

How External Antennas Can Improve Your Large Public Venue



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What Types of LPV?

- Stadiums/Arenas
 - Open-Air
 - Enclosed
- Convention Centers

Stadiums and Arenas



Open-Air



Enclosed

Stadiums and Arenas

Design Methodologies



Under Seat



Overhead

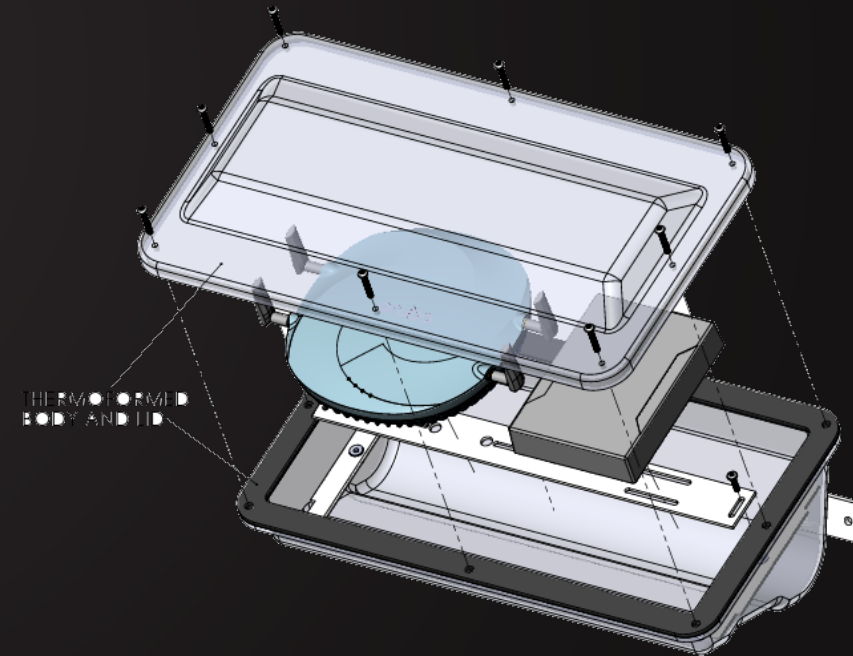
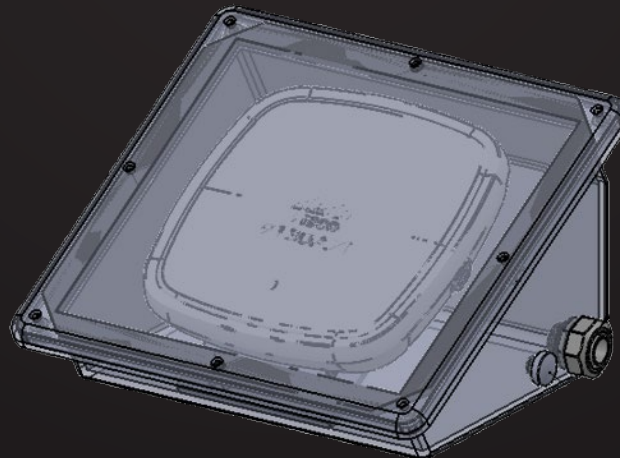
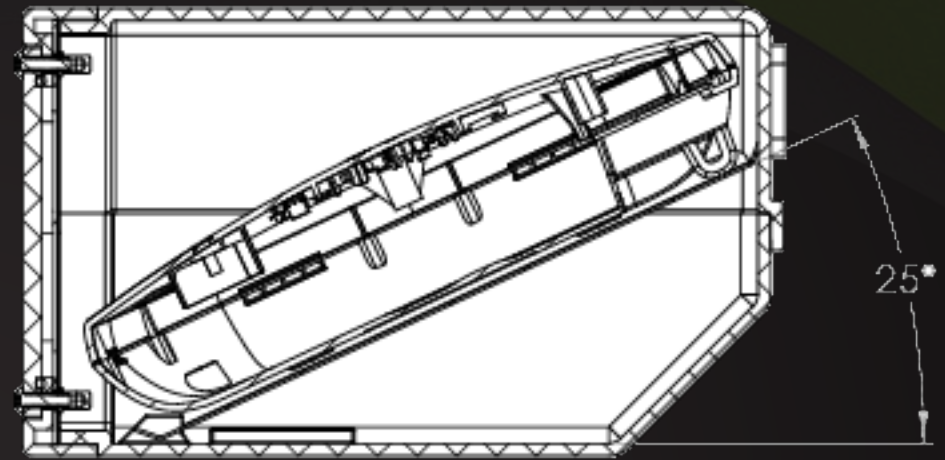


Handrail

Stadiums and Arenas

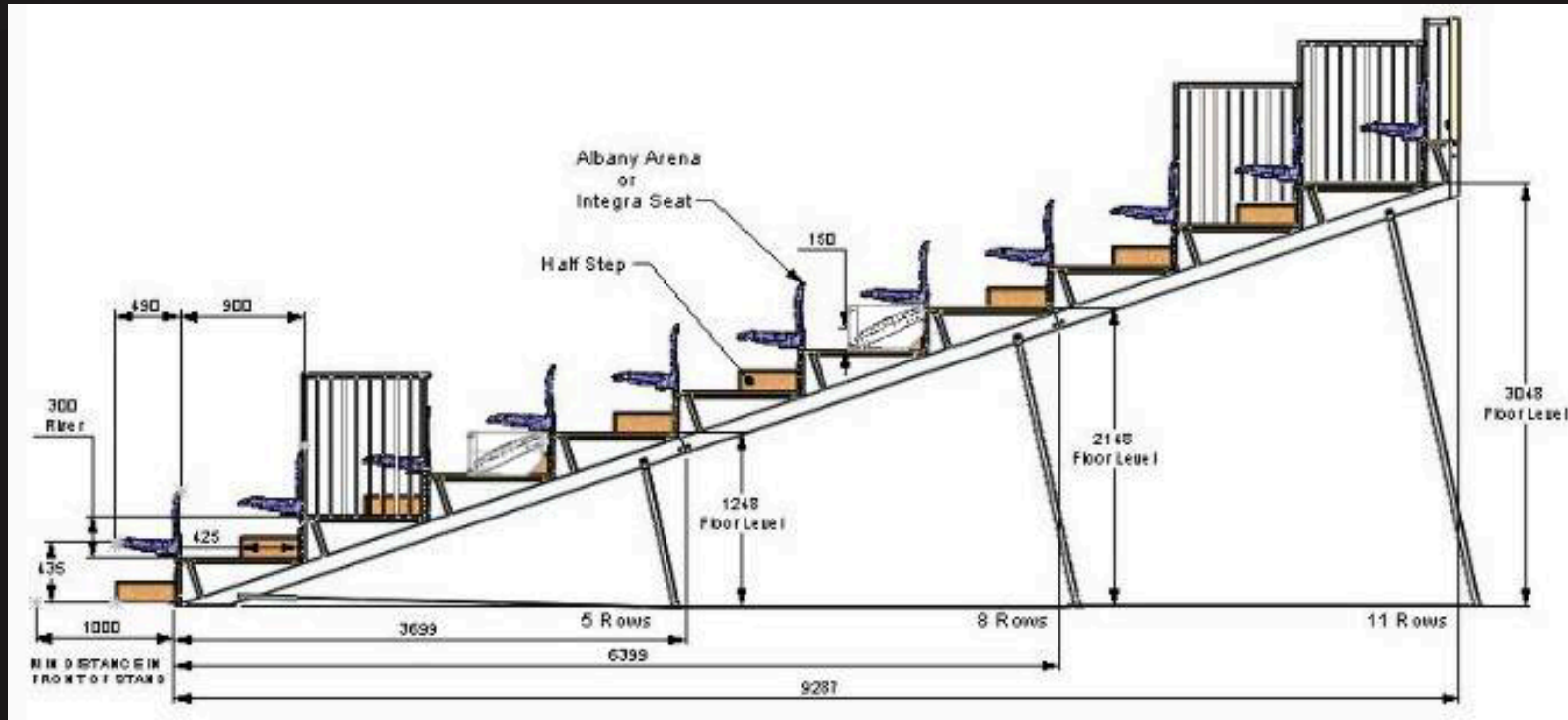
Under Seat

- Best Open-Air Solution
- Coverage Changes Depending On Attendance
- Low Profile Aesthetics And Easier Maintenance
- Typically Allows For More Channel Reuse (In Open-air)
- Every Under Seat Is Different



Stadiums and Arenas

Under Seat



Stadiums and Arenas

Under Seat - Design

Radio 2

Band: ax

Channel: 157

Power (EIRP: 17.3 dBm): 12 dBm

Height: 0 ft

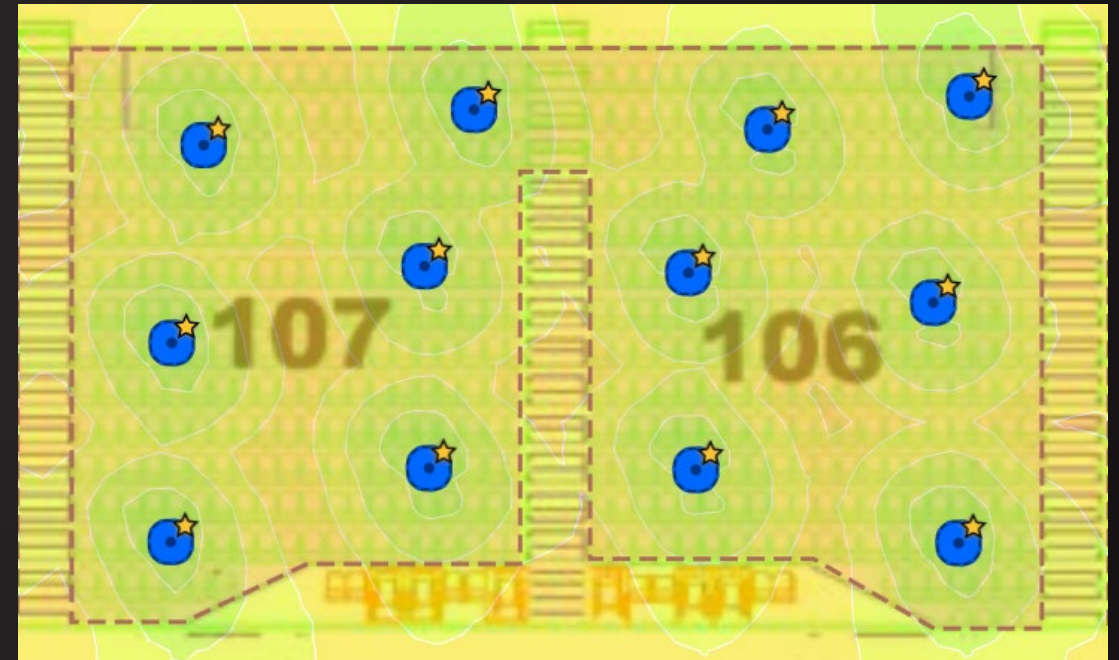

Spatial Streams: 4

Short Guard ...

Antenna / Tilt

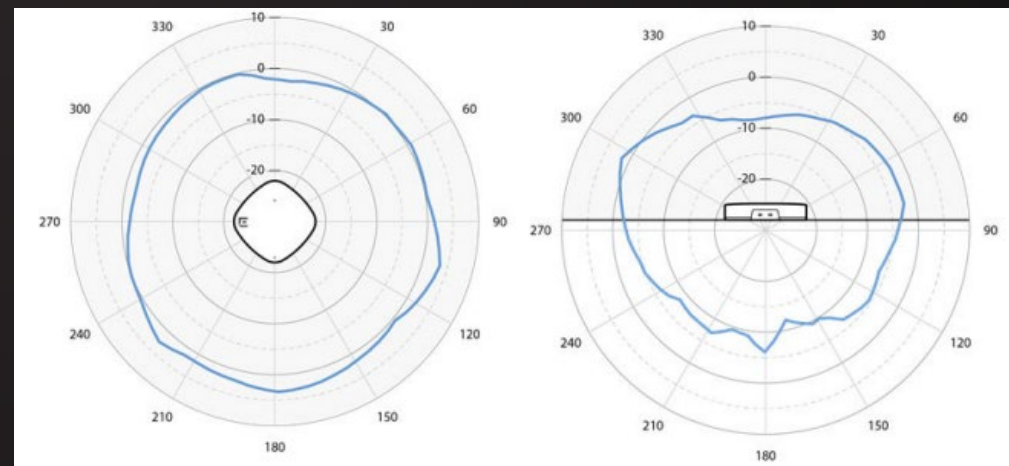
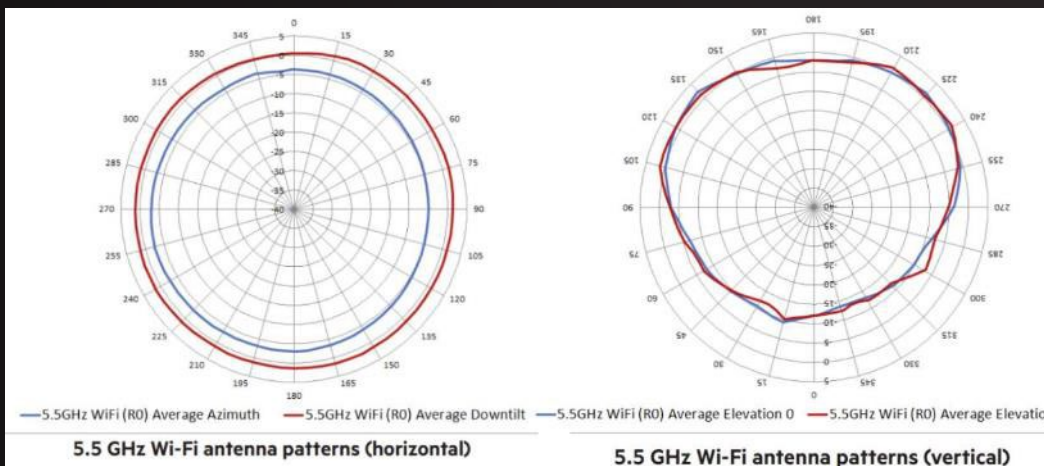
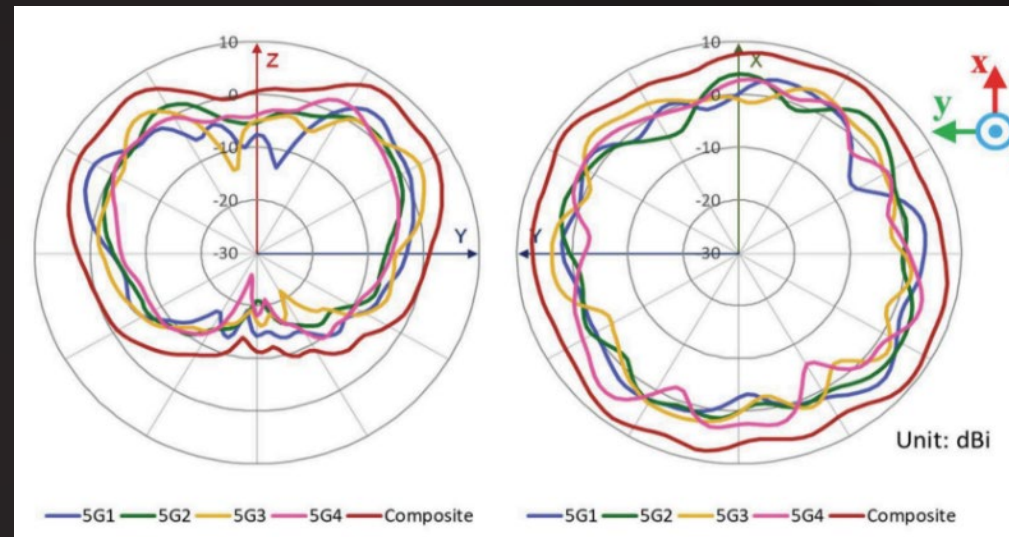
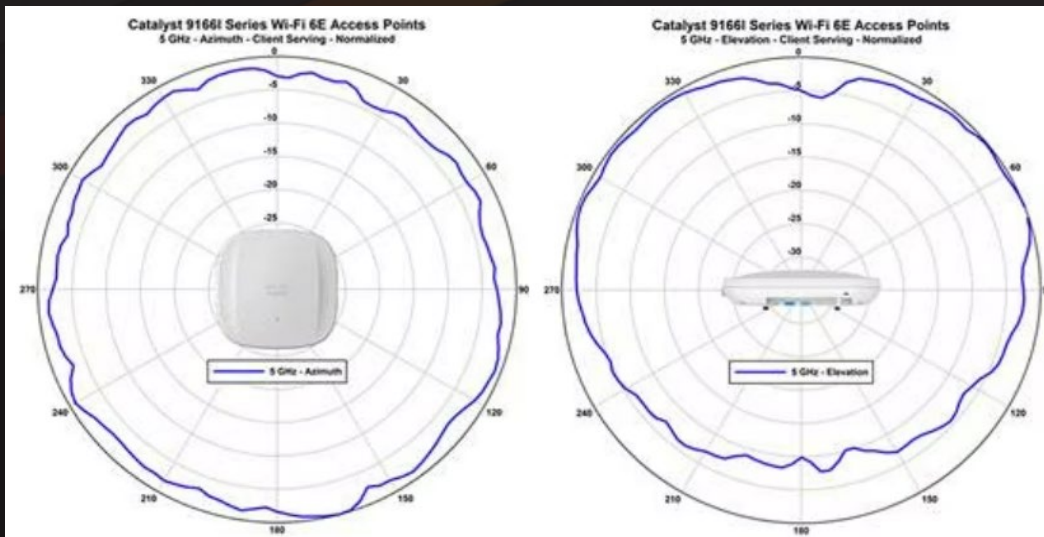
Aruba AP-655 5GHz

0 °



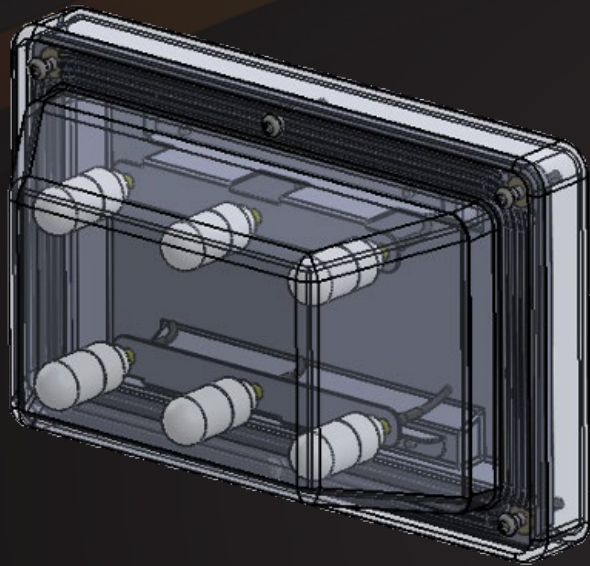
Stadiums and Arenas

Under Seat – Internal Downtilt



Stadiums and Arenas

Under Seat



Radio 2

Band: ax

Channel: 132

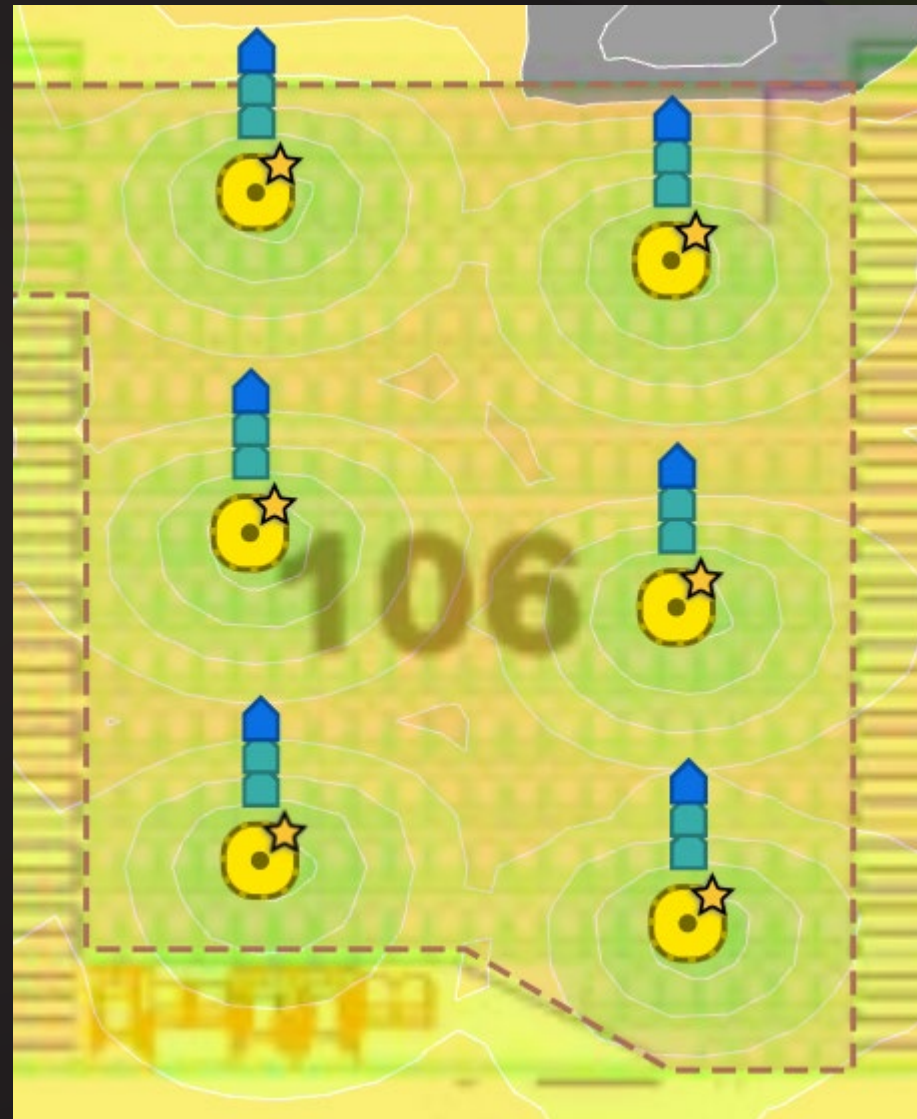

Power (EIRP: 17.18 dBm): 15 dBm

Height: 1 ft

Spatial Streams: 4

Short Guard ...

Antenna / Tilt: AccelTex ATS-IDSD-245-23-1RPS...



Stadiums and Arenas

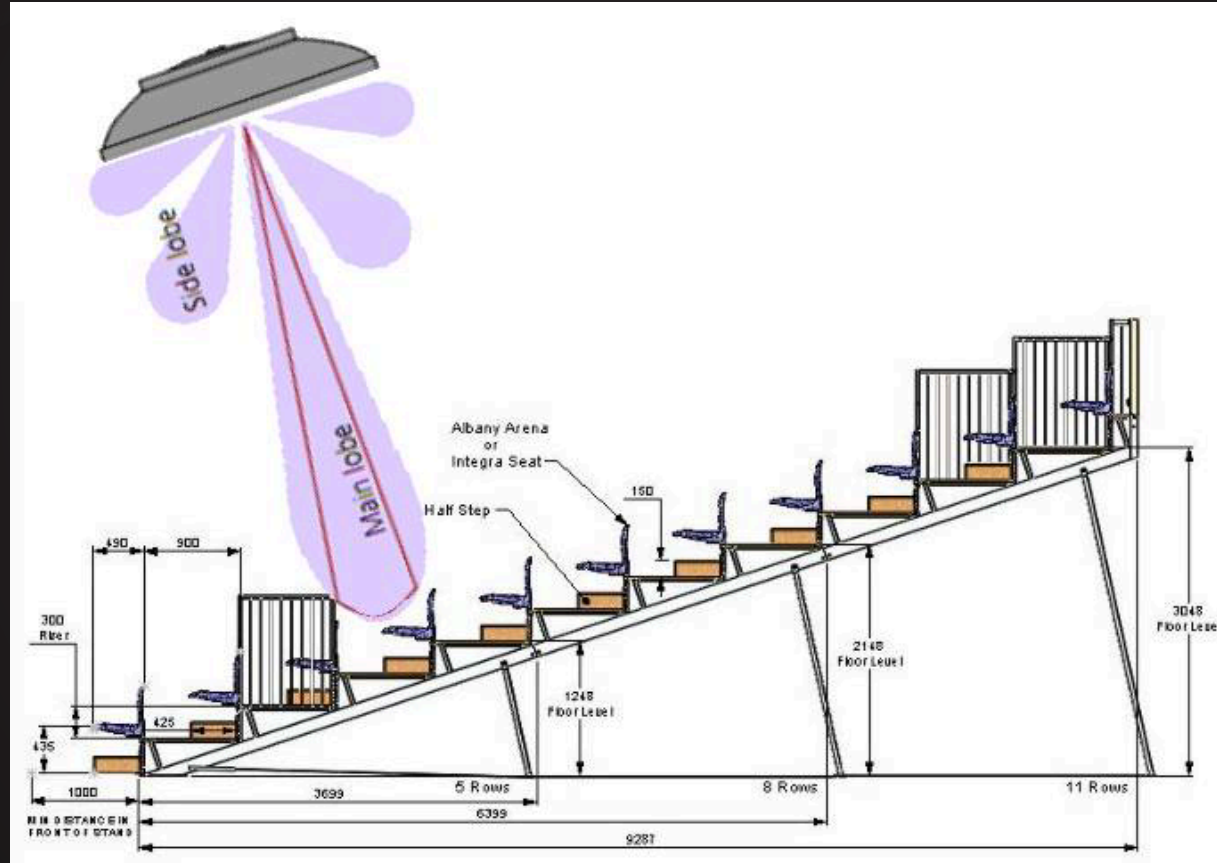
Overhead

- Best Enclosed Solution
- Coverage Isn't Dependent On Attendance
- Cleaner Aesthetics (Non-visible) But Harder Maintenance
- Typically See More Reflectance (In Enclosed Arenas)



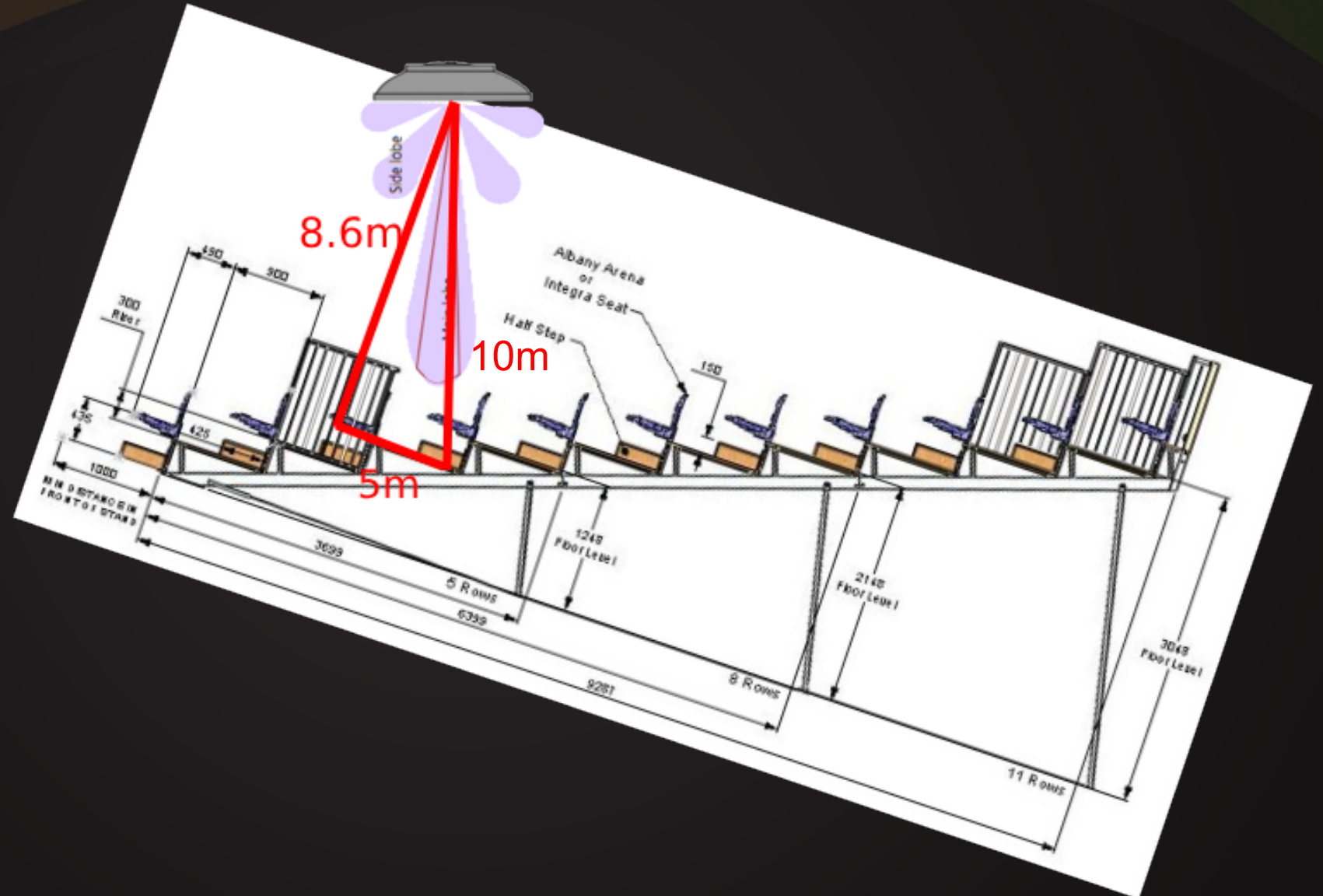
Stadiums and Arenas

Overhead



Stadiums and Arenas

Overhead - Trig



Stadiums and Arenas

Overhead



Radio 2

Band: ax

Channel: 56

Power (EIRP: 19.7 dBm): 10 dBm

Height: 25 ft

Spatial Streams: 4

Short Guard Interval:

Antenna / Tilt: Cisco C-ANT9104_Slot1_Narrow ...

Radio 2

Band: ax

Channel: 136

Power (EIRP: 20.26 dBm): 8 dBm

Height: 25 ft

Spatial Streams: 4

Short Guard Interval:

Antenna / Tilt: AccelTex ATS-0HDP-245-1312-6...

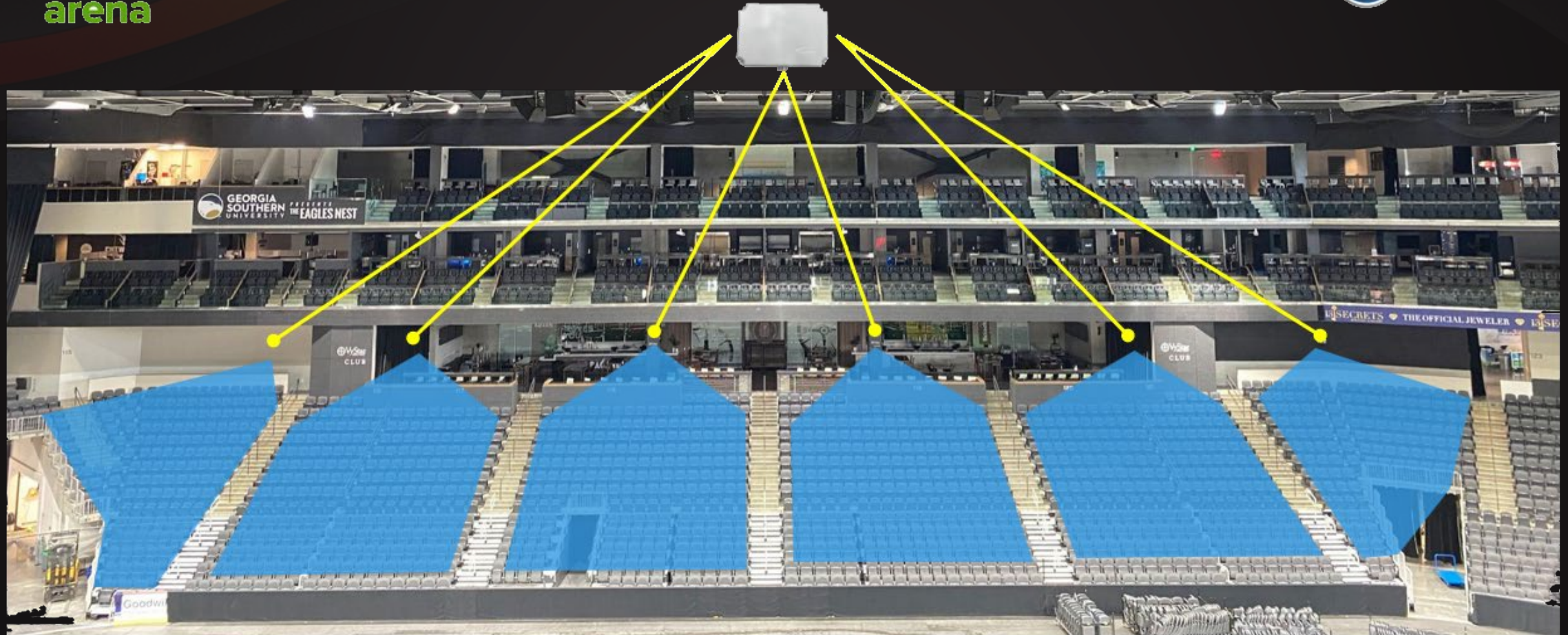
Stadiums and Arenas

Overhead - Outdoor



Stadiums and Arenas

Overhead - Outdoor



Stadiums and Arenas

Handrail

- Usable For Both Open-air And Enclosed Solution
- Coverage Changes Depending On Attendance
- Low Profile Aesthetics And Easier Maintenance
- Every Handrail Is Different
- ADA/EDA Concerns



Stadiums and Arenas

Handrail



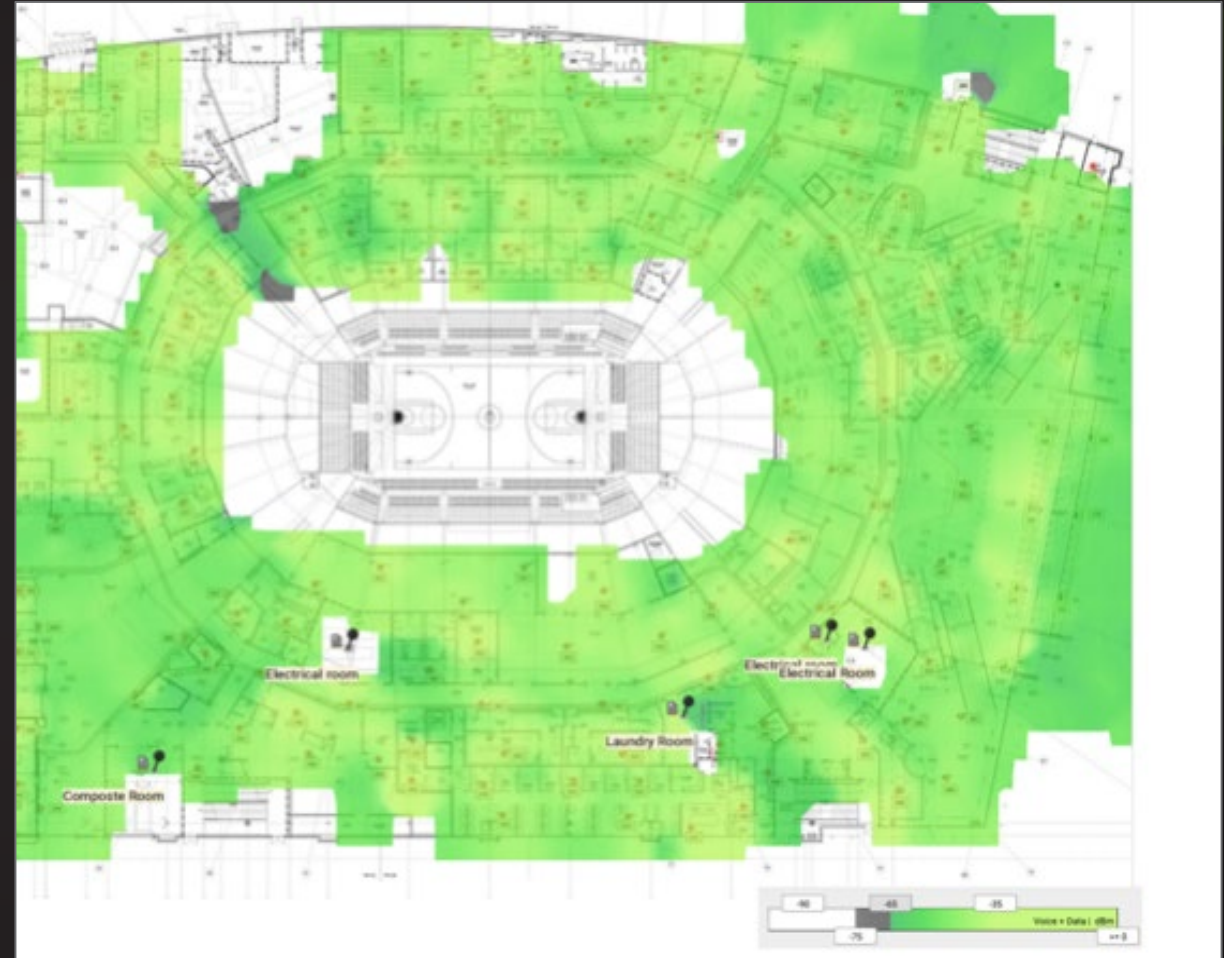
Enclosure Interior



Bi-Directional
Handrail Antenna



Custom Enclosure w/
Antennas Inside



Stadiums and Arenas

Survey!!!



Convention Centers

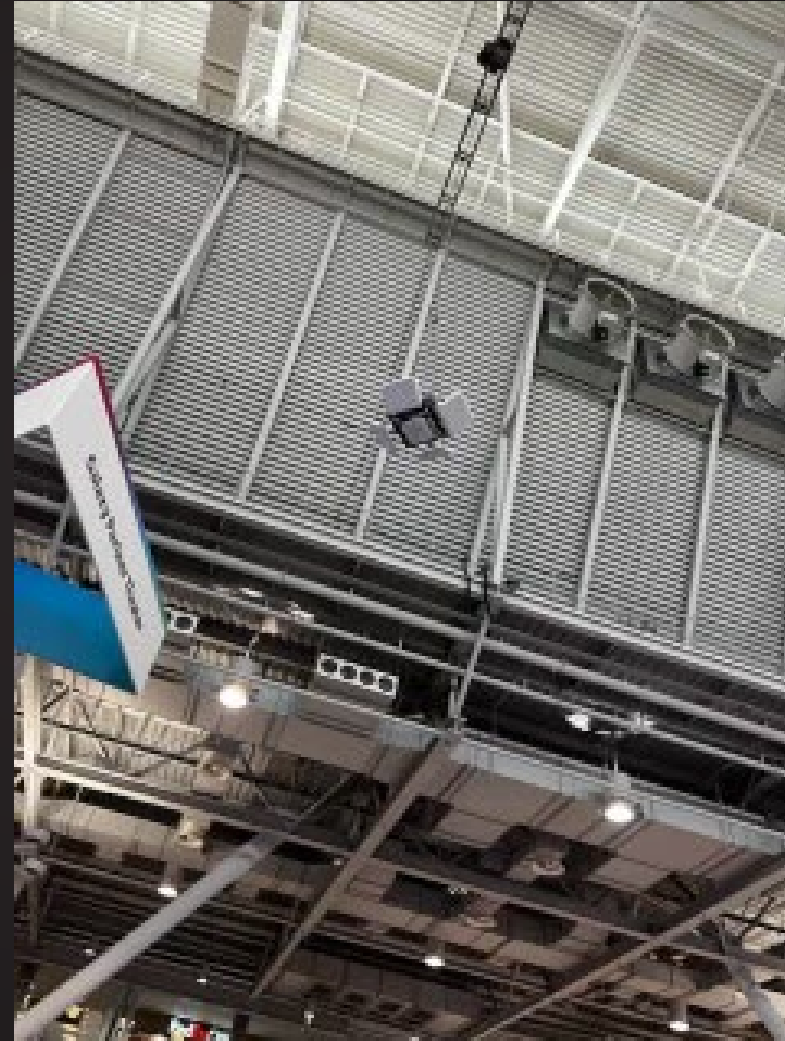
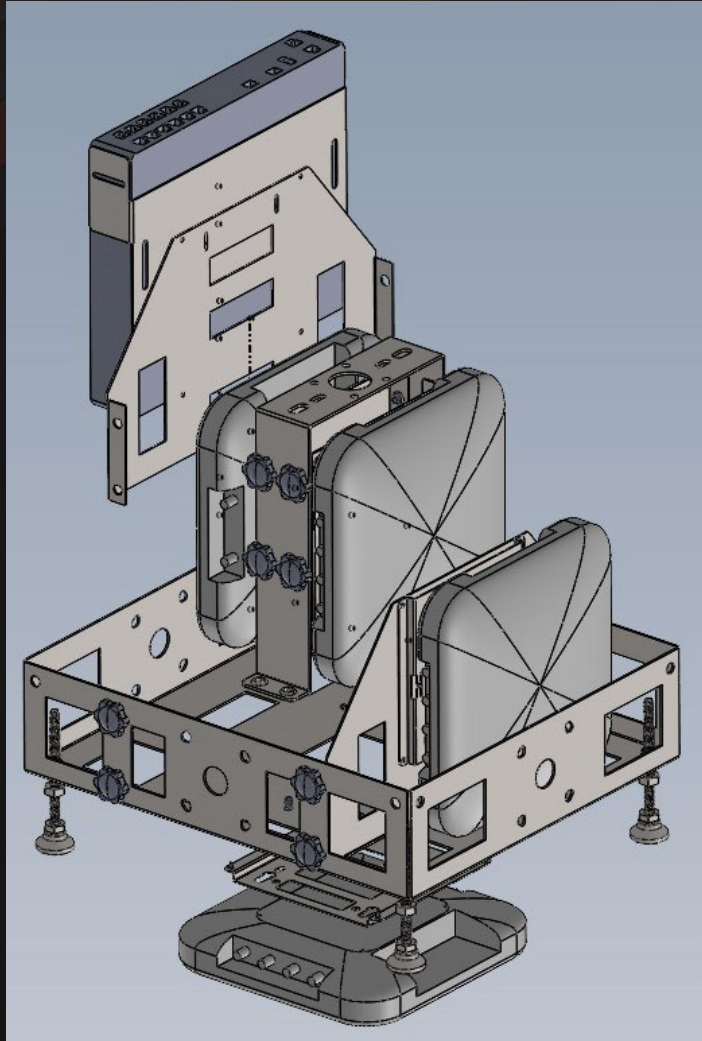


Convention Centers

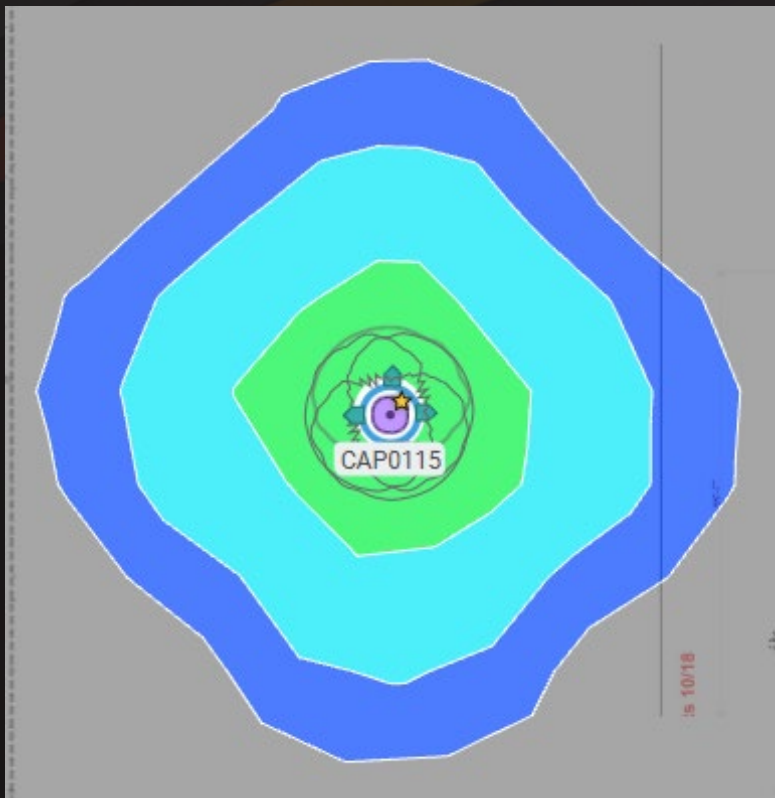
- High-Density
- Mobile
- High Aesthetic Requirements
- Typically* Higher Average Use
But Lower Peak Use
- Rogue APs



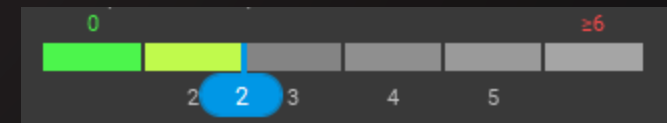
Convention Centers



Convention Centers



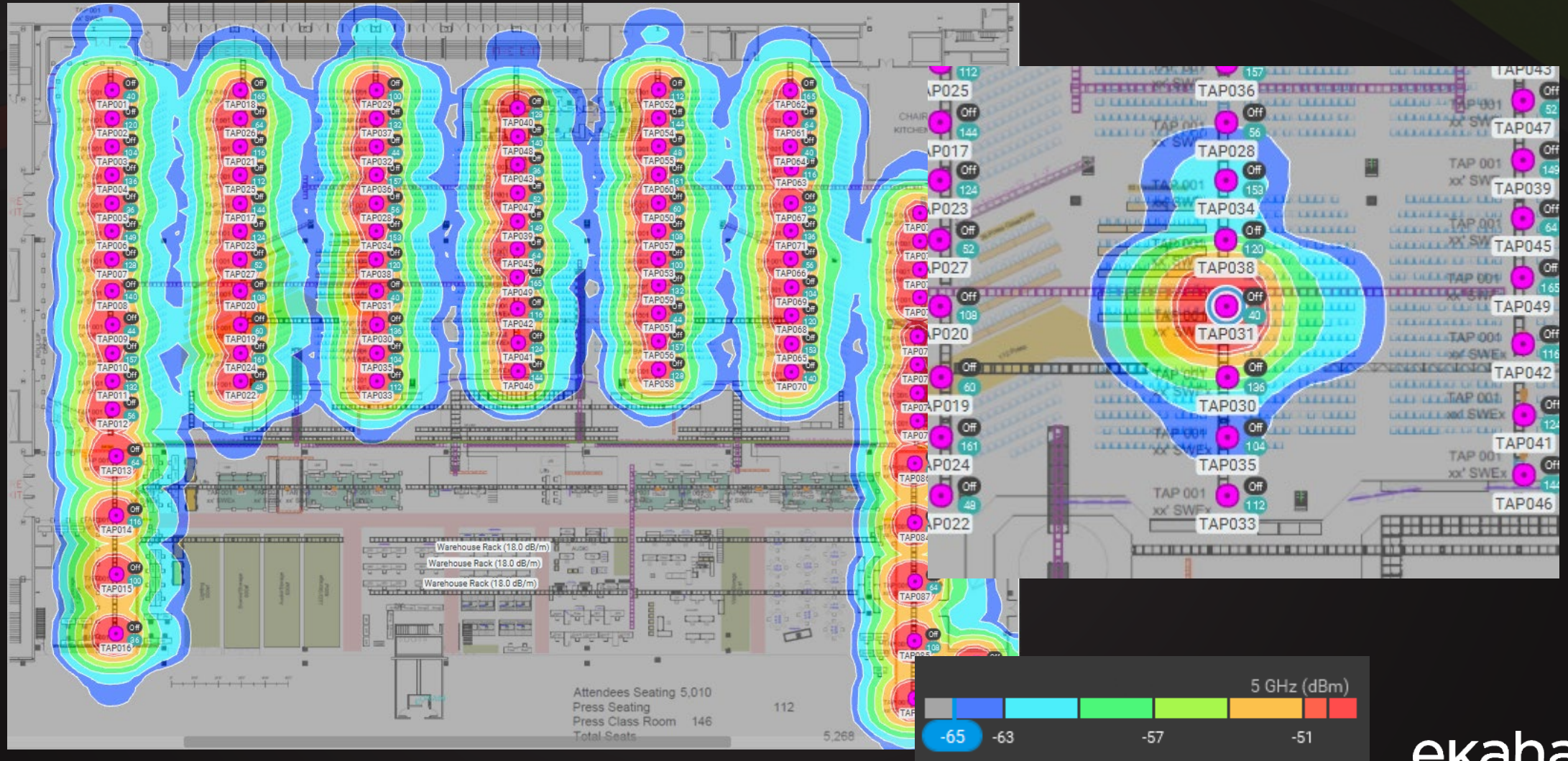
4 APs



Convention Centers

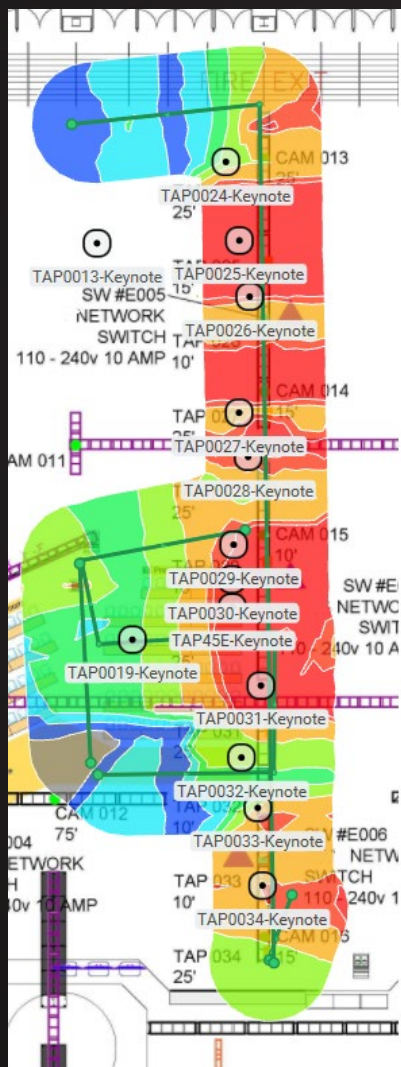


Convention Centers

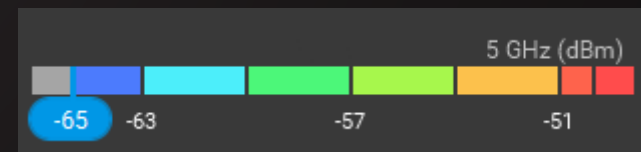
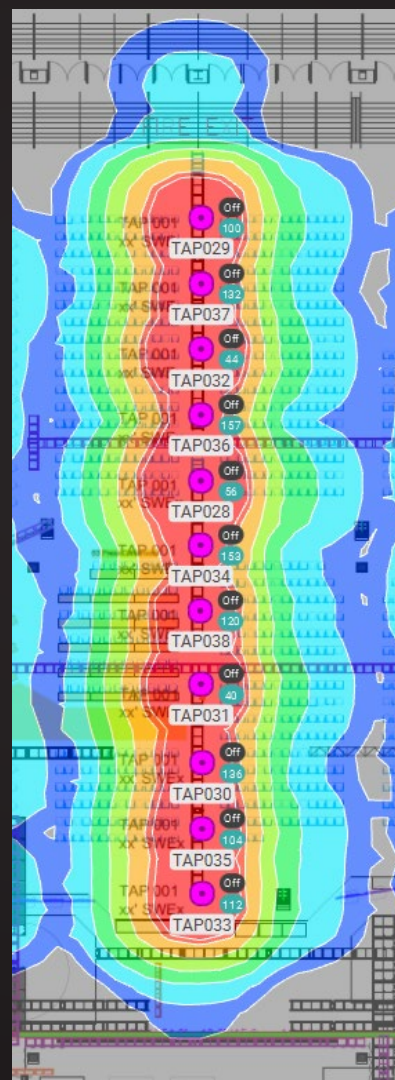


Convention Centers

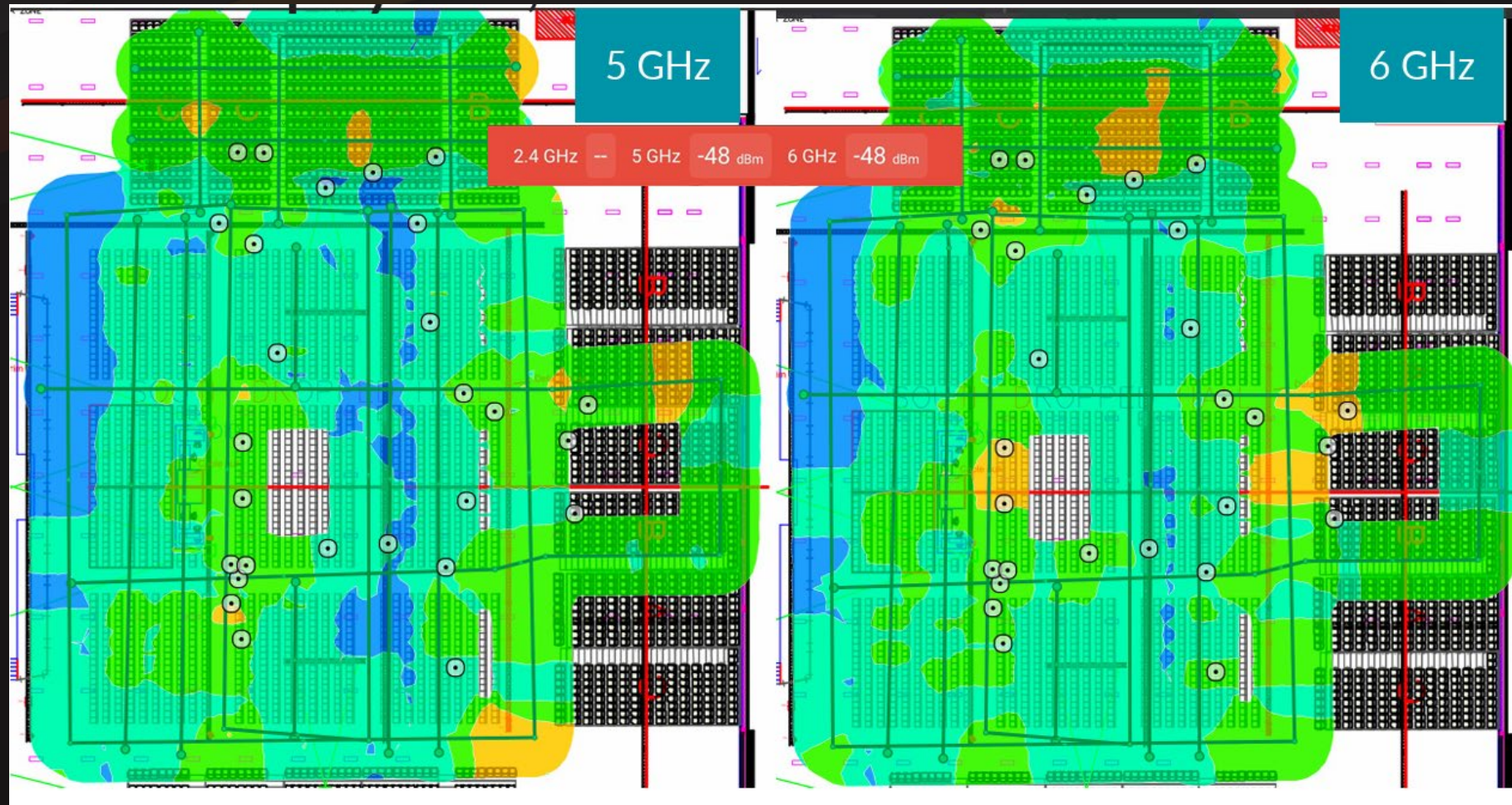
Survey



Predictive



Convention Centers



Thank You!



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AccelTex Solutions

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