

## Soldier Field Ensures High Density Wi-Fi with Ventev Handrail Enclosures

### Executive Summary

#### Clients:

- Boingo Wireless
- Chicago Park District, Stadium Owner
- SMG Stadium Management

#### Client Challenge:

Ensure reliable, high-performance Wi-Fi throughout the lower bowl of the stadium

#### Product Solution:

##### Handrail Enclosures

Ventev's Handrail Wi-Fi Enclosure fits on any handrail in stadiums, arenas and other Large Public Venues (LPVs). The Handrail Enclosure houses two Cisco 3802e Access Points and two antennas flat against the center with each antenna pair facing in opposite directions. It provides an optimum solution to balance coverage and capacity throughout the stadium.

- Aesthetic design blends into environment
- Corrugated design enhances durability and provides additional impact protection
- Back to back antennas reduce RF interference



Stadium Handrail Enclosure  
for Cisco 3802e APs  
TESSCO No. 549590



Chicago's iconic Soldier Field is a multi-purpose stadium that hosts national and college football, world-class music concerts, international soccer, and other events that regularly fill its 60,000+ seats to capacity. Keeping all those fans connected to the network is a major priority, and an ongoing challenge.

Every year, more and more fans demand access to the stadium network, and the devices they are using require more and more bandwidth. Recently, SMG Stadium Management contacted Boingo, the stadium wireless network solutions provider, to see what they could do to improve coverage and increase capacity in the stadium.

#### Challenge

As with most stadiums, the lower bowl is the most difficult area to ensure high-performance, reliable Wi-Fi. High-density Wi-Fi networks are created by deploying access points connected to narrowband antennas to segment users into smaller cells that minimize channel-to channel interference. With fewer users per AP, the amount of bandwidth per user is increased and capacity is maximized. However, the front lower sections of users close to the field are difficult, if not impossible, to segment from APs and antennas mounted on the back walls or overhangs. Adding more APs won't help because of the interference they cause. To increase capacity in the lower bowl, network engineers must bring the access points and antennas closer to the fans.

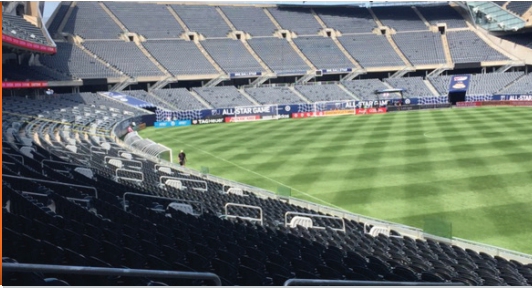
"We were faced with few known, tested options for getting good, close signal down in the bowl," said Keith Tucker, Boingo Wireless. "Complicating our analysis further was the timing of the rollout of the Cisco 3802, a new access point that was integral to Boingo's high capacity Wi-Fi network plan, but had not yet been deployed in the stands anywhere in the US, and not yet fitted to an enclosure by any manufacturer. With a referral from Cisco, we contacted Ventev, an engineering manufacturer of Wi-Fi infrastructure, to help us with a solution that would be compatible with the new access points."

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#### Solution

Ventev has a portfolio of stadium Wi-Fi solutions that address the challenges of ensuring capacity to high densities of fans. "We learned that Ventev had a Handrail Enclosure for Cisco 3700 series APs that housed access points in pairs," said Tucker. "We contacted them and their engineers were willing to work quickly with Boingo to get a dual-3802 prototype Handrail Enclosure to us as the project moved into the final design phase."

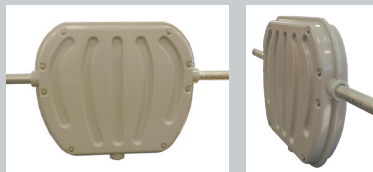
Ventev's unique Handrail Wi-Fi Enclosure deploys and protects two access points and two antennas to allow Wi-Fi connectivity to users in the sections on both sides of the aisle. Constructed of rugged, UV-resistant polycarbonate, it



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Handrail Enclosures were installed throughout the stadium



has a slim form factor that is aesthetically pleasing and ADA compliant. Ventev presented the Handrail Enclosure to the Boingo, SMG Stadium Management and Soldier Field project team. They were impressed with the aesthetics, and the quality of the enclosure. “We installed a few test units, and all questions and concerns were addressed satisfactorily, including concerns about rigidity and fading, clearances and ADA compliance,” said Tucker. “Ventev was given the order for the entire stadium.”

The biggest installation challenges came from the irregularities in the structure of the stadium. “There were varying thicknesses of handrails. We were unable to remove the handrails to either pull cable through, or core drill a bottom-fed pair of data cables without some offset and angle,” said Tucker. “Also, there were different pitches of stairs in different levels of the stadium, and poured-in-place steps in between cast steps, and extensive support beams below. We worked with Ventev to make some modifications to the enclosures, minor one-inch wedge cuts to the bottom flange of the enclosures, to accommodate a few steep sections of the stadium.”

The installation of all 275 Handrail Enclosures was completed on schedule. “The Ventev enclosure allowed Boingo to deploy Wi-Fi in both directions from the aisles, at waist height, not from under the seats, and Boingo believes this has allowed the RF signal to penetrate the middle of the rows better, where body absorption of crowds in an outdoor stadium is a strong design constraint,” said Tucker.

### Outcome

The owners of Soldier Field were very happy with the solution. “Soldier Field posed a variety of challenges in retrofitting the stadium with a high-capacity Wi-Fi network,” said Luca Serra, SMG Stadium Management Services. “Boingo and Ventev developed a unique product solution that met all of our goals to keep infrastructure unobtrusive, follow local ordinances, and meet the capacity targets.

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We are extremely pleased with the outcome of the overall network and how it aesthetically blends with the stadium.”