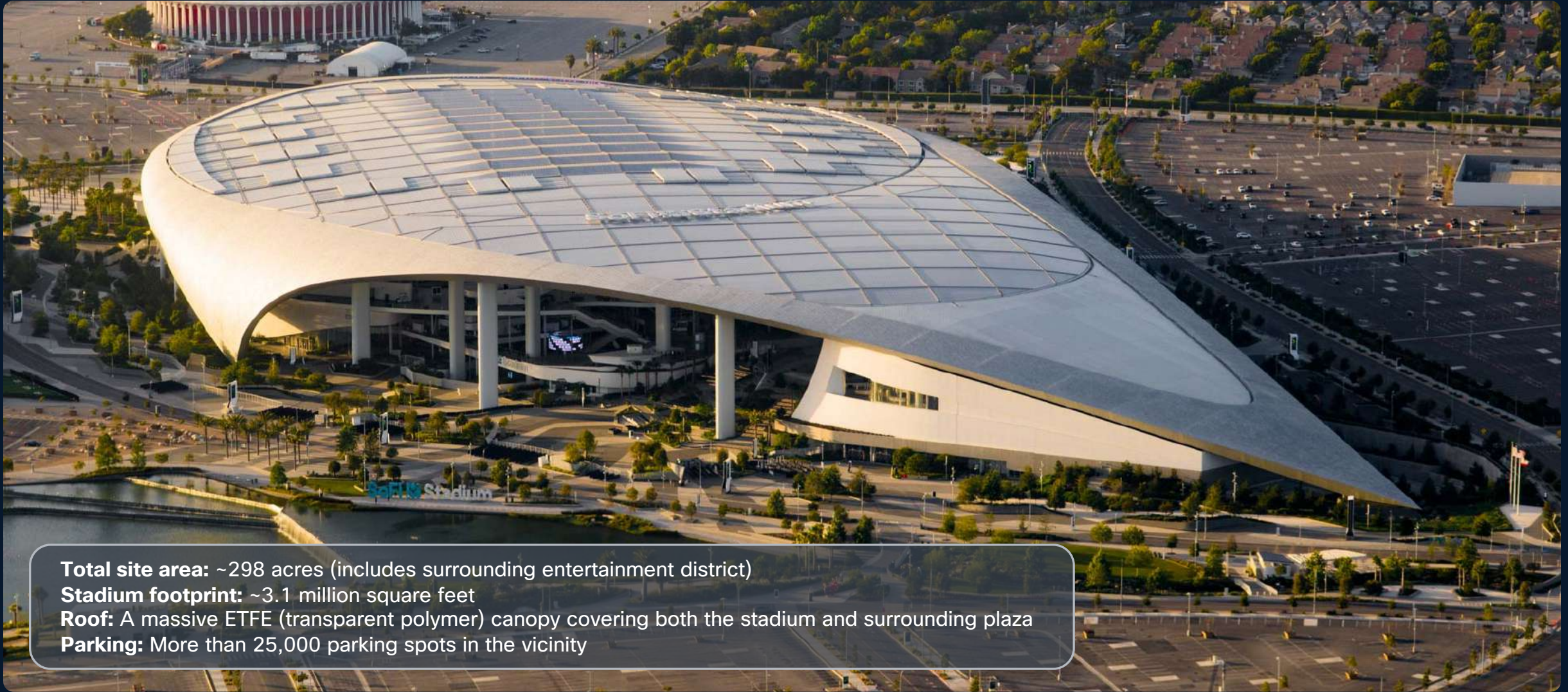# Stadium Convergence

DSA Global Summit

Matt MacPherson
Wireless CTO
Cisco Networking Group

November 2025

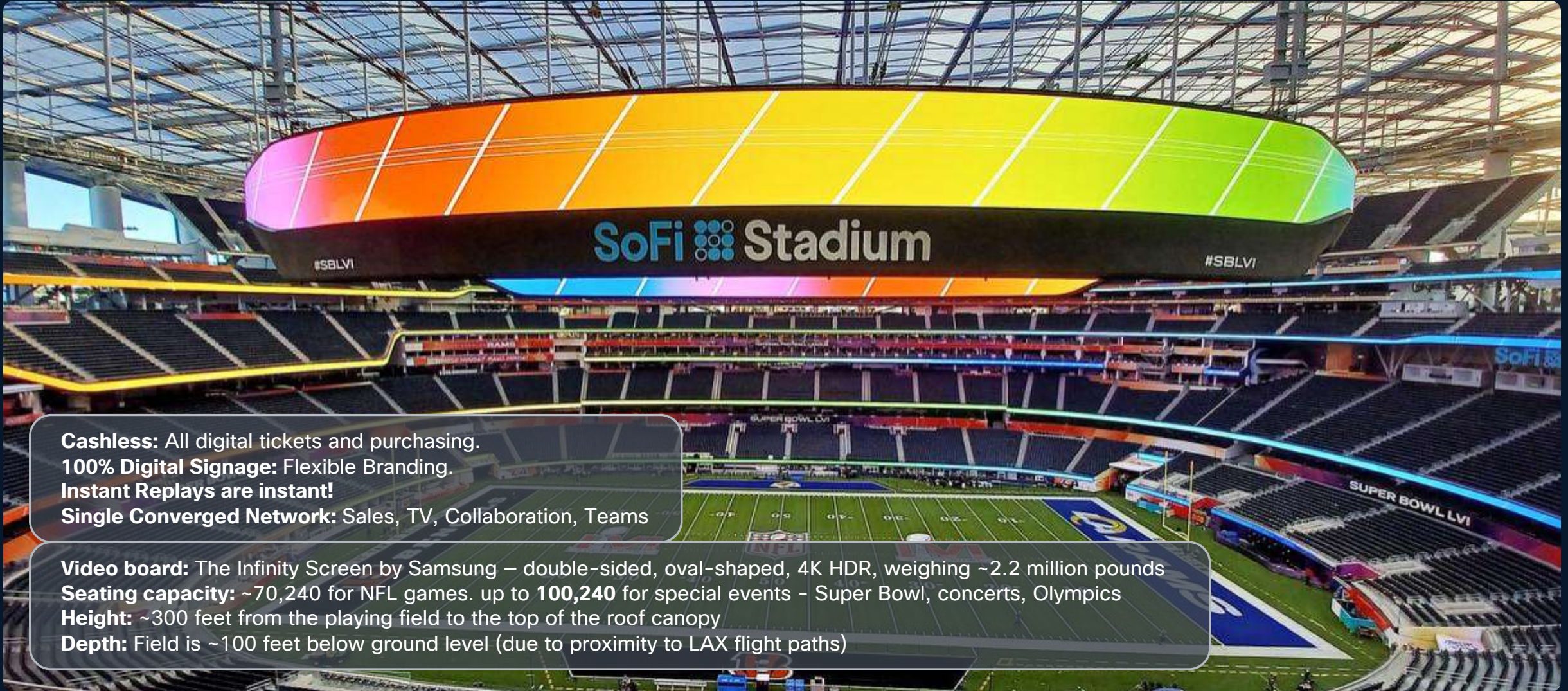# SoFi Stadium

Total site area: ~298 acres (includes surrounding entertainment district)
Stadium footprint: ~3.1 million square feet
Roof: A massive ETFE (transparent polymer) canopy covering both the stadium and surrounding plaza
Parking: More than 25,000 parking spots in the vicinity

SoFi Wi-Fi

Cashless: All digital tickets and purchasing.
100% Digital Signage: Flexible Branding.
Instant Replays are instant!
Single Converged Network: Sales, TV, Collaboration, Teams

Video board: The Infinity Screen by Samsung — double-sided, oval-shaped, 4K HDR, weighing ~2.2 million pounds
Seating capacity: ~70,240 for NFL games. up to **100,240** for special events - Super Bowl, concerts, Olympics
Height: ~300 feet from the playing field to the top of the roof canopy
Depth: Field is ~100 feet below ground level (due to proximity to LAX flight paths)

Intuit Dome – Clippers
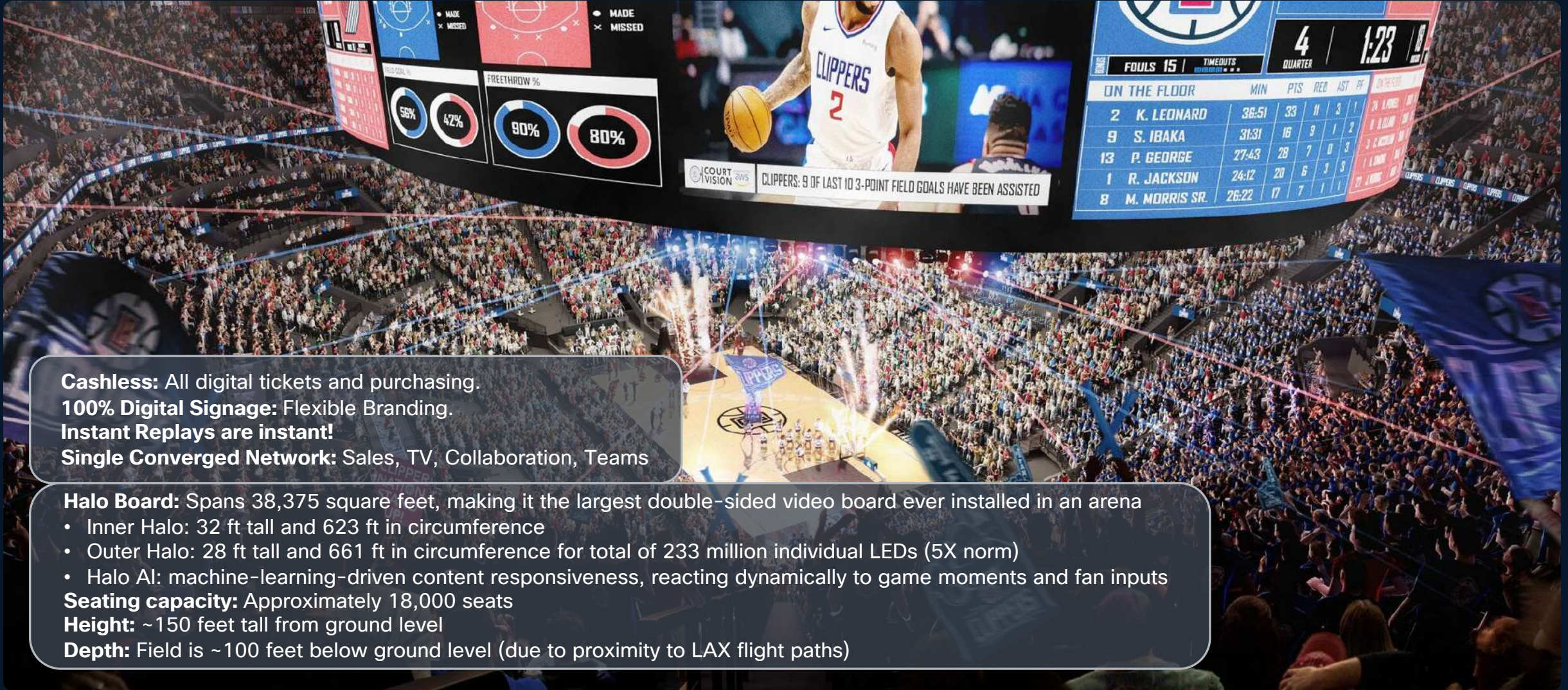

Total site area: The arena sits on a 28-acre parcel
Stadium footprint: ~1.25 million square feet, making it an expansive, multi-purpose complex
Retail & Plaza Space: Retail ~63,000 sq ft; Outdoor plaza includes additional courts and spaces
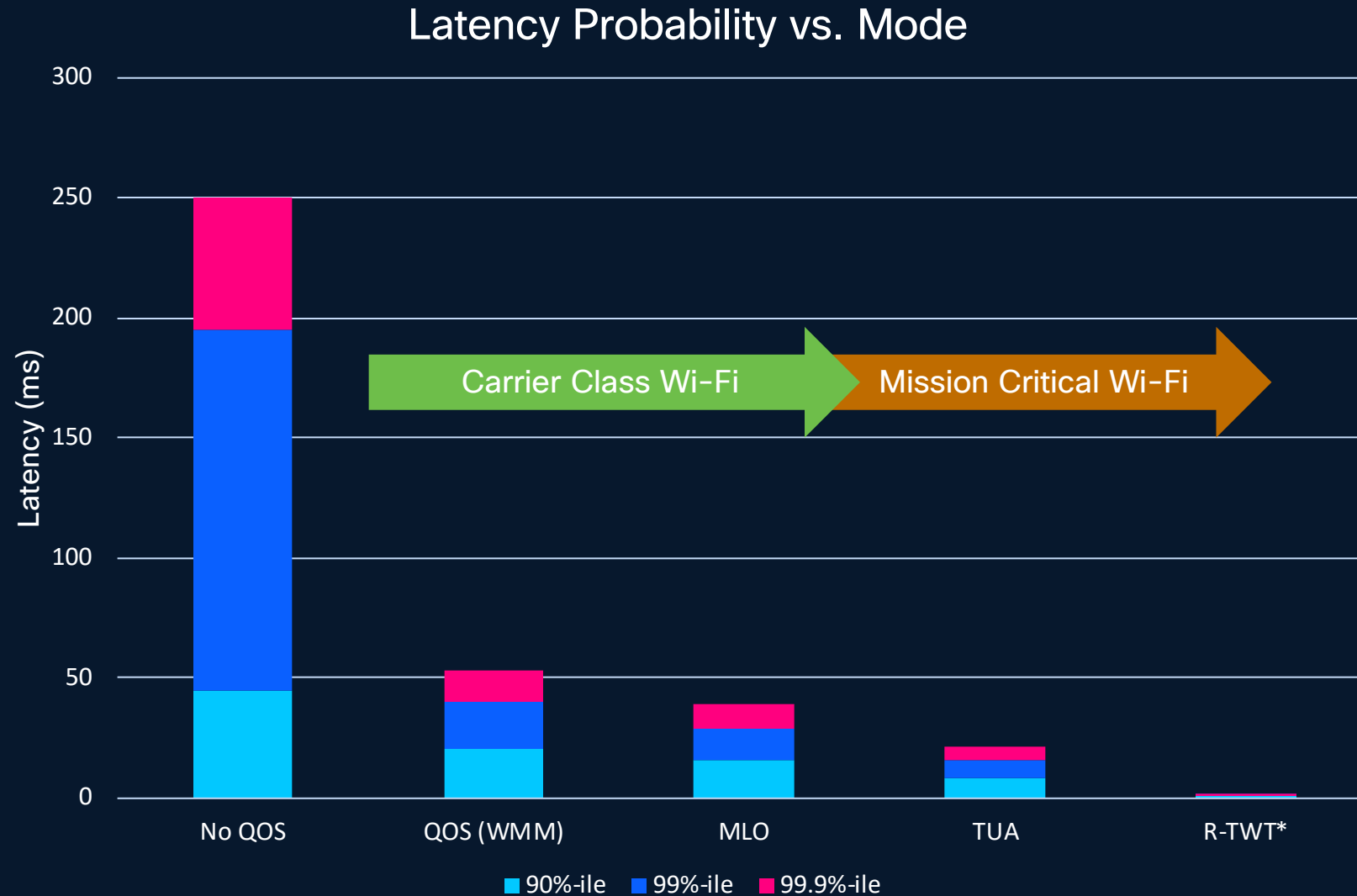**Parking:** More than 4,000 parking spots on site

Intuit Dome – Wi-Fi 6E
Combined 6GHz Omni with 5GHz Directional

Cashless: All digital tickets and purchasing.
100% Digital Signage: Flexible Branding.
Instant Replays are instant!
Single Converged Network: Sales, TV, Collaboration, Teams

Halo Board: Spans 38,375 square feet, making it the largest double-sided video board ever installed in an arena
- Inner Halo: 32 ft tall and 623 ft in circumference
- Outer Halo: 28 ft tall and 661 ft in circumference for total of 233 million individual LEDs (5X norm)
- Halo AI: machine-learning-driven content responsiveness, reacting dynamically to game moments and fan inputs

Seating capacity: Approximately 18,000 seats
Height: ~150 feet tall from ground level
Depth: Field is ~100 feet below ground level (due to proximity to LAX flight paths)

Wi-Fi 7 Determinism → 5/6G Convergence Ready

Latency Probability vs. Mode

Carrier Class Wi-Fi → Mission Critical Wi-Fi

Y-axis: Latency (ms) — 0, 50, 100, 150, 200, 250, 300

X-axis categories: No QOS, QOS (WMM), MLO, TUA, R-TWT*

Legend: ■ 90%-ile ■ 99%-ile ■ 99.9%-ile

Directional AP/Antenna Selection
Segmenting RF

	AP/Antenna	Beamwidth	Approx. Distance
	Integrated AP + Directional Antenna CW9166D1 (WiFi 6E) / Indoor *Cloud- or On-Prem-managed*	2.4: 70° 5GHz: 70° 5GHz XOR : 60° 6GHz: 60°	15'/5m – 30'/10m from AP to clients
	Integrated AP + Directional Antenna CW9176D1 (WiFi 7) / Indoor *Cloud- or On-Prem-managed*	2.4: 80° 5GHz: 70° 6GHz: 70°	15'/5m – 30'/10m from AP to clients
	Dual-Band "Wide" Patch Antenna **AP: 9120AXE/P, 9130AXE** **Antenna: AIR-ANT2566P4W-R**	2.4GHz: 105/70 ° 5GHz: 125/60°	< 30' / 10m from AP to clients
	Integrated AP + Antenna: High Gain CW9179F / Indoor or Outdoor* *Cloud- or On-Prem-managed*	2.4GHz: 70° 5/6GHz: 70x35 (Wide) 5/6GHz: 35x35 (Narrow)	Primary overhead coverage (i.e. seating areas / conference halls; <u>**> 30'/10m, <200'/60m to clients**</u>

IBOEWN-2003   *Outdoor CW9179F installation requires separate Environment Pack*

Industry's first Wi-Fi 7 access point for large venues

4th-Generation Hyper-directional AP

Wi-Fi that reaches everywhere

Wi-Fi 7 speed and performance for everyone in the audience and more

Designed for every venue

Indoor/Outdoor, concourse-ready and multi-use all-in-one, integrated access point

Configurable and flexible installation

Comprehensive coverage to get the best value from your install

On-Prem or Cloud-Managed

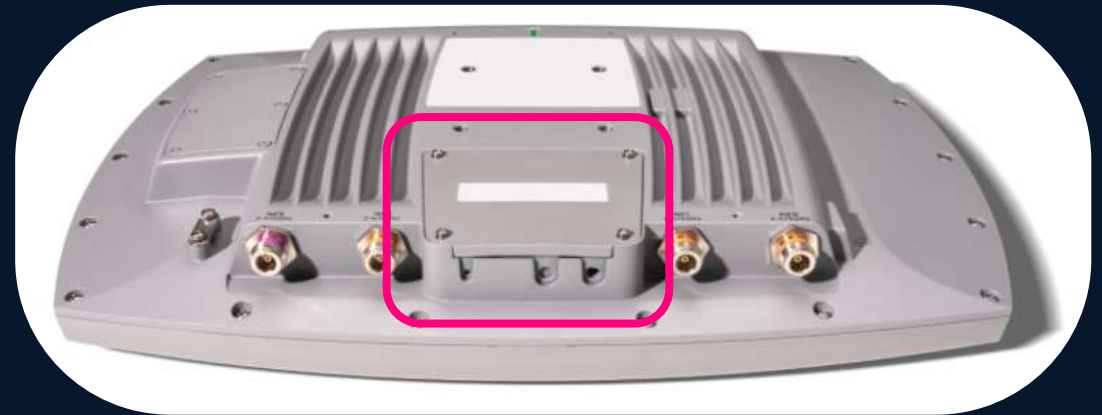One PID, flexible management options

CW9179F

CW9179F – Indoor & Outdoor Usage
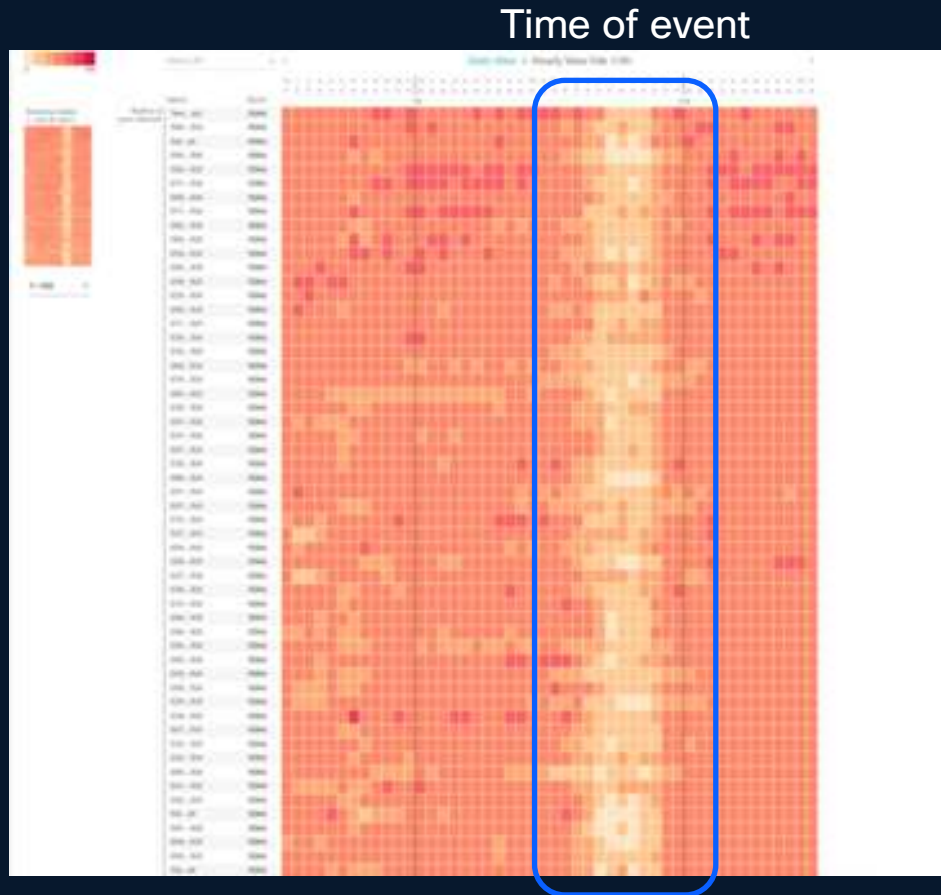
Indoor Deployment / LPI Mode
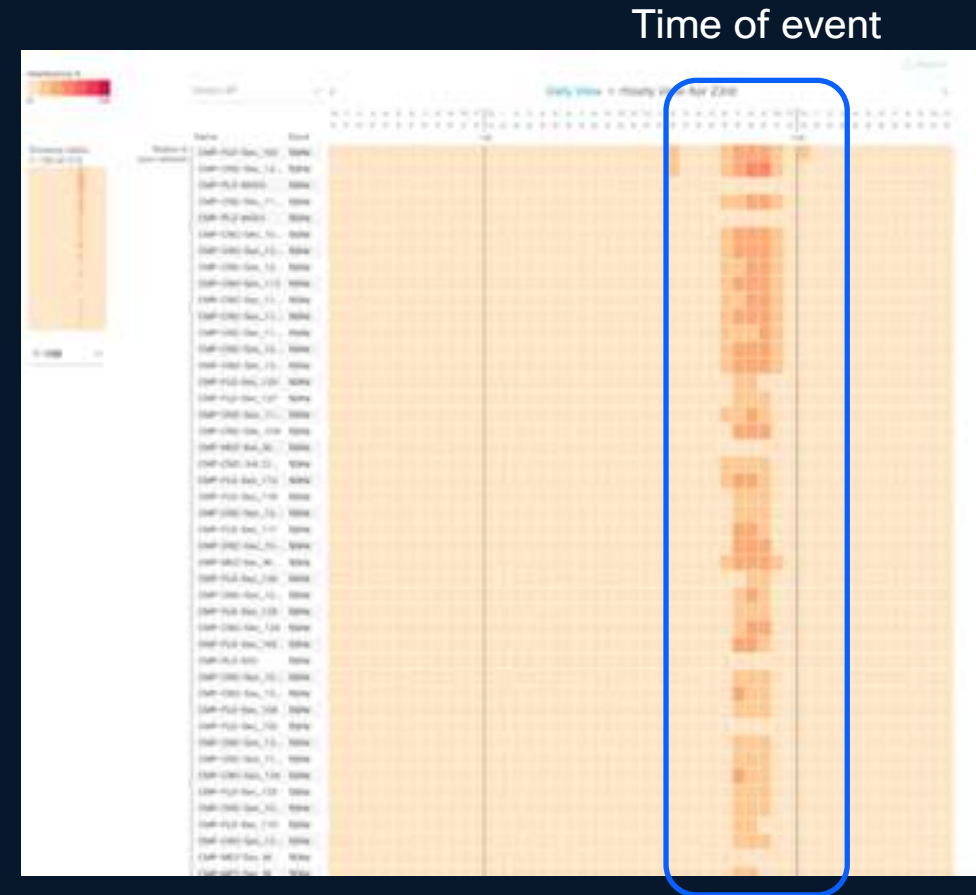
Outdoor Deployment / SP Mode
(with Environment Pack)

Environment Pack: Weatherizes & Signals to AP that it is Standard Power only

Performance Comparison: Overhead / Under-Seat

Time of event

Time of event

Under Seat / Omni

Overhead/Directional

Red = High Co-Channel Interference (CCI) / Poor Performance

CW9179F: BottleRock (Napa Valley Music Festival)
Wi-Fi 7 + Standard Power + AFC + OpenRoaming

OpenRoaming
Converging Identity for Universal Access

Access

Federation

Identity

Guest & Public ANPs

Seamless onboarding of indoor users.
Act on insights and extend business outcomes.

MNO & SP IDPs

Visibility of users when auth. on indoor networks.
Delivering cost effective indoor coverage.

90%
of our time is spent indoors

Users/Things

>85%
of mobile data is consumed indoors

Seamless and secure indoor connectivity.
Built-in privacy protection.
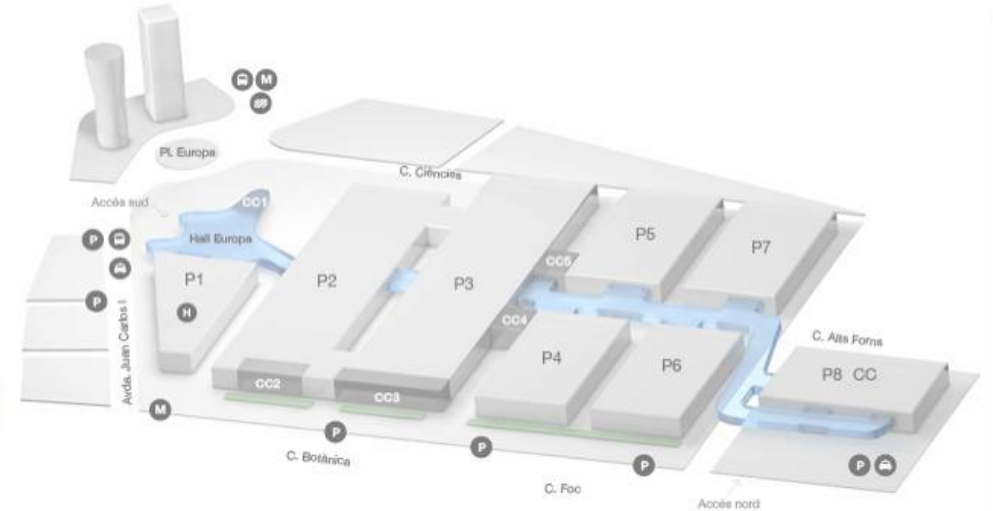
Mobile World Congress (MWC)
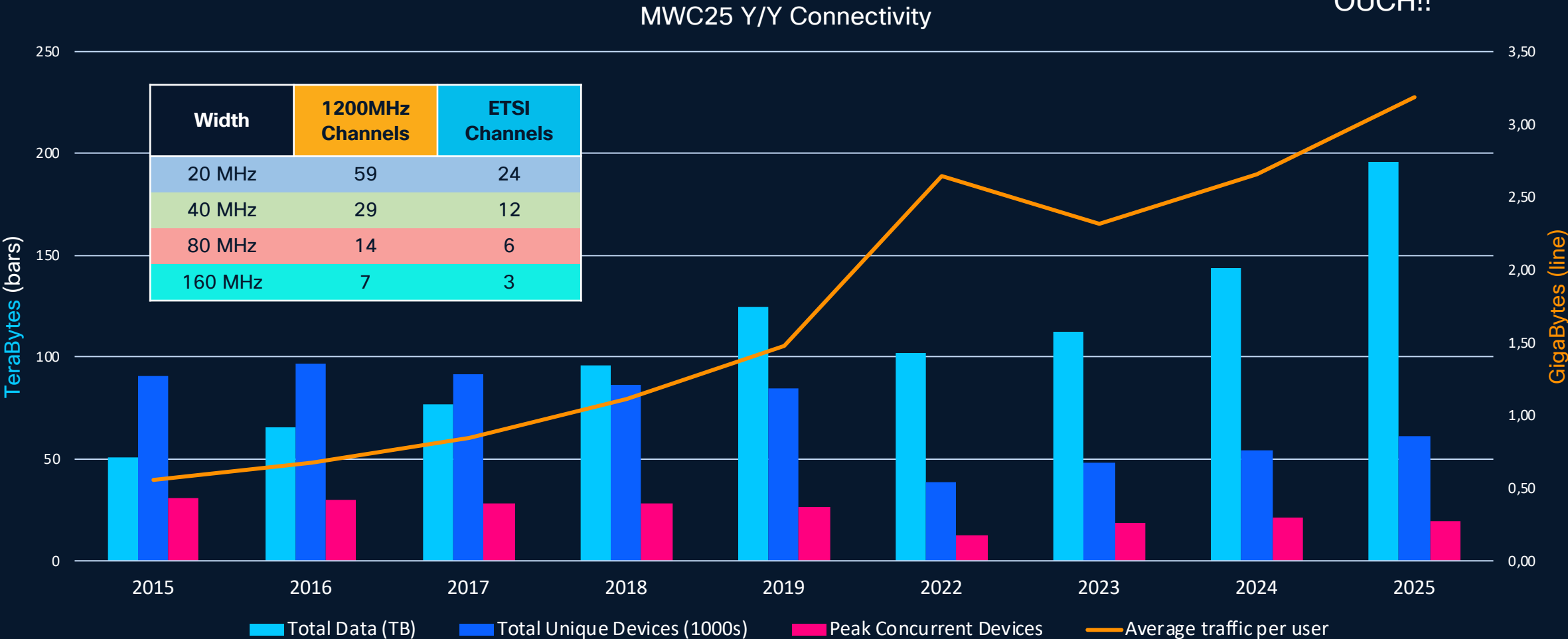

Fira de Barcelona

VENUES. Gran Via

- One of the newest, modern and more efficient
- Located at the business metropolitan área of BCN
- 240.000 m2 gross Surface
- 8 Halls, Convention Centers, Heliports, services and public transport

Mobile World Congress 2025 Barcelona
EU Limits Deployments to 480MHz in 6GHz Today

6GHz using 20MHz Channels
OUCH!!

MWC25 Y/Y Connectivity

Width	1200MHz Channels	ETSI Channels
20 MHz	59	24
40 MHz	29	12
80 MHz	14	6
160 MHz	7	3

TeraBytes (bars)

GigaBytes (line)

2015 2016 2017 2018 2019 2022 2023 2024 2025

■ Total Data (TB)   ■ Total Unique Devices (1000s)   ■ Peak Concurrent Devices   — Average traffic per user

Always Available Mission Critical & Emergency Services
Through Converged Access!

① ②
Emergency Calling
Ability for a Wi-Fi capable device, without any conventional access network credentials, using native dialer make an emergency 911/112/* call over Wi-Fi.

Use of Emergency Passpoint Profile for temporary access

② ③
National Security & Emergency Preparedness (NS/EP)
Wi-Fi APs granting prioritized access for NS/EP (e.g., first responders, and other emergency personnel) users during emergency situations.

Prioritized Access to the medium through the grant of better EDCA Parameters and traffic prioritization.

② ④
Emergency Warning Systems
A system that delivers emergency alerts such as tsunami warnings, earthquake notifications, or AMBER alerts to Wi-Fi users.

Location-based alerts

Hospital

Coffee Shop
Wi-Fi AP

Library
Wi-Fi AP

Requirements

①
Network Access Using Emergency Passpoint Profile for Emergency Calling
- Access Network Supports Emergency Services
- Devices use Emergency Passpoint Profile for temporary access granted by a designated IDP
- Activate profile only when emergency is triggered
- Used in environments where there is no availability of public cellular networks

②
Location of the Caller
- Location signaling from ANP to IDP
- Caller Location Determination for PSAP Routing
- Detect of Rogue Callers & Prevent Location Spoofing
- Location signaling is optional for NS/EP

③
Authorization for Priority Access
- Authorization grant through service provider-controlled interface for NS/EP service

④
Location-based Alerts
- ANP registers with the PWS notification provider
- ANP receives alerts with location metadata
- Alerts are delivered to the access points that match the location in the alert
- Access points then forward the alerts to users over Wi-Fi access.
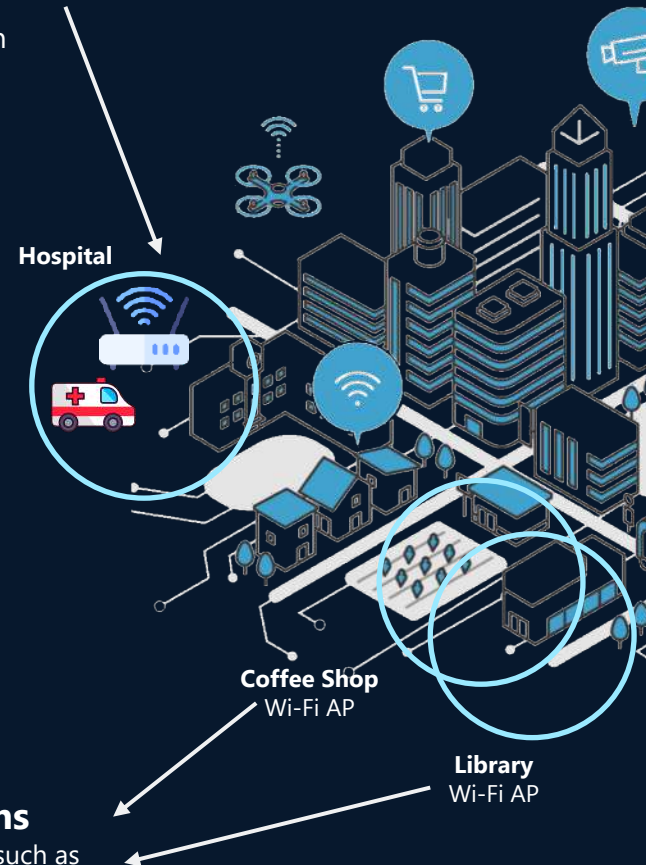
5G is the answer to
Wi-Fi coverage
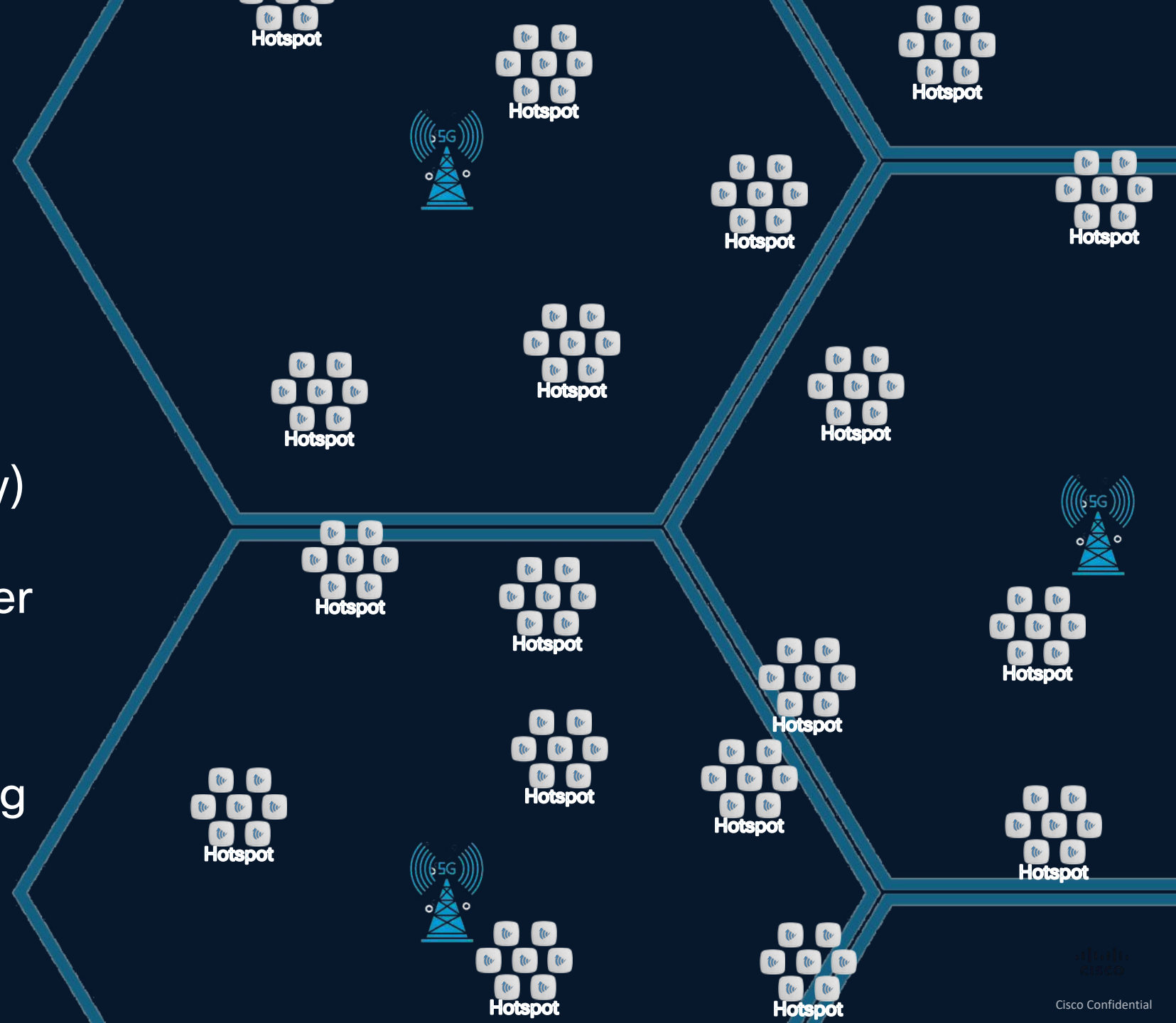–
Wi-Fi is the answer to
cost-effective
5G densification (capacity)
–
Convergence is the answer
to wireless access for
everyone & everything
–
Convergence is happening
Now!

Thank you