditions, and sporadic health emergencies originating from disease outbreaks, conflicts, natural disasters, and climate change. The WHO estimates that as early as 2030, one in six people in the world will be aged 60 years or over.

With this in mind, making the world more accessible through the availability of new assistive technologies and products will be fundamental to future global prosperity at both the individual and societal level. Assistive technology and products bring life-changing benefits for individuals thanks to their ability to enable greater independence, participation, and inclusion, enhancing access to and improving prospects within education, employment, sports and leisure, as well as day-to-day activities. Furthermore, these products can also enable enormous socioeconomic benefits such as enabling more people to participate in the labor market, enhancing productivity and employee wellbeing, reducing the burden on caregivers, improving mental health, and delaying the need for long term care, as well as reprioritizing healthcare and welfare spending to those most in need.

Thanks to its diverse member ecosystem, ubiquitous presence in mobile and computing devices, low-power consumption, audio capabilities, dedicated accessibility features, and continued technological innovation, Bluetooth® technology is uniquely capable of enabling an extensive range of assistive products, facilitating greater visual, mobility, speech, and hearing accessibility around the world.

Visual accessibility

According to the WHO, at least 2.2 billion people have some form of visual impairment. For many years, Bluetooth® technology has helped those impacted experience the world with more confidence and independence thanks to the availability of a wide range of visual accessibility assistive products, such as reading-assistance devices, large-print accessibility keyboards, and text-to-voice products. Meanwhile, new product categories, such as smart glasses, have the potential to bring benefits to users faced with different types of accessibility challenges.

Bluetooth® screen readers

The ability to pair a range of accessibility devices with Bluetooth® speakers, headphones, or hearing aids means that people with low vision, reading difficulties, and reading fatigue can all benefit from dedicated personal reader devices that can convert text into audio. Devices like the OrCam Read and the OrCam MyEye Pro series of reading devices are equipped with Bluetooth® technology to enable discreet readouts directly to the ear or can be paired with speakers when at home.

2.2B

people have some form of visual impairment

Source: World Health Organization (WHO)

Bluetooth® braille displays

Bluetooth® braille displays enable users to read text, documents, and additional information from PCs, smartphones, tablets, and other screen-reader-capable devices. Furthermore, more advanced multi-line braille displays and graphics displays can enable braille users to access any form of graphical information, such as charts, drawings, flowcharts, floor plans, topographical maps, images, and photographs, among other visuals. Many of these displays can also be used as an input device or as a notetaker thanks to braille keypads or cursor pads for navigational abilities.

Bluetooth® technology is also being utilized in a range of accessibility keyboards that are equipped with larger, high-contrast keys beneficial to users faced with visual accessibility challenges. Importantly, starting in Android 15, Google added support for braille displays via HID, enabling any Android 15 or later smartphone or tablet to connect via Bluetooth® technology to these devices more seamlessly.

Bluetooth® wearable navigation devices

Several companies have created a range of mobility and navigation devices to assist those confronting visual accessibility challenges in different environments. While some of these are in the startup phase, they demonstrate the long-term potential of new form factors that combine camera technology with machine learning to guide users across different environments or have their surroundings or objects described to them in real time. Typical products include wearable headsets, walking sticks and canes, smart belts, and other devices that can detect obstacles, provide descriptions of the environment, and direct users to their destination via haptics or audio. These leverage Bluetooth® technology to connect to a smartphone for traditional audio functionality such as taking calls, using a voice assistant, or listening to music, as well for enabling discreet audio direction readouts. In addition, these devices can connect to companion apps for setup, onboarding, configuration, and over-the-air (OTA) updates, alongside enabling the use of smartphone navigation applications.

Of course, users faced with visual accessibility challenges can also benefit from voice directions on smartphones. These have a range of accessibility features that benefit from direct connectivity to Bluetooth® headsets for discreet readouts. Meanwhile, new AI assistant form factors are in development by many OEMs and may offer new accessibility-centric possibilities thanks to in-built cameras and support for Bluetooth® audio.

53M

Bluetooth® smart glasses will ship annually by 2030

Source: World Health Organization (WHO)

Bluetooth® smart glasses

Smart glasses have tremendous potential to help address multiple accessibility challenges. These devices are becoming increasingly specialized, and a range of form factors, including monocular, binocular, and no-display, each with their own unique set of features, are targeting accessibility related applications. By 2030, Bluetooth® enabled smart glasses are forecasted to reach over 53 million annual shipments.

Some smart glasses, such as the ViXion01 and ViXion01S, feature innovative autofocus technology, automatically adjusting the focus to improve near and far vision for users, improving sight and reducing eye strain and fatigue when reading, sewing, or engaging in other activities that require different types of focus. These solutions come equipped with Bluetooth® technology to enable remote configuration and control from a companion app, alongside enabling OTA updates while minimizing the impact on battery life.

Products like the eSight Go from Gentex are smart glasses equipped with a camera that can enhance footage and display it on two HD OLED screens to provide a clearer image to the end user. The solution leverages Bluetooth® connectivity to pair with a dedicated remote controller as well as a mobile app that can help adjust the user experience and parameters such as zoom, contrast, filters, volume, and tilt, among other settings.

Devices such as the OrCam MyEye Smart and Pro are smart-magnifier and AI-assistant devices that magnetically attach to the side of existing glasses, enabling users to receive text to speech via an in-built mini speaker or directly into Bluetooth® headphones.

Smart glasses also bring benefits for those confronted with hearing accessibility challenges. For example, several devices have emerged that enable real-time captioning of conversations. These leverage in-built microphones to listen to the user's conversation, transcribe it on a smartphone via Bluetooth® technology, and then present it on the smart glasses display. These can take advantage of smartphone apps by pairing via Bluetooth® connectivity, enabling users to adjust font size and appearance, set preferred languages, review past conversations, and modify microphone sensitivity. Meanwhile, the low-power characteristics of Bluetooth® technology can enable extended battery lifespans for these size constrained devices.

Mobility accessibility

Bluetooth® technology is also transforming how people faced with mobility challenges can interact with the world around them, enabling individuals to move more freely, participate in a range of work and leisure activities, communicate more effectively with family and friends, and live more independently. This includes a range of assistive human-interface devices (HIDs), mobility aids, prosthetics, and bionic devices.

Bluetooth® enabled wheelchair control systems

Many wheelchairs and wheelchair control systems are equipped with Bluetooth® technology, enabling users to leverage a joystick or alternative control system to operate smartphones, PCs, and tablets wirelessly to make phone calls, write documents, send emails, control smart home devices, and complete other daily activities. Devices like the Permobil Joystick Module enable users to live more independently, communicate more effectively, and experience a much higher quality of life by allowing them to rely less on caregivers and experience greater participation in a wide range of activities.

Assistive switches

There are a range of Bluetooth® enabled assistive switch devices and hubs that allow users to control their devices wirelessly. These use Bluetooth® connectivity to connect with computing devices to enable users with limited movement to directly interact with them.

Game controllers

The Xbox Adaptive Controller is a hub device with large programmable buttons and input ports that enables users to connect a range of devices, including switches, buttons, joysticks, and mounts, to create their own custom controller tailored to their abilities. This hub supports Bluetooth® technology for wireless connectivity to an Xbox console or PC.

Wearables and electromyography (EMG) devices

Innovative smart-mouthwear solutions can allow users to control their smart devices by converting subtle tongue and head gestures into cursor control and clicks. Sip and puff gestures can be used to enable control commands such as left and right click, click-and-drag, and scrolling. These solutions are equipped with Bluetooth® technology to connect directly with mobile devices and PCs. Despite the small form factors, these devices can offer several hours of continuous use, and the wireless ability enables more flexible and comfortable interactions with a range of devices.

In recent years, there have been a number of innovations in technologies, such as electromyography (EMG), that help those suffering from paralysis and loss of speech to control devices via wearable sensors that can convert movement signals into inputs. Some Bluetooth® enabled medical-grade wireless sensors can be placed

on the skin over a muscle. When the user attempts to move that muscle, the sensor interprets the EMG signals sent from the brain to the muscle and translates this into a control input. This allows users to leverage the device as a keyboard when connected to a smartphone or PC, enabling them to send and receive messages and emails and browse the internet, among other benefits.

Other wearable wristbands utilize surface nerve conduction sensors to enable various commands via gestures and fingertip pressure sensing. This allows any compatible Bluetooth® device to be controlled wirelessly, bringing benefits to those with limited dexterity or other mobility accessibility challenges. Other companies like Meta have also developed their own EMG Neural Wristband for use within AR and VR environments, making them more inclusive to users with a range of abilities.

Bluetooth® mobility aids

A further way in which Bluetooth® can enable greater mobility accessibility is through a range of aids including prosthetics, bionics, and exoskeletons, among other emerging device types. These devices are often equipped with Bluetooth® technology to provide connectivity with companion apps, enable firmware updates, support remote configuration and control, and for diagnostics.

One example is an exoskeleton designed for a range of activities including walking, hiking, cycling, climbing stairs, and running, among others. The device claims that it can reduce physical exertion by 30 percent and offset up to 30 kg of weight, enabling users to carry out their activity for longer, carry more weight, or reduce fatigue for daily activities. These types of exoskeletons could enable the elderly or people with limited mobility to be more active and participate in a wider range of activities with family or friends. With embedded Bluetooth® technology, the exoskeleton can connect with a mobile app to optimize its parameters, such as power and sensitivity, configure modes, track activities, and upgrade the firmware.

Companies like Open Bionics offer a range of bionic devices including the Hero PRO, a bionic arm capable of lifting up to 57lbs that can switch between grip modes to complete daily tasks such as grabbing a cup of coffee, typing on a keyboard, carrying groceries, tying shoelaces, or using a mobile phone. The device can be paired with a smartphone via Bluetooth® connectivity to take advantage of the Sidekick App, enabling remote configuration of LED brightness, vibration power, battery status, track activities, enable firmware updates, and complete training and interactive challenges. Similarly, Ottobock offers a range of prosthetic limbs with embedded Bluetooth® technology, alongside a companion app to enable users to access a wealth of information via their smartphone, including battery status, volume, activity tracking, and better tailor the device to their needs.

Speech accessibility

According to the National Institutes of Health, approximately 10 percent of the U.S. adult population has a speech, language, and/or voice impairment. These can lead to negative impacts in terms of independence, social interactions, academic performance, employment prospects, mental health, and broader health outcomes. To assist users with speech accessibility challenges, there are a range of augmentative and alternative communication (AAC) devices on the market, many of which utilizing Bluetooth® technology, that can enable users to communicate regardless of their individual challenges.

Speech-generating devices

Bluetooth® technology is leveraged in a range of speech-generating devices built for people with conditions such as MND, aphasia, cerebral palsy, Rett syndrome, or spinal cord injuries. Thanks to the ability to connect these to a range of PC or mobile devices via Bluetooth® technology, using the eye-tracker, users can send messages and emails or call someone and speak out loud using a synthetic voice. Similarly, other text-to-speech devices can pair with a smartphone via Bluetooth® connectivity to enable the user to make and receive calls and send text messages. In addition, tablet form-factor speech-generating devices equipped with Bluetooth® can connect to wireless speakers, keyboard and mice, and other Bluetooth® enabled accessories.

10%

of U.S. adults has a speech, language, and/or voice disability

Source: U.S. National Institute of Health

Hearing accessibility

According to the World Health Organization (WHO), more than 1.5 billion people around the globe (nearly 20 percent of the population) are living with hearing loss. This is anticipated to grow to 2.5 billion as early as 2050, with 700 million people expected to require hearing support in the form of assistive listening technology among other interventions. Bluetooth® technology has played a significant role in hearing accessibility for over a decade.

1.5B

people are living with hearing loss

Source: World Health Organization (WHO)

700M

people expected to require assistive listening technology by 2050

Source: World Health Organization (WHO)

With Auracast™ broadcast audio, Bluetooth audio transmitters (e.g. smartphones, laptops, TVs, PA systems) can now broadcast audio to an unlimited number of in-range Bluetooth audio receivers (e.g. headphones, ear buds, hearing aids) in private and public spaces, enabling greater accessibility, improved audio quality, and new user experiences.

Over the last 12 months, the number of Auracast™ broadcast audio capable solutions arriving on the market has accelerated significantly. These solutions, including transmitters, receivers, and assistant devices, are paving the way for increased hearing accessibility within both public and private arenas. ABI Research expects Auracast™ broadcast audio to become a standard feature within the majority of Bluetooth® enabled audio devices, and with nearly 3.5 billion Bluetooth® LE Audio enabled device shipments by 2030 alone, Auracast™ broadcast audio is set to revolutionize the audio and assistive listening landscape in the coming years.

Hearing aids and other Auracast™ receivers

There is now a great selection of Auracast™ broadcast audio capable hearing aids and cochlear implants on the market, while others have and will continue to receive firmware updates to enable this capability over time. Some of the more notable products already available include the Cochlear Baha 7, the GN Hearing Beltone Commence™, Beltone Envision™, Beltone Serene™, ReSound Nexia™, ReSound Savi™, and ReSound Vivia™ hearing aids, and the Starkey Edge AI hearing aid. Alongside these, several over-the-counter (OTC) hearing aids are also beginning to support Auracast™ broadcast audio, including the Yeasound RIC800, and the Zepp Clarity Omni, making it simpler and more affordable for more people facing hearing accessibility challenges to take advantage of Auracast™ broadcast audio. By 2030, ABI Research expects over 34 million Bluetooth® enabled hearing aids and OTC hearing aids will ship annually.

Beyond hearing aids, there is now a wide range of Auracast™ broadcast audio capable receiver devices, such as headphones and earbuds on the market. While these devices are not meant to replace hearing aids, they can still bring benefits to users who may not be comfortable wearing a hearing aid, people who suffer from milder hearing loss, as well as neurodivergent users who may benefit from the ability to use their own headsets to isolate themselves from outside noises and reduce the risk of sensory overload. Meanwhile, having Auracast™ broadcast audio as a new standard feature on all Bluetooth® audio devices enables users to take immediate advantage of its benefits while journeying towards more specialized hearing assistance over time.

34M

Bluetooth® hearing aids will ship annually by 2030

Source: ABI Research

Examples of receiver products include true-wireless (TWS) earbuds, such as the Audeara Buds, the Avantalk Infinity, the Creative Aurvana Ace, Ace 2, Zen Air Plus, the Jabra Elite 8 and Elite 10, the LG xboom Buds, the Panasonic Technics EAH-AZ100, the Samsung Galaxy Buds2 Pro, Buds3, and Buds3 Pro, and the Sennheiser Accentum True Wireless and Momentum True Wireless 4. Meanwhile, over-the-ear headphones, such as the Creative Zen Hybrid Pro, the Humantechnik earisMAX, and the Sony WH-1000XM6, also support Auracast™ broadcast audio.

This universal approach to assistive listening has the additional benefit of making those with hearing loss feel less stigmatized and instead fosters a much more inclusive, shared experience that is open to everyone. This should also encourage a much wider range of visitors to take advantage of these systems across a breadth of receiver devices.

Auracast™ transmitters

Over the last year or so, the availability of Auracast™ broadcast audio transmitters in a range of form factors has grown significantly. These are enabling accessible audio experiences in personal settings alongside an increasing number of public venues.

Personal, in-home, and retrofit Auracast™ transmitters

Auracast™ broadcast audio is expected to become a standard feature on smartphones, tablets, and laptops, enabling them to be leveraged as transmitters that can broadcast audio to an unlimited number of nearby receiver devices, such as headsets or hearing aids. Leading vendors, including Samsung, Xiaomi, and Sony, already support Bluetooth® LE Audio and Auracast™ broadcast audio capabilities, creating compelling new personal and in-home accessible audio experiences.

Alongside this, many TV manufacturers are starting to embed Auracast™ broadcast audio within their devices directly. Some examples include the 2025 LG OLED 4K TV, and a number of QLED TVs.

There are also many dedicated Auracast™ broadcast audio transmitters now available for use within home and other personal environments. These come in a variety of form factors, including USB dongles that can connect to mobile devices and PCs, 3.5 mm adapters that can plug into existing audio sources such as TVs or airplane audio outputs, as well as dedicated TV streamers and portable microphones. Some examples include the Avantree Voyager, and DG60 Aura, the Creative BT-W6 USB Dongle, the Starkey Edge TV Streamer among

others. These are typically simplified solutions either for personal use or that could enable homes and small venues to retrofit the ability to broadcast audio streams to multiple users simultaneously, ideal for use cases such as unmuting silent TVs in bars or gyms.

Public venue Auracast™ assistive listening systems

Opportunities for public deployments of Auracast™ broadcast audio are enormous, with the technology envisioned to be leveraged across a diverse range of locations, including conference and lecture halls, theatres and cinemas, airports and transportation hubs, museums, places of worship, guided tours, and in one-to-one type deployments at reception desks and countertops within retail and other service environments. According to ABI Research, there are more than 60 million venues globally that could potentially benefit from assistive listening or augmented audio experiences. Some of these venues may support multiple use cases, ranging from assistive listening solutions to silent TV use cases, or the emergence of new audio experiences. With the potential for multiple audio transmitters per venue, this equates a very large potential total addressable market (TAM) for Auracast™ broadcast audio solutions.

The first fully fledged Auracast™ broadcast audio enabled assistive listening systems designed for public venues have now arrived. Auri™, from Listen Technologies and Ampetronic, was the first solution to market targeting assistive listening within public venues, comprised of the Auri™ TX2N Transmitter and Auri™ RX1 Receiver devices. Williams AV also introduced its Infinium™ system designed for commercial AV environments, comprised of the Infinium™ Auracast™ controller, transmitter, and portable Infinium™ R1 Auracast™ receiver. Meanwhile, Bettear's B-CASTER Auracast™ streamer and the AuraGate from Opus Technologies are other products targeting public venues that are now available.

Countertop Auracast™ transmitters

One of the larger longer-term opportunities for Auracast™ broadcast audio will be found within one-to-one deployments at public service counters or reception desks. One solution designed specifically for this is the Auraloop from Opus Technologies. This solution integrates support for both magnetic loop and Auracast™ broadcast audio in the same product, with a visitor able to scan a QR code at the counter to set up a confidential one-to-one conversation.

Tour-guide Auracast™ transmitters

Another Auracast™ broadcast audio use case is the ability to enable users to join audio tour systems within venues such as museums, stadiums, convention centers, and tourist attractions, among other venues. One example of this on the market today is the Bettear B-RTX, a combined Auracast™ broadcast audio transmitter and receiver device that is aimed to support a range of visitor experiences.

Real-world Auracast™ locations

Meanwhile, the first public deployments of Auracast™ broadcast audio have emerged this year, bringing benefits to visitors facing hearing and visual accessibility challenges, neurodivergent visitors, and other visitors with accessibility hurdles. Some of the most notable examples include:

Sydney Opera House, Sydney, Australia:

In March 2025, the Sydney Opera House deployed Auracast™ broadcast audio within three of its venues, building on existing deployments of hearing loops and FM based assistive listening systems. Visitors attending the venue have noticed significant improvements in audio quality, particularly regarding music, as well as a more inclusive experience.

Bristol Temple Meads Station, Bristol, United Kingdom:

Earlier this year, Bristol Temple Meads railway station became the first transport hub to test Auracast™ broadcast audio, enabling travelers to listen to the station audio and public announcements more clearly.

Birmingham Hippodrome, Birmingham, United Kingdom:

The Birmingham Hippodrome theatre recently deployed Auracast™ broadcast audio, enabling users to listen to shows through headphones, neck loops, or other Auracast™ broadcast audio compatible devices such as hearing aids or earbuds, as well as enabling audio description for users confronting visual accessibility challenges.

Contact Theatre, Manchester, United Kingdom:

The Contact Theatre, a charity, arts venue, and theatre in the center of Manchester recently upgraded from its 30-year-old hearing loop solution to Auracast™ broadcast audio. Immediately, audience members noticed significant improvements, especially in audio quality, and Auracast™ broadcast audio now serves as the primary assistive listening system in the theatre.

Grace Lutheran Church, Woodstock, Illinois, United States:

Leveraging the Ampetronic Auri solution, the Grace Lutheran Church replaced its existing FM assistive listening system with Auracast™ broadcast audio in just a few hours, with churchgoers noticing a significant improvement in sound quality and ease of use, encouraging more people to take advantage of it.

While some of these locations may offer complementary assistive hearing technologies, such as hearing loop, FM, and IR, it is important to remember that most venues around the globe do not have any form of assistive hearing technology in place. Auracast™ broadcast audio, supported by the ubiquity of the Bluetooth® consumer audio ecosystem, has the opportunity to significantly increase the adoption of assistive listening solutions thanks to its low complexity and ability to support a wider range of receivers.

This combination of hearing aid, OTC hearing aid, transmitter, receiver, and fully fledged assistive listening systems show the growing diversity of the Auracast™ broadcast audio ecosystem. ABI Research expects to see a rapid expansion in the availability of these solutions in the coming years as Bluetooth® LE Audio penetration increases, people become more familiar with the technology, more and more venues start to integrate the technology, and people are able to test this out in the real world. The recent increase in the availability of these solutions is very encouraging and will rapidly expand the potential of assistive listening technology over the next decade. More examples of real-world Auracast™ locations can be found on the Bluetooth SIG website.

How Bluetooth® is uniquely positioned to enable a more accessible world

As this paper has demonstrated, Bluetooth® technology is being leveraged in an increasingly diverse range of assistive products that are enabling users with a variety of accessibility challenges to live more independently, participate more confidently, and have greater opportunities in their day-to-day lives. There are many characteristics of Bluetooth® technology that make it the ideal technology for many assistive products, including:

Low-power consumption: Many assistive products, such as hearing aids, wearables, skin-worn sensors, smart glasses, and smart mouth wear come in extremely small form factors with limited battery sizes. As a result, the ultra-low power benefits of Bluetooth® technology uniquely position it to enable hours, days, or months of operation depending on the specific use case. This enables users to use their products for longer while enabling greater flexibility through wireless operation.

Ubiquitous presence in mobile and computing devices: Many of these assistive products require connectivity to PCs, mobile phones, or tablets to enable a variety of functions, including data transfer, firmware updates, remote configuration, diagnostics, remote control, and activity tracking, among others. Bluetooth® technology's ubiquitous presence in these devices means it is uniquely positioned to enable these solutions.

Audio capabilities for in-ear guidance and discreet assistance: Many visual accessibility solutions require voice readouts to provide directions, descriptions of surroundings, or other information. Thanks to the wide availability of Bluetooth® audio solutions, users can receive more discreet, in-ear guidance directly to their headphones or hearing aids.

Dedicated accessibility features: Dedicated accessibility features and standards such as Auracast™ broadcast audio are uniquely positioned to solve the specific accessibility challenges of today, opening the potential for more public venues to leverage assistive listening technology and a much wider expansion of hearing accessibility for both personal and public usage scenarios.

Continued technology innovation: Bluetooth® technology continues to evolve and add new features and capabilities, many of which will benefit the future development of assistive products. For example, work is ongoing to bring several further enhancements to Auracast™ broadcast audio, such as defining a standardized approach when using multiple Auracast™ transmitters in larger environments, support for more streams to support multi-language broadcasts, and a standardized approach to discovering Auracast™ broadcasts on constrained receiver devices, such as hearing aids, without the need for a smartphone. Similarly, reductions in latency through the ultra-low latency (ULL) human-interface-device (HID) enhancement project aims to make Bluetooth® controllers as responsive as those using USB-wired or proprietary wireless communications. This could prove beneficial to many assistive HID and control devices.

A diverse member ecosystem: The competitive and ever-growing ecosystem of Bluetooth® IC vendors and other solution providers continue to drive improvements on other key metrics, such as power consumption, robustness, size, and range, providing enhanced flexibility and convenience for users of assistive products. These solutions enable a growing number of manufacturers to create new assistive products and bring innovative experiences to users faced with a wide range of accessibility challenges.

This paper has demonstrated just a few notable examples of how Bluetooth® technology is enabling a more accessible world, but this is by no means an exhaustive list. New products are emerging on a regular basis, and with accessibility challenges expected to impact more people over the next few decades, the range of assistive products will become even more diverse, and a combination of growing demand, technology innovation, new product types and form factors, regulatory incentives, and greater familiarity will all drive the market forward.

While these are good initial steps, there is still much work to be done to support a more accessible world, and product manufacturers should investigate the role that Bluetooth® technology can play in enabling next-generation assistive products and experiences as the market opportunities grow in the years to come. Meanwhile, the Bluetooth SIG is committed to creating a better world through the enhancement and greater availability of assistive solutions enabled by Bluetooth® technology.

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