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Enhancing the Sport Spectatorship Market for Hearing-Impaired Audiences: Accessibility and Engagement Strategies

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Abstract

This paper examines the application of the Americans with Disabilities Act (ADA) to the in-person sport spectatorship experience of hearing-impaired individuals. The delivery of the core sport product, especially at the stadium, is not equally accessible to individuals with disabilities, particularly for audience with hearing impairments. Although the ADA mandates accessibility in public accommodations, its implementation for communication access within sport venues remains inconsistent. Through a focused review of legal frameworks, venue practices, and emerging technologies, this paper identifies gaps in current accessibility efforts and outlines practical recommendations to enhance inclusivity. Key strategies include the use of AI-powered real-time captioning, availability of sign language interpreters, and staff training. These measures not only fulfill ADA requirements but also represent an opportunity to engage a growing and underrepresented market of sport consumers.

Keywords: accessibility, disability, fan engagement, hearing-impairment, sport spectatorship

As sports spectatorship continues to evolve, creating inclusive experiences for individuals with disabilities is not only a moral imperative but also a strategic opportunity to expand market reach and audience engagement. Although sports organizations have made visible progress in supporting athletes with disabilities, accessibility for spectators, particularly those with hearing impairments, has often been overlooked. This paper focuses exclusively on in-person sports spectatorship in U.S. venues, as defined under Americans with Disabilities Act (ADA, 1990) regulations. In the United States, the ADA mandates that public accommodations, including sports stadiums and facilities, implement accessibility measures under Subchapter III, “Public Accommodations and Services by Private Entities.” However, although the ADA establishes guidelines for physical accessibility, its provisions for enhancing the in-person spectating experience for individuals with hearing impairments remain limited.

The core product of sport, when experienced live in a stadium, is not equally accessible to all attendees. Although closed captioning is mandated for televised broadcasts, no such requirements exist for in-stadia services, and accommodations for hearing-impaired spectators vary widely across venues. This paper examines the extent to which the ADA provides accessibility guidelines for hearing-impaired individuals and explores strategies to enhance their in-venue spectating experience.

Hearing loss affects a large portion of the U.S. population. Approximately 11 million Americans identify as deaf or have serious hearing difficulty (Erickson et al., 2025). More than 12 million report hearing difficulty, a 17% rise since 2010 (Lin et al., 2011), outpacing overall U.S. population growth (US-AFacts, 2023). Despite this sizable and expanding demographic, sport organizations and venue managers have largely overlooked hearing-impaired individuals as a distinct consumer group, missing opportunities to both enhance equity and expand their spectator base.

Existing accessibility regulations primarily address physical access to sports facilities rather than ensuring that the core entertainment experience is inclusive. Prior research (Calder et al., 2018; Devas, 2003; Dickson et al., 2016) has focused on improving physical accessibility to sporting venues but has paid little attention to the accessibility of the sport product itself for spectators with hearing impairments.

In this context, this paper seeks to answer the following research questions:

- RQ1: How are ADA-mandated accessibility provisions for hearing-impaired spectators interpreted and implemented in U.S. sports venues?
- RQ2: To what extent is the core sport product, particularly its intangible entertainment value, accessible to hearing-impaired audiences in live stadium settings?

By addressing these questions, this study sought to assess current accessibility provisions and propose practical recommendations for enhancing the in-stadia spectating experience for individuals with hearing impairments.

Legal and Regulatory Framework: ADA

The Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. § 12101 et seq., is a foundational civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life.

This includes access to public accommodations such as sports stadiums and recreation facilities. Title III of the ADA mandates that private businesses and nonprofit organizations serving the public, including sports venues, must provide equal access for individuals with disabilities. This includes both physical infrastructure and the services offered within these spaces.

In the context of live sports spectatorship, the law requires accessible parking, entrances, restrooms, concession areas, and designated seating. For stadiums constructed after 1990, ADA guidelines make it clear that accessible design is not optional. As outlined by the Department of Justice (DOJ), new stadiums must allow “people with disabilities, their families, and friends [to] enjoy equal access to entertainment, recreation, and leisure” (U.S. Department of Justice Civil Rights Division, n.d.). This principle was reinforced in the 2024 DOJ settlement with the Chicago Cubs, which required significant accessibility upgrades at Wrigley Field, an example of federal enforcement even at historic, high-profile venues (Office of Public Affairs, 2024).

Equally important are the ADA’s provisions for communication access. Under Title III, sports venues must ensure “effective communication” for individuals with hearing impairments, including people who are deaf, hard of hearing, or deaf-blind. To meet this requirement, venues must provide auxiliary aids and services such as sign language interpreters, real-time captioning (e.g., CART), printed transcripts, and assistive listening systems (U.S. Department of Justice Civil Rights Division, 2023). Section 219.2 of the ADA Standards states that assistive listening systems must be installed in any assembly area where audible communication is central to the experience. These systems must cover the full venue and be available for at least 4% of the total number of seats. In addition, signage must be posted to notify spectators that assistive listening devices are available upon request.

A landmark example of how these legal requirements have been tested and clarified is *Feldman v. Pro Football Inc.* (2008). In this case, the plaintiffs argued that FedEx Field failed to provide adequate captioning of game-day announcements. The case resulted in a 2008 court ruling confirming that the stadium’s updated captioning met ADA standards, setting a precedent that still influences how communication access is interpreted for in-person spectatorship. Although the law does not require unlimited access to every possible accommodation, it does require equal, reasonable, and meaningful access, unless it would cause an undue burden. This exception rarely applies to basic services like captioning or assistive listening for spectators in sports stadiums. Although the ADA clearly outlines guidelines, especially under Title III, which require auxiliary aids like assistive listening devices, real-time captioning, and signage for spectators with hearing impairments, implementation in sports stadiums remains inconsistent. More than 30 years after the ADA passed, many stadiums still fall short of providing complete communication access for spectators with hearing impairments (Lower & Peterson, 2010).

Despite the clarity of the ADA’s communication access requirements, implementation across U.S. venues remains uneven (McCormick, 2025). For example, the 2024 U.S. Open Tennis Championships promoted full accessibility, yet on-the-ground experiences reported by deaf spectators revealed that captioning was intermittent and that venue staff were unfamiliar with the limitations of assistive listening devices (Noll, 2023). Sorenson, the accessibility sponsor for the event, ultimately had to implement its own interpreting and captioning services to bridge these communication gaps. This real-world case highlights the gap between written compliance and actual service delivery, even at major national events.

This continued inconsistency points to a larger issue: Stadiums may meet baseline ADA obligations

without meaningfully supporting the full sensory experience of sport spectatorship. The growing number of deaf and hard-of-hearing fans, along with technological advancements in communication access, present a timely opportunity to reevaluate how ADA guidelines are interpreted and enforced in practice. This gap between regulation and reality highlights the need for greater focus on how legal frameworks are applied, particularly in ensuring equitable access to the sensory aspects of live sports events.

Understanding the Hearing-Impaired Spectator Market

The hearing-impaired population in the United States represents a substantial but underengaged segment of potential sport spectators. According to the National Institute on Deafness and Other Communication Disorders (NIDCD), approximately 37.5 million American adults report some degree of hearing difficulty (Blackwell et al., 2014). This population spans a wide range of individuals with mild to moderate hearing loss to those who are profoundly deaf. For the purposes of this paper, “hearing-impaired” includes deaf individuals who use American Sign Language (ASL), hard-of-hearing individuals who may rely on lip reading or hearing aids, and older adults who experience age-related hearing loss. This broader definition is consistent with ADA protections, which apply to individuals with both partial and total hearing loss. Importantly, this is not only a large population but one with influence. Hearing-impaired individuals often attend events with family or friends, commonly called “companions,” who also consider venue accessibility in their decisions (Grady & James, 2013). In this way, accessibility accommodations have a multiplier effect on event attendance. Many individuals in this group, especially older adults, also have the financial means and free time to engage in leisure activities like sport spectating.

Olivieri and Hajducky’s (2024) survey of 120 professional sports teams in the United States highlighted that fans with “invisible disabilities,” including those who are deaf or hard of hearing, face challenges such as limited staff awareness, a lack of printed materials, and poor signage. Fewer than half of the teams surveyed offered clearly designated entrances or menus that could support communication access. These findings emphasize how accessibility issues persist in areas beyond just physical infrastructure, directly affecting the overall fan experience (Olivieri & Hajducky, 2024). Understanding this market segment is essential for sport organizations seeking to expand attendance, build brand loyalty, and promote inclusive fan engagement. More than a compliance requirement, inclusion of hearing-impaired spectators represents an opportunity to reach a growing and motivated demographic of fans who want to experience live sport on equal terms. To fully engage this audience, it is important to assess how current sports venues are addressing the needs of hearing-impaired spectators. This includes providing accessible and inclusive in-person experiences.

Spectator Experience and Accessibility in Sport Stadiums

Current practices in U.S. sports venues show a wide range of accessibility initiatives aimed at supporting deaf and hard-of-hearing spectators. At one end of the spectrum, venues like Mercedes-Benz Stadium in Atlanta have implemented closed captioning on handheld devices and video boards, along with assistive listening devices available through guest services. Madison Square Garden in New York offers both open and closed captioning on ribbon boards during basketball and hockey games, with sign language interpreters available upon advance request. These services represent intentional planning that improves accessibility without interrupting the fan experience.

However, challenges remain across much of the industry. Olivieri and Hajducky’s (2024) survey

shows that many teams still do not provide even basic communication access features such as printed menus or visual signage indicating availability of listening devices. Staff often lack training in communicating with deaf or hard-of-hearing individuals, and some venues do not publicize their accommodations, leaving fans unaware of what is available to them. According to Sorenson Communications (2024), a sponsor of the 2024 U.S. Open, deaf attendees reported inconsistent captioning and limited staff understanding of communication technologies, which required them to rely on their own interpreting tools to fully engage with the event experience. When spectators rely on third-party apps and their own solutions, such as pairing a broadcast audio feed with mobile ASL interpretation, it highlights institutional gaps in meeting ADA expectations. This shows that some of the barriers that remain most prominent for hearing-impaired individuals spectating sports include: (a) lack of real-time captioning for announcements and in-game commentary, (b) inconsistent availability of assistive devices, (c) unclear or absent signage about accessibility services, and (d) limited ability to request or use interpreting services without long lead times.

The smart stadium movement offers promising innovations to fill these gaps (Yang & Cole, 2020). Wi-Fi-enabled mobile apps allow fans to order food, view stats, and even receive live captioning or language interpretation services. Some venues, like AT&T Stadium, allow guests to select preferred language channels on devices. In theory, these digital enhancements offer scalable solutions to accessibility; however, their impact depends on integration, staff support, and user education. There is also increasing awareness that inclusive technology benefits more than just fans with disabilities. Captioning can assist fans in noisy environments. Visual signage helps those with cognitive disabilities or nonnative English speakers. Assistive listening systems can support aging fans with mild hearing loss. The universality of these features strengthens the case for treating them as baseline enhancements rather than optional add-ons. To ensure lasting impact, sports organizations must shift from compliance-based models to proactive, user-centered design (García et al., 2016). Accessibility should be integrated from the beginning of stadium planning and be visible at all fan touchpoints, ranging from ticketing to in-seat service. With consistent application of existing ADA standards, paired with emerging technology, sport venues can transform into inclusive spaces that welcome all fans equally.

Emerging Technologies and Future Strategies

The integration of emerging technologies into sport stadiums offers new possibilities for enhancing accessibility and inclusivity, especially for hearing-impaired spectators. As the concept of smart stadiums gains traction, innovations in communication tools, mobile services, and real-time assistive technology present practical pathways for improvement (Yang & Cole, 2020).

One key area of development is real-time captioning powered by artificial intelligence (AI). Tools like speech-to-text transcription services can now provide near-instantaneous captions for live audio, including announcer commentary, pregame interviews, and emergency messages. When integrated with stadium apps or displayed on ribbon boards and video screens, AI-generated captions have the potential to bridge communication gaps for deaf and hard-of-hearing fans (Kitchin et al., 2022; Koželj et al., 2025). Although not yet universally adopted, the availability of reliable, automated captioning is steadily improving, making it an increasingly viable option for sports stadiums to consider.

Mobile applications have also transformed how spectators engage with live events. For hearing-impaired fans, mobile apps can offer accessible menus, event guides, closed captioning, and even ASL interpreter access (Koželj et al., 2025). The Sorenson Express app, for example, demonstrated this at the 2024 U.S. Open by enabling deaf fans to receive on-demand ASL interpreting through their smartphones

(Sorenson Communications, 2024). This type of flexible, personalized support not only empowers users but also alleviates the staffing burden on venues that may not have full-time interpreters. Further, smart stadium infrastructure, which includes robust Wi-Fi, Bluetooth beacons, and geolocation services, supports fans with disabilities by delivering push notifications, wayfinding assistance, and digital prompts in real time (Yang & Cole, 2020). Although these systems are not exclusive to hearing-impaired spectators, their implementation improves the overall quality of the venue experience (Koželj et al., 2025). For instance, visual alerts paired with auditory cues can be deployed for announcements and time-sensitive updates, improving safety and enhancing inclusion.

In parallel, multilingual communication access is growing in importance. As many venues attract linguistically diverse crowds, accessibility features like audio channel selection, multilingual captioning, and interpreter services also benefit deaf fans who use ASL as their primary language. At AT&T Stadium, fans can choose English or Spanish audio for handheld captioning devices. This is an example of how inclusive design can address different access needs. Another area with strong future potential is universal design in venue planning (Koželj et al., 2025). Rather than retrofitting accessibility features after construction, universal design calls for venues to anticipate and incorporate inclusive infrastructure from the start (Koželj et al., 2025). This includes positioning caption boards in sightlines visible from multiple seating zones, ensuring adequate lighting for lip reading, and embedding accessibility content into mobile ticketing and fan engagement platforms. Future renovations and new venue designs should consider these best practices as baseline features.

Although these technologies hold promise, their success depends on a broader strategy: educating stadium staff, promoting service visibility, and involving users in design feedback (Grady & James, 2013). Even the most advanced system can fall short if fans are unaware of its availability or staff are untrained in its deployment. Teams and venues must prioritize staff development and create direct communication channels for fans to request support, give input, or report problems (Koželj et al., 2025). Ultimately, emerging technologies must be framed not just as tools for compliance, but as catalysts for innovation. By integrating assistive services into the mainstream event experience, venues can create welcoming environments that reflect modern values of inclusion, equity, and fan-centered design. As hearing loss continues to affect a growing portion of the population, such strategies will not only serve today's spectators but build a stronger, more inclusive foundation for the future of sport attendance.

Conclusion and Recommendations

Hearing-impaired individuals have historically been overlooked as a target audience within the sport industry, often treated as an afterthought rather than a core market segment. However, this group represents a significant and growing population of potential consumers, many of whom possess the time, interest, and disposable income to engage with live sport events, if equitable and meaningful access is provided.

The hearing-impaired population is diverse, encompassing individuals with partial hearing loss as well as those who are culturally deaf and use sign language as a primary form of communication. Recognizing this range is crucial for sport organizations aiming to implement inclusive strategies under the ADA. The ADA offers a foundational legal framework, but compliance alone is not enough. Sport organizations must move from reactive accommodations to proactive inclusion. The full fan experience, including ticketing, in-venue navigation, and emotional engagement with the game, should be intentionally designed to

be accessible. For compliance to be truly effective, it must go beyond minimum legal requirements. The ADA sets a floor, not a ceiling, for inclusion. Sport organizations should see accessibility not only as a legal obligation but as an opportunity to build stronger, more diverse fan communities. This includes proactive training of staff, regular assessments of accessibility practices, and partnerships with advocacy groups to improve services (Grady & James, 2013).

This manuscript has outlined key legal precedents, regulatory frameworks, and practical strategies that can assist sport organizations in enhancing the live experience for hearing-impaired fans. Tools such as real-time captioning, ASL interpretation, sensory alerts, and staff training are not only feasible but increasingly expected in a marketplace that values diversity and equity. Enhancing accessibility is not simply a moral imperative or legal requirement; it is a business opportunity to grow sport spectatorship by reaching underserved audiences. Moreover, inclusive design has multiplier effects: When hearing-impaired individuals attend events, they are often accompanied by friends or family. A more accessible environment therefore increases group attendance, strengthens community goodwill, and reinforces the brand's image as socially responsible and forward-thinking. Accessibility features also improve the experience for other groups, such as nonnative English speakers or older adults. This demonstrates the broader value of universal design principles.

Future research must delve deeper into the motivations and constraints that hearing-impaired fans experience when considering in-person sport consumption. Researchers should also explore how technological innovations, such as AI-powered tools, can be ethically and effectively integrated into venue operations. Importantly, scholars should not isolate accessibility as a singular issue but rather examine how cultural, structural, and economic systems shape disabled fans' experiences of inclusion or exclusion. In sum, creating equitable experiences for hearing-impaired sport spectators requires a shift in mindset, from mere compliance to a more profound culture change. By centering the lived experiences of disabled fans, sport stadiums and organizations can foster not only legal inclusion but emotional and communal belonging, ultimately expanding both their impact and their audience.

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