SVG VENUE INITIATIVE WHITE PAPER

RECOMMENDATIONS FOR SPORTS VENUES:

In-Venue Closed Captioning

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SECTION E: IN-VENUE CLOSED CAPTIONING

PURPOSE

With every new sports venue, remodel, or video-scoreboard renovation comes a decision each sports organization must make: how to comply with federal and local regulations on providing in-venue live closed-captioning content for the deaf and hard-of-hearing. The ever-increasing use of visual and aural technologies to present and enhance the game for attendees has also created the need to identify ways to provide an equal experience for deaf and hard-of-hearing fans. This is most effectively accomplished through captioning of the live aural content and presenting these captions on LED displays, TVs, and other auxiliary devices within the venue.

This section of the SVG Venue Initiative White Paper will summarize current regulations, review technical and operational requirements, and offer examples of quality in-venue captioning from several professional and collegiate teams.

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SVG VENUE INITIATIVE WHITE PAPER

E1. Introduction

The regulatory requirements for closed captioning of live and prerecorded content reach across many areas of business operations for sports teams and venues. In recent years, several legal battles have occurred when fans have filed suit against sports teams/venues for providing inadequate closed captioning of game-presentation audio. As a result, teams need to determine their purpose and goal of in-venue captioning, which can be to provide reasonable compliance with regulations or to provide an equal opportunity for deaf and hard-of-hearing attendees to fully experience and enjoy the game presentation. An additional consideration is that hard-of-hearing fans are not the only attendees who can benefit from live captions in a stadium or arena: because sports venues are generally loud and visually stimulating, live captioning in the seating bowl and throughout the venue enables fans to stay informed when they cannot hear all the PA announcements.

UNDERSTANDING CLOSED CAPTIONING

This paper will focus on what is needed to provide effectively captioned content for attendees of sports and entertainment events in stadiums and arenas.

While most people have seen closed captions on television, many have no idea how the spoken words of a program appear on their TVs. To understand the basics of captioning, one must first understand the differences between prerecorded and live captioning.

Prerecorded Captioning

Prerecorded content, such as episodic television programs or preproduced content, typically use an off-line captioning process. This allows the exact scripted dialogue and sound-effects descriptions to be imported or transcribed, then perfectly aligned with visuals on-screen and closed-captioned or encoded directly into the video-signal format for later distribution. This method produces a 100%-accurate textual representation of the aural content of a television program.

Live Captioning

Live unscripted events, such as sports, require real-time captioning. To produce it, a person trained as a real-time captioner listens to the live audio of the sports event and transcribes what is heard with a special stenography keyboard and specialized software.

For live in-venue sports captioning, a hybrid process of offline and real-time captioning will produce the most accurate textual representation of the aural content for a sports event. This requires an effective working relationship between the team and the captioner.

COMMON QUESTIONS TEAMS MUST ANSWER IN DEFINING THEIR COMPLIANCE

To determine the purpose and goal of in-venue captioning, each team needs to address a few basic considerations:
- What in-venue audio content should be captioned?
- How should in-venue audio content be captioned?
- Where should captioning be provided and displayed?
- What makes an effective captioning experience for deaf or hard-of-hearing guests?

E2. Summary of Regulatory Requirements

Each team/venue must do its own legal research in determining compliance for in-venue captioning according to federal, state, and local regulations.

Teams/venues should be aware of the following federal regulations that apply to accessibility for the hearing impaired. More information can be found in Section E8. Resources.

Americans With Disabilities Act (ADA)
- Title II: State and Local Governments
- Title III: Public Accommodations and Commercial Facilities
- Current and amended Department of Justice (DOJ) regulations concerning implementation of Title II and Title III

Rehabilitation Act of 1973
- Section 504
- Section 508

Twenty-First Century Communications and Video Accessibility Act of 2012 (CVAA)

For a comprehensive legal review of these regulations and live captioning for sports venues, read "Personal Foul: Lack of Captioning in Football Stadiums" by Marc Charmatz, Lindy L. Hedges-Wright, and Matthew Alex Ward. Valparaiso University Law Review 45.3 (2011): 967-1031

According to Charmatz, Hedges-Wright, and Ward, the DOJ has ruled in previous legal cases that *"defendants are to provide deaf and hard-of-hearing fans equal access to the aural information broadcast over the stadium bowl public address system ... which includes music with lyrics, play information, advertisements, referee calls, safety/emergency information, and other announcements."*

The most effective method for providing this information for the deaf and hard-of-hearing would be visual captioning of all public-address announcements before, during, and after the game, including:

- All play descriptions, scoring, and player information
- Referee and penalty announcements
- In-game promotions, contests, and entertainment action
- Advertising and commercials
- Emergency messaging
- Song lyrics
- End-of-game announcements and next-event information

This makes in-venue live sports captioning different from live sports-broadcast captioning in that the play-by-play and analyst commentary are not captioned. In-venue closed captions are constrained to whatever is announced over the PA system. This varies by sport as to how much and how detailed game-play announcements are. Regardless of the sport, most of the captioning consists of PA announcements made during pauses in game action. Understandably, effectively and accurately captioning lyrics to all songs played during a game can be a significant challenge for a captioner; as a result, many teams opt to provide lyrics for featured songs, such as the national anthem, and title/artist information to other songs played during their event.

E3. Technical Requirements

There are two parts necessary in providing in-venue captioning: technical infrastructure and captioning services.

TECHNICAL INFRASTRUCTURE

To deliver closed captioning to the widest variety of displays within a sports venue, the primary component needed is a closed-captioning encoder. This device is typically installed in the scoreboard audio/video-production rack room to allow easy access to various program audio sources. Venues need one captioning encoder for each live audio source the team wishes to caption.

What is a closed-captioning encoder?

The typical U.S. closed-caption encoder runs SDI video in and SDI video out and adds captions to the HD VANC (vertical ancillary data) space (or SD Line 21). These are called "closed captions" because they are embedded in the video signal but are invisible unless a closed-caption decoder is used to make them visible. Once the decoder displays the captions on the video and the captions become part of the picture permanently, they are often called "open captions."

Once an SDI signal has VANC captioning, it is often converted to a compressed MPEG signal for distribution around the venue — for example, to QAM or IPTV systems. The MPEG signal carries the closed captions in a special user data section of its stream. The captions can be decoded as needed on individual televisions or set-top-box–style receiver devices. One important caveat is that HDMI protocol does not preserve or pass closed-captioning data, so a choice to provide open captions by decoding and overlaying must be made before sending the video signal to a TV using HDMI.

CLOSED-CAPTIONING WORKFLOWS

Closed-caption workflows can also be used to power venue-accessible text options that are not directly related to TVs. For example, closed-caption encoders and LED-control systems often have additional features that provide formatted transcription text over local IP connections to text-only LED ribbon boards, fan-experience mobile applications, or other customized software systems.

In addition to the captioning encoder, it is necessary to provide audio and data connectivity to and from the encoder and the captioner. This requires a secure and reliable communication channel to transmit the program audio to the captioner and then transmit the caption data back to the caption encoder.

Captioners can be located onsite at the venue or remotely; in fact, the majority of live sports events are captioned remotely, with the captioner requiring only a feed of the PA audio to do the job. Either way, the audio can be transmitted using a dedicated low-latency streaming device or through a telephone call-in line with an audio coupler. When one of these systems is used, the caption data is transmitted back to the caption encoder either through IP telnet connections or with a dial-up modem.

The recommended and preferred method is to implement captioning equipment that uses the latest IP-based technologies and avoids using telephone lines and phone hybrids.

Says Bill McLaughlin, VP of Product Development, EEG Enterprises, *"iCap (by EEG) works over standard outbound internet connections and is supported by nearly all U.S. captioning providers. With iCap, the audio signal is transmitted directly from the iCap-enabled closed-caption encoder. To communicate with a captioner, you will need either an internet*

connection or two telephone lines (one suitable for use with a modem) into the caption encoder. If the encoder does not support iCap technology, you will also need either the telephone audio coupler or an audio-streaming device."

CAPTIONING SERVICES

Once the proper technical infrastructure to provide closed captioning is in place, the method of transcription must be considered.

The predominant and currently most-effective method of live in-venue captioning of sports events is to use a trained real-time captioner. Captioners typically work as independent contractors or through captioning-services agencies and are paid an hourly or daily rate.

Some venues bring real-time captioners onsite to work. In this case, the captioner will need a small workspace where there is space to set up a laptop and keyboard and where the announcements can be heard clearly and transcribed. The captioner will need suitable power outlets for the equipment and one or more ways to connect to the closed-caption encoder through local IP, an outbound internet connection, or an RS-232 serial cable.

Fig. 1: Example of onsite captioner. Photo courtesy of Patti White
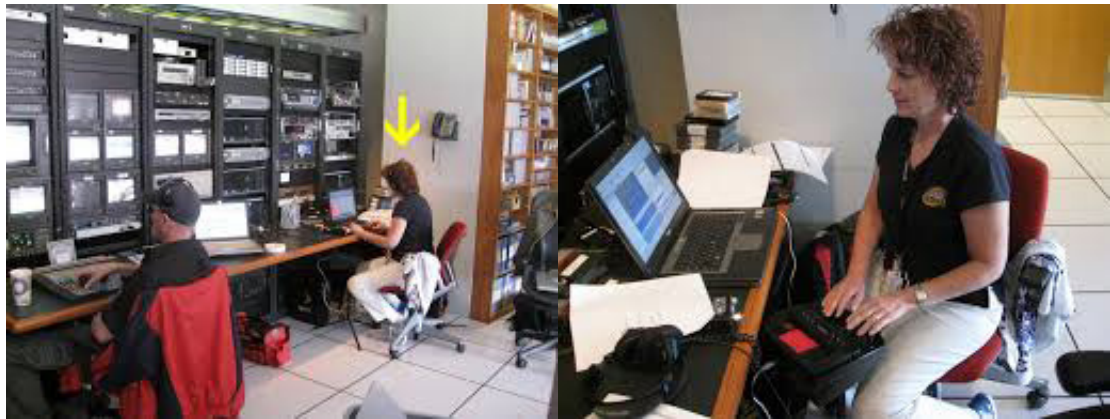
More commonly these days, real-time captioners work remotely from their home offices. With the proper connectivity and event-day information from the team, remote captioning can be an accurate and cost-effective method. There are many transcription and court-reporting services available, so it is important for teams to contract with highly experienced live–sports-captioning services. Teams typically secure season or multiseason contracts with a captioning company. When this is done, the benchmark for performance should be in-venue experience and accuracy.

E4. Display Options/Recommendations

There are generally three display methods used to present captions within a venue: LED Displays, Handheld Devices, and Televisions. A best practice would be to make all three options available because each offers its own benefits for deaf or hard-of-hearing fans.

LED DISPLAYS

The most effective way to fulfill compliance requirements is to provide dedicated LED displays in the bowl seating area for captioning. The best placement of these displays is below the main videoboards because this is similar to what people are accustomed to with broadcast-TV captioning. Since this LED "real estate" may not be available, dedicating LED ribbon or fascia-board area in proximity to the main videoboards is often used. Depending on sightlines,

this ribbon display should be duplicated on both sides of the field/court so that it is visible from every seat and every fan can easily read the captions on at least one display.

Tony Kuck, Product Manager, Live Event Control Systems, Daktronics, provides a few recommendations for closed captioning on LED displays based on Daktronics' industry experience and effective captioning deployments by the company's customers:

- **Number of Lines**
  Dedicate a minimum of 2 lines; 3 or 4 would be best.
- **Number of Characters Per Line**
  Dedicate a minimum of 25 characters per line; 30-32 would be best.
- **Font Size/Viewing Distance**
  Daktronics recommends the equation that 1 in. of LED character height allows a maximum viewing distance of 50 ft. (a 10-in. character is legible up to 500 ft. away). Thus, a venue must consider what display will be used for captioning and where the fans are seated in relation to the display. This can vary by venue as well as by sport: for example, football stadiums are configured different from baseball. Using font sizes between 10 in. and 20 in. will provide effective readability depending on maximum distance to fans.
- **Location**
  The ideal location is directly below the main videoboard(s). Understanding that this is prime real estate, teams should dedicate locations on both sides of the venue in visual proximity to the main videoboard(s) to provide as equal a view as possible from all areas of the seating bowl.
- **Consideration**
  Depending on the sport, venues can maximize their captioning displays by enabling the ability to trigger logos or other content when captioning is not active.

Fig. 2 (left): Yankee Stadium. Example of three lines of 32 characters in an optimal location.
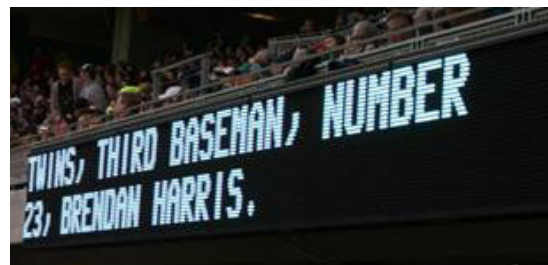*Photo courtesy of Jennifer Bonfilio*
Fig. 3 (right): Target Field. Example of two lines of 28 characters.
Photo courtesy of Daktronics

HANDHELD DEVICES

For venues currently providing in-venue captioning, the most common method is through handheld mobile devices. This method can be delivered on proprietary devices provided by team guest services upon request or through mobile apps available on the guests' personal mobile device. Mobile apps are a growing part of many venues' fan-experience strategies and frequently include features to access live captioning of events.

However, there have been legal challenges to venue accessibility plans that require use of a mobile device to access captioning and don't provide any type of scoreboard/LED alternative. The trouble has been that some users do not own devices compatible with these programs and, even when the venue provides rental or loaner devices, some patrons have been confused by the software or felt that it was too distracting to use while watching the event. Additionally, handheld devices may not be conducive to an "equal" experience for deaf or hard-of-hearing fans, requiring them to look at the device for play information and inhibiting their ability to watch fast-paced sports, such as hockey, soccer, or basketball. Also, some deaf or hard-of-hearing fans use sign language and need their hands free to communicate; therefore, having to hold a device can be ineffective.

TELEVISIONS

To ensure that deaf or hard-of-hearing fans can stay informed on the game when they are not in their seats, televisions in concourse areas, suites, and other stadium locations offer another good route for captioning. With screens that have caption decoders in them (for example, any consumer-style HDTV or set-top box), decisions on displaying captions embedded in the video can be made locally and individually at each TV location via remotes. If screens are LCD monitors that do not have their own caption decoder, decisions about where to display captions will need to be made at the distribution point. If there is one input to the router that shows captions and one with the same video and audio but without captions, the two signals can be routed as desired to different areas of the facility. A general recommendation is to evenly distribute captioning on half the concourse and public-area TVs.

E5. Operational Best Practices

According to Patti White of Good Sport Captioning, which provides in-venue captioning for more than a dozen professional and collegiate teams, accuracy is essential.

"Accuracy is a big thing in the captioning world. ... Live venue captioners need to be at the top of their game because it is live and (if displayed in the seating bowl) the text is there for ALL to see."

When asked how accuracy is accomplished in live sports captioning, White says, *"Accuracy is experience, skill, and preparation. ... When all you do is sports captioning, you become part of the teams. When the captioner can feel a part of the team and the show, accuracy goes up."*

Regardless of the technical decisions a team makes on how to provide in-venue captioning, the key to an accurate and effective experience for all is consistency and communication between the team and the captioner for each game. Since much of what is announced during pauses in game action is scripted material, providing scripts and rundowns to the captioner will increase accuracy. Depending on the sport, pre-event preparation can take 30-90 minutes. Captioners import rosters, scripted PA reads, and preproduced-video–content scripts into their captioning

Fig. 4: Captioning software.
Photo courtesy of Doug Swan
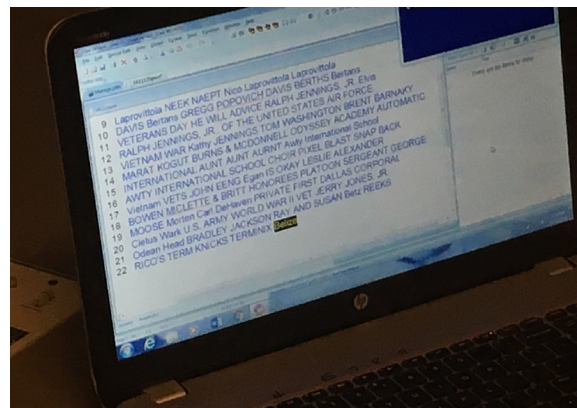
software and format it for output. This allows them to "punch" it out as it is read rather than transcribing it live. Many of these announcements are standard, requiring only names of honorees, contestants, sponsors, and opponets to be changed each game.

Jennifer Bonfilio of Coast 2 Coast Captioning, which provides captioning for NFL and collegiate teams, shares her thoughts on what makes an effective live sports captioner.

"A vigorous training program is essential to creating a qualified and talented captioner. A captioner with many years of experience in broadcast-sports captioning and a deep knowledge of his/her captioning software and scripting functions are crucial to preparing him/her for captioning live in-venue sporting events. .... A subpar captioning product would surely be the result of an inexperienced captioner without much 'on-air' time being entrusted with such a complex assignment, if a captioner does not have experience preparing and sending pre-scripted material, and/or if scripts are not prepared in advance and the captioner 'wings' the entire event live.

Below are suggested operational best practices for teams providing in-venue captioning:

- When selecting a captioning-service provider, ensure that it provides captioners who have extensive experience in live sports captioning and meet the certifications mentioned above. Additionally, request game consistency in captioners so that they become familiar with the team and the game presentation.

- Coordinate system testing with your captioner, with ample time prior to preseason to ensure that the captioning workflow and displays are functioning optimally.

- Assign an organizational point-of-contact to act as liaison between game production and the captioner before the season and during each event. It is imperative that this representative be responsive and engaged in the captioning process.

- Provide captioner scripts of all PA announcements, show rundowns, flip cards, dialogue of preproduced video content, and title/artists of all music used 24 hours in advance of the game.

- Deliver all scripts and documents as editable Word or Excel documents, not as PDF documents. Additionally, if using scripting software such as ShoFlo or GameTime Pro, provide login access to the captioner.

- Each game, establish and maintain a communication connection with the captioner, via texting or on-line chat tool, such as Google Hangouts, to facilitate last-minute changes in contestant names or script.

- Advocate for and implement captioning equipment that uses the latest IP-based technologies. Avoid telephone lines and phone-hybrids.

- Provide an on-line web-camera feed of the LED captioning display to allow the captioner to monitor captioning activity throughout an event.

E6. Team Examples

Raymond James Stadium
Tampa Bay, FL

Raymond James Stadium and the Tampa Bay Buccaneers provide both in-venue LED captioning of their PA audio and radio play-by-play captioning on their venue television system.

In addition to the PA announcements on the LED boards, the Tampa Bay Buccaneers also caption their radio play-by-play audio for distribution and display on roughly half their concourse TVs. Not a benefit just for the hard-of-hearing, this allows all fans on the concourses to be aware of referee calls and game action when the PA or broadcast audio is not audible. The Baltimore Ravens also provide captioning of their radio play-by-play on concourse TVs.

Fig. 5 (above): Raymond James Stadium. View of SE corner display showing the size of dedicated captioning area

Fig. 6 (right): View from NE corner.

Fig. 7 and 8 (below): Closed captioning on concourse TVs

Photos courtesy of Rick Price

Toyota Center
Houston, TX

The Toyota Center is one of a few professional arenas providing captioning on LED displays within the bowl. Their captioner is onsite.
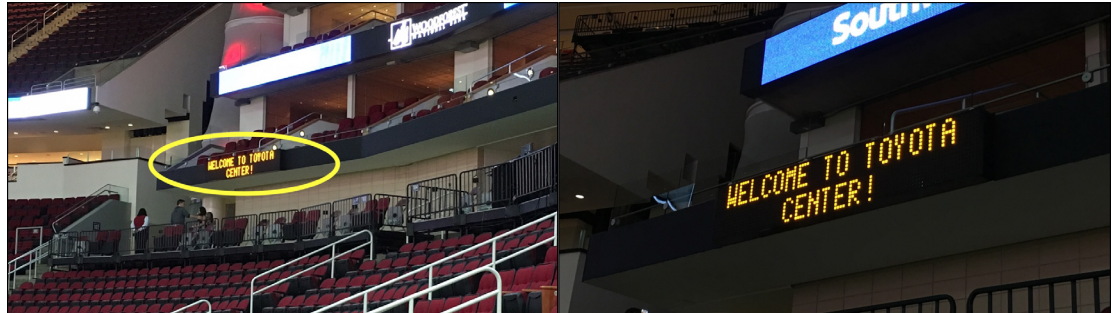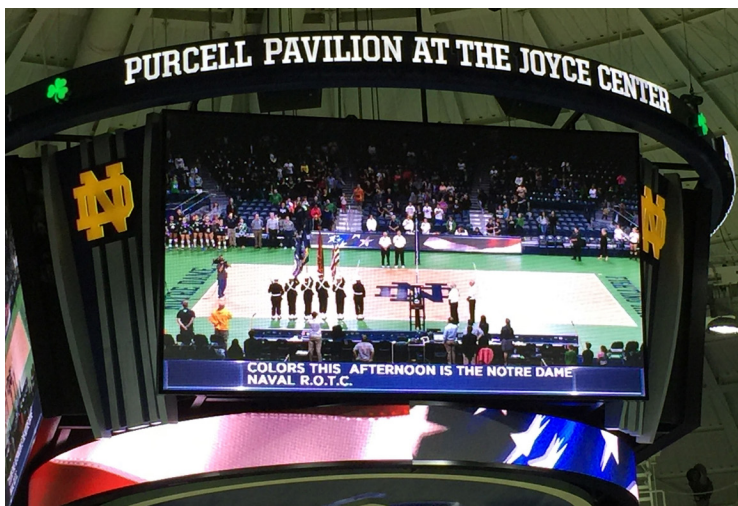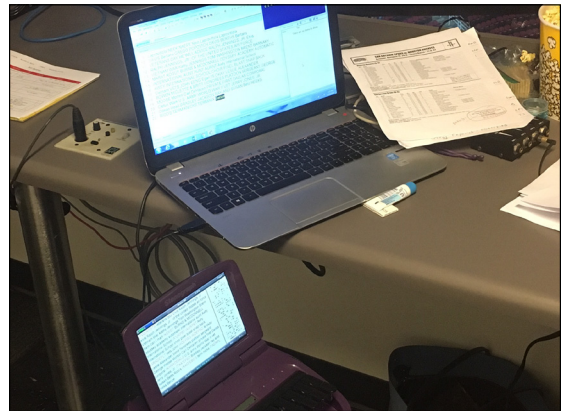

Fig. 9 (above): Toyota Center. View of one of two dedicated captioning fascia displays.

Fig. 10 (right): Toyota Center. View of dedicated space for real-time captioner.

Photos courtesy of Doug Swan

University of Notre Dame
South Bend, IN

The University of Notre Dame currently provides captioning directly on the main videoboard for hockey, basketball, and volleyball. Scott Rinehart, Director, Broadcast Technology, says that, given the prominent location of the captioning for arena sports, accuracy and latency are of utmost importance.

Fig. 11: University of Notre Dame. View of integrated captions on the main videoboard in the school's Purcell Pavilion.
Photo courtesy of Scott Rinehart

University of South Carolina

Columbia, SC

William-Brice Stadium provides an optimal location below the main video display.

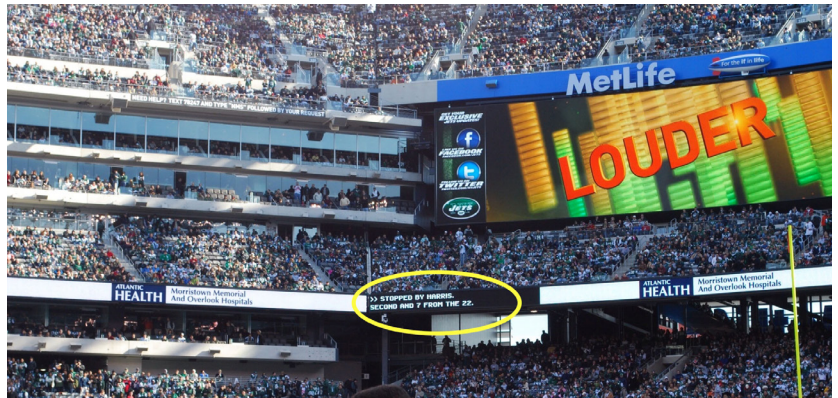*Fig. 12: Williams-Brice Stadium. View of dedicated captioning display.*

MetLife Stadium

East Rutherford, NJ

MetLife Stadium, home of the NFL Jets and Giants, provides two displays in opposite corners near the main videoboards.

Fig. 13: MetLife Stadium. View of one of two dedicated captioning displays. Photo courtesy of Jennifer Bonfilio

Miller Park

Milwaukee, WI

Miller Park, home of the Milwaukee Brewers, provides dedicated sections of fascia displays with a blue background.
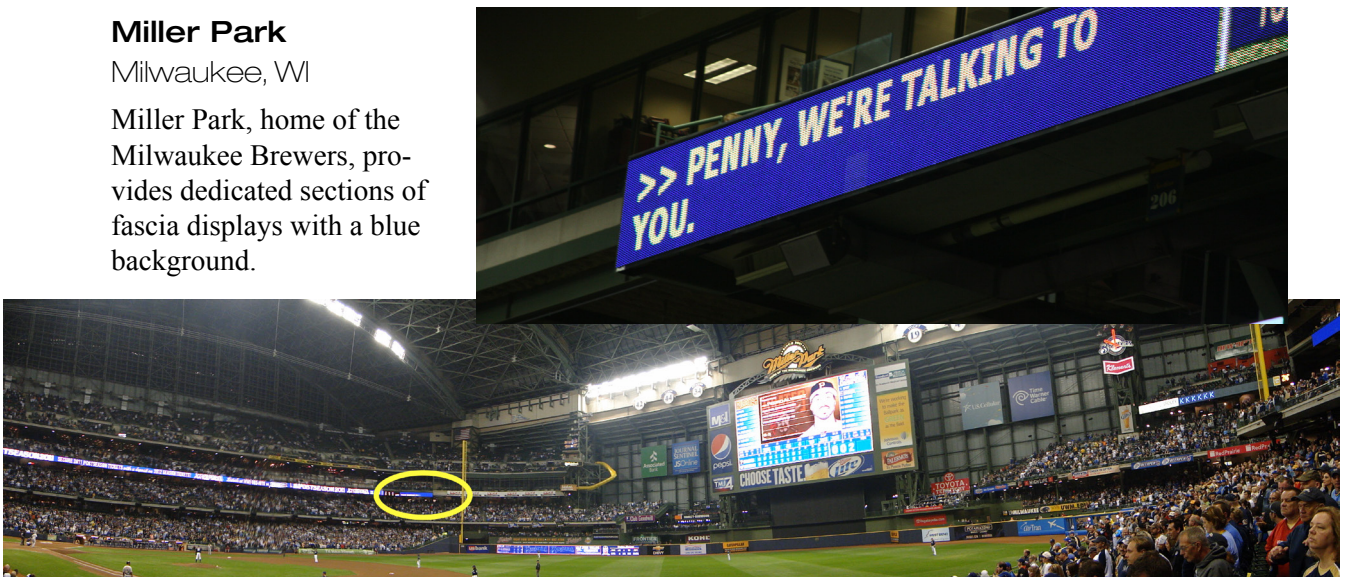

Fig. 14 and 15: Views of one of two dedicated display boards. Photo courtesy of WW Photos

E7. Conclusion

The intention of this paper is to provide a basis for understanding how to most effectively comply with closed-captioning regulations and provide an equal opportunity for deaf or hard-of-hearing attendees to fully enjoy the game presentation. By providing dedicated LED displays, installing the latest encoding technology, and contracting and engaging with an experienced sports captioner as part of the team, each venue can exceed compliance requirements and provide a great experience for all fans.

E8. Resources

Americans With Disabilities Act (ADA)

Title II: State and Local Governments
https://www.ada.gov/regs2010/titleII_2010/titleII_2010_regulations.htm

Title III: Public Accommodations and Commercial Facilities
https://www.ada.gov/regs2010/titleIII_2010/titleIII_2010_regulations.htm

Current and amended Department of Justice (DOJ) regulations concerning implementation of Title II and Title III
https://www.ada.gov/regs2010/ADAregs2010.htm

Rehabilitation Act of 1973

Section 504
https://www.dol.gov/oasam/regs/statutes/sec504.htm

Section 508
https://www.section508.gov/content/learn/laws-and-policies

Twenty-First Century Communications and Video Accessibility Act of 2012 (CVAA)
https://www.fcc.gov/general/twenty-first-century-communications-and-video-accessibili-ty-act-0