4th Utility Expectations

What Does it Mean for Building Network Design?

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Collaborative environments

Untethered workforce

Internet of Things (IoT)

Streaming content

5G

Augmented and virtual reality

Citizens Band Radio Service (CBRS)

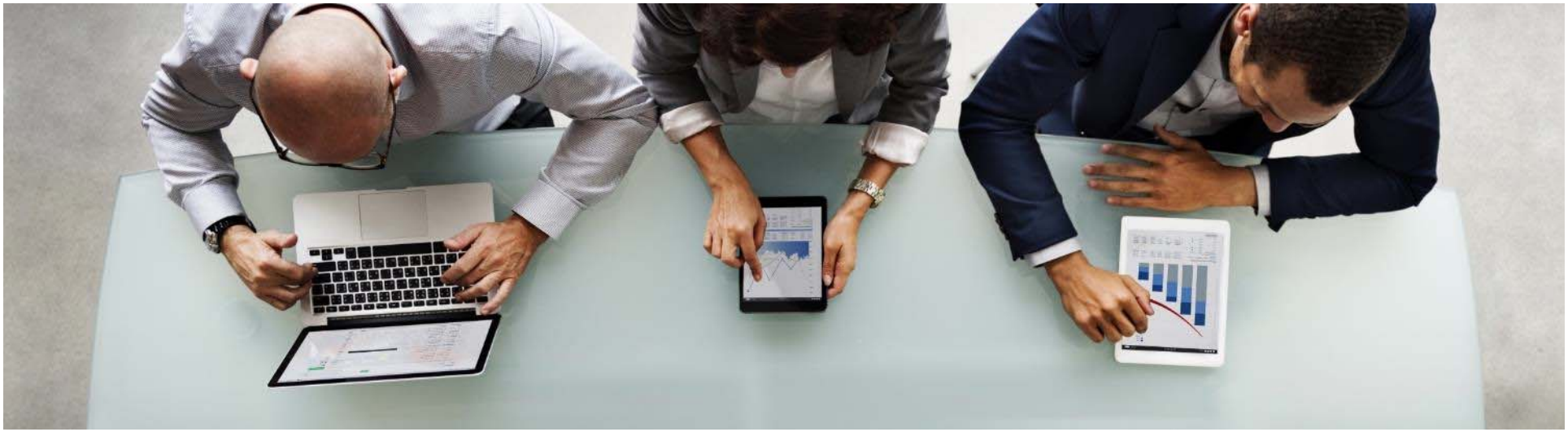
Power over Ethernet (PoE) applications

BYO device

“WiFi-first” networks

Smart buildings

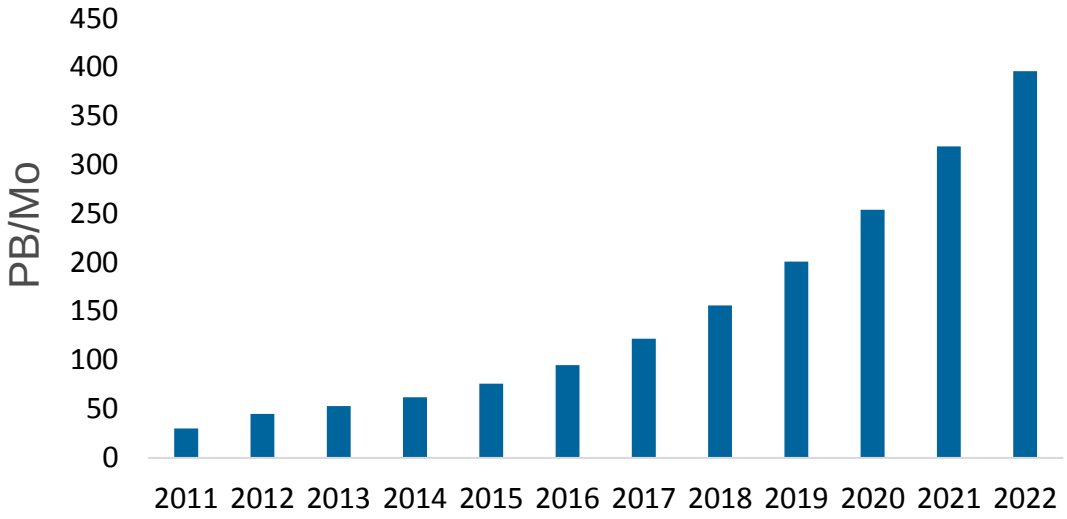
Shared workspaces



Connectivity has become the 4th utility

Global IP traffic is growing at an exponential rate

82% of IP traffic will be video by 2022



Today, **75%** of worldwide video traffic is over mobile

By the year 2020, the IoT will comprise more than

30 billion

connected devices

Source: Cisco, *VNI.* 2018; TIA Smart Buildings, 2019

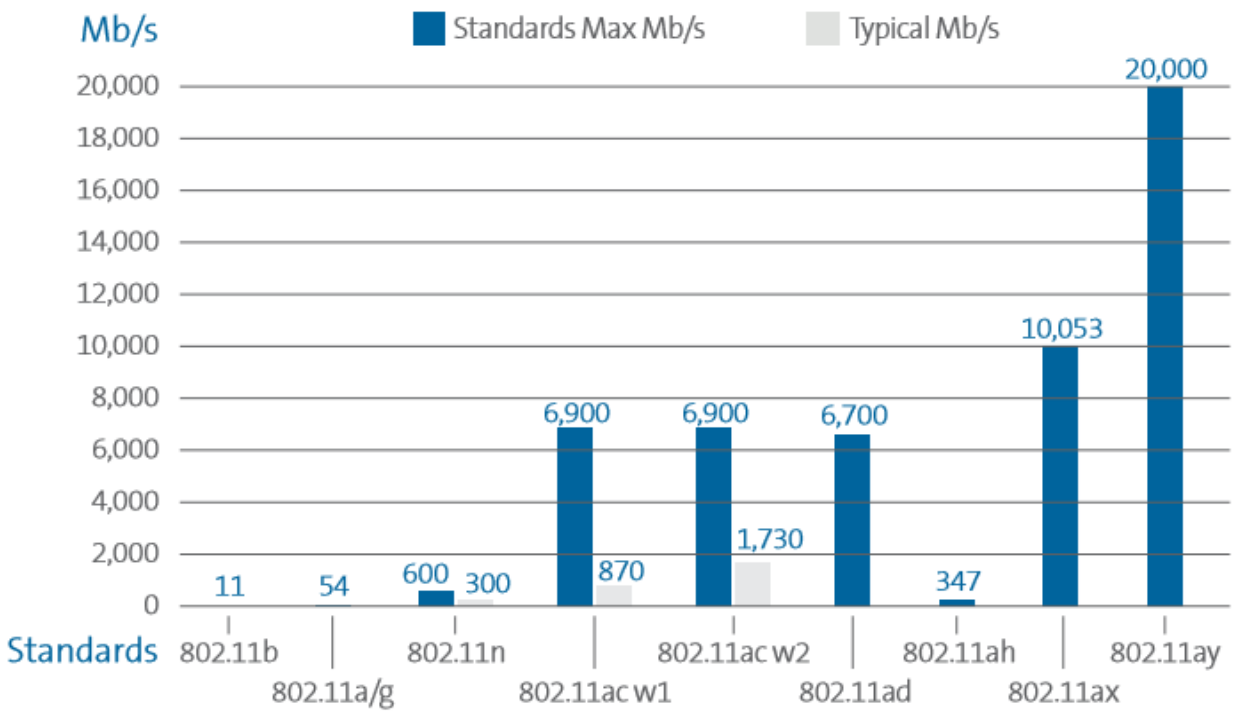
Wi-Fi is the dominant access technology going forward

Higher

Speeds

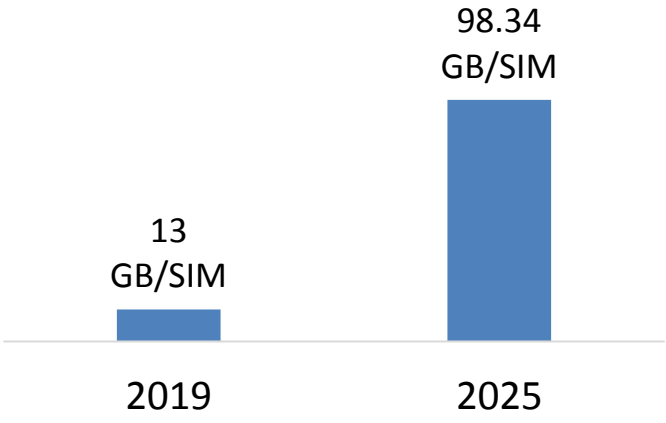
More

Power



Global mobile population is **3.98B unique users** with **80% of all mobile usage** taking place **inside a building**

Monthly mobile data usage will surge to 98.34 GB/SIM by 2025



Source: TIA Smart Buildings, 2019

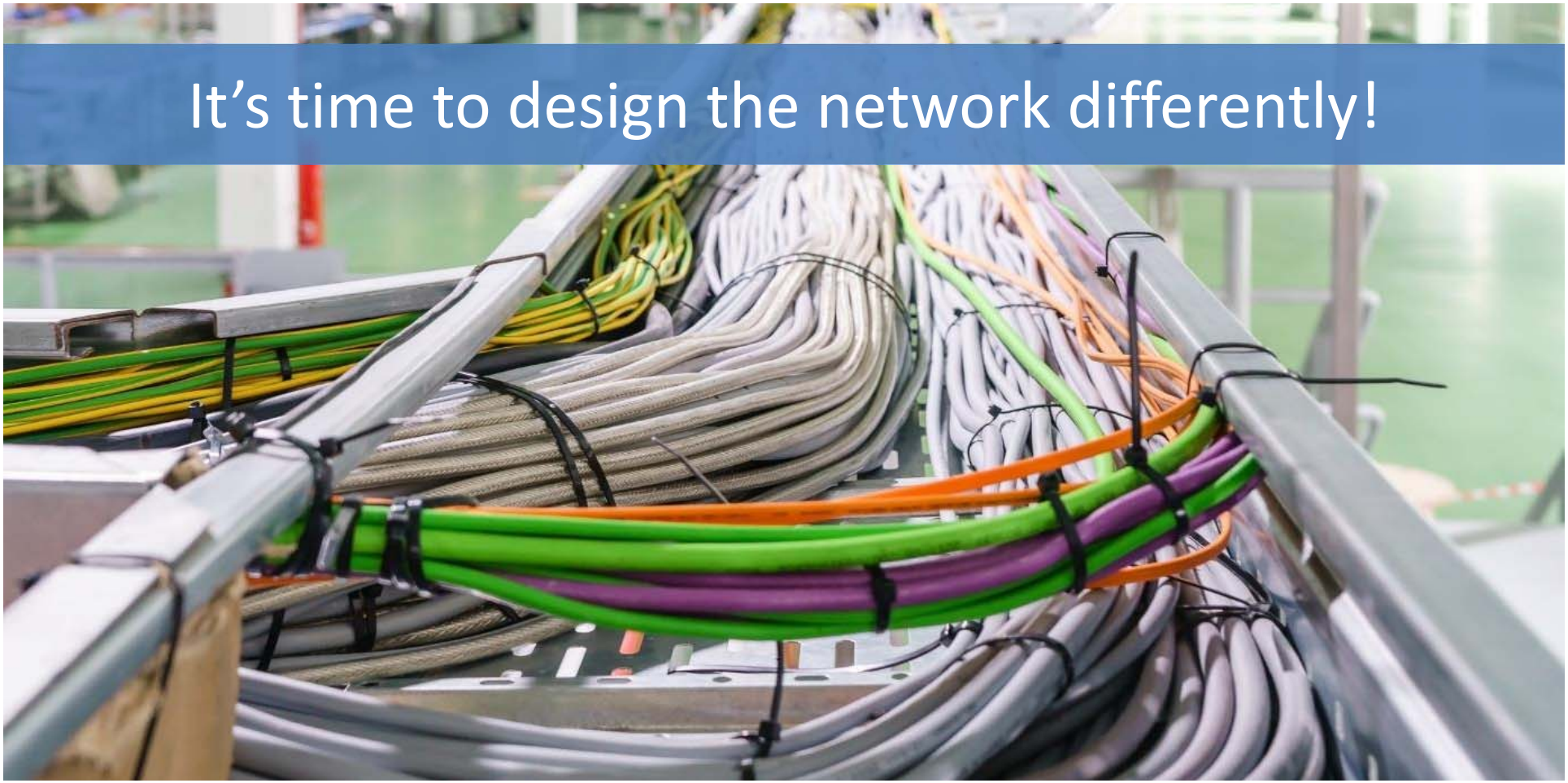
5G will drive network demands

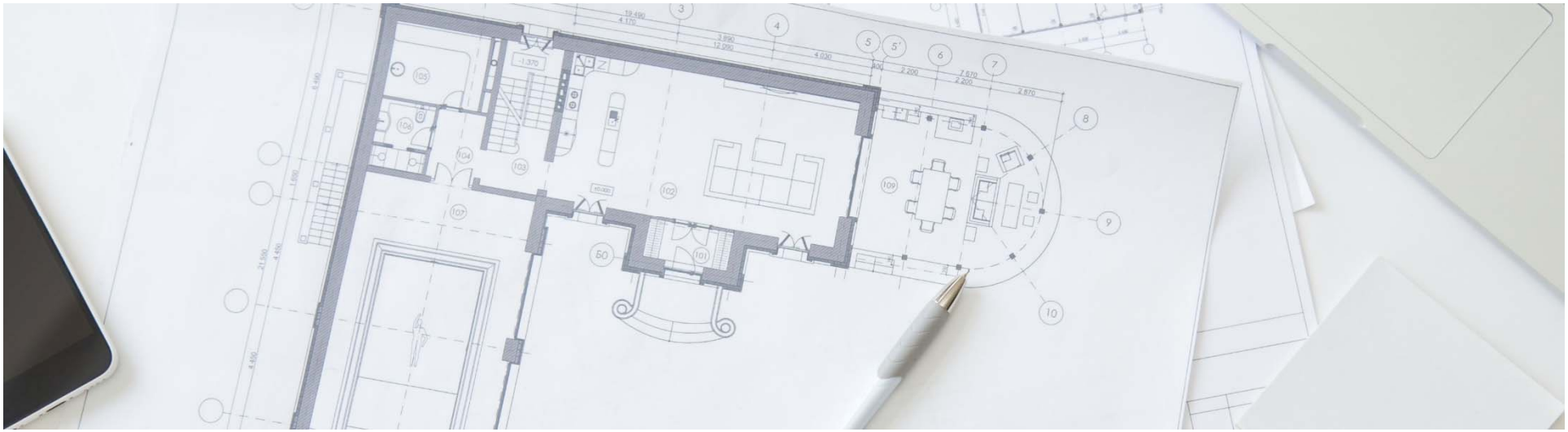
Peak speed per user

- 6.5 Gbps Downlink
- 3.2 Gbps Uplink

Source: Cisco

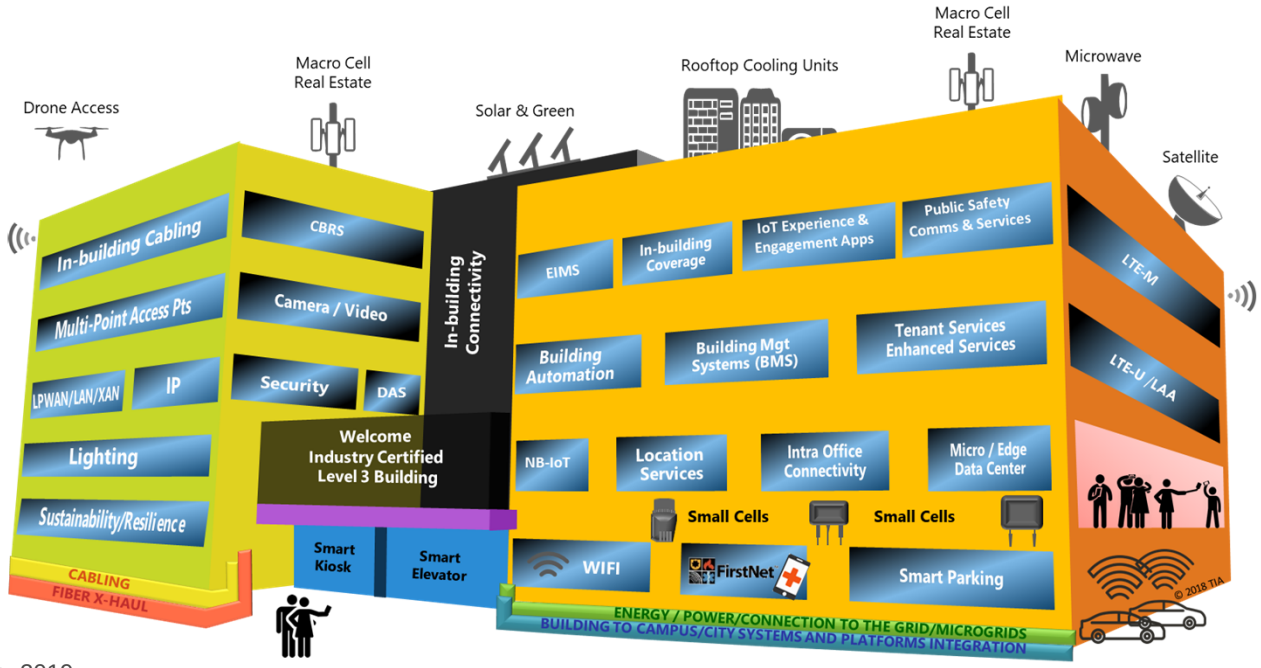
It’s time to design the network differently!



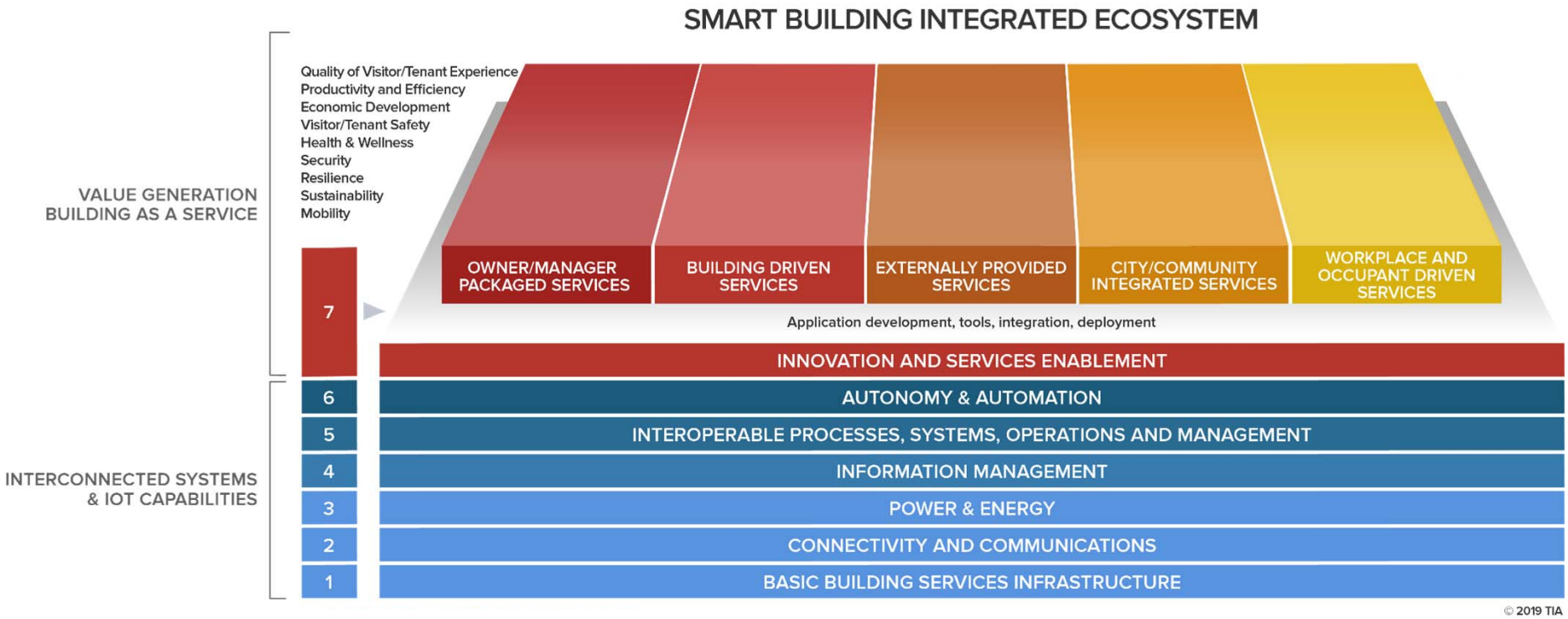


Smart buildings start with smart network designs.

TIA defines a **'smart building'** as one that uses an **integrated set of technology, systems and infrastructure to optimize building performance and occupant experience.**



Source: TIA Smart Buildings, 2019



Source: Telecommunications Industry Association, 2019

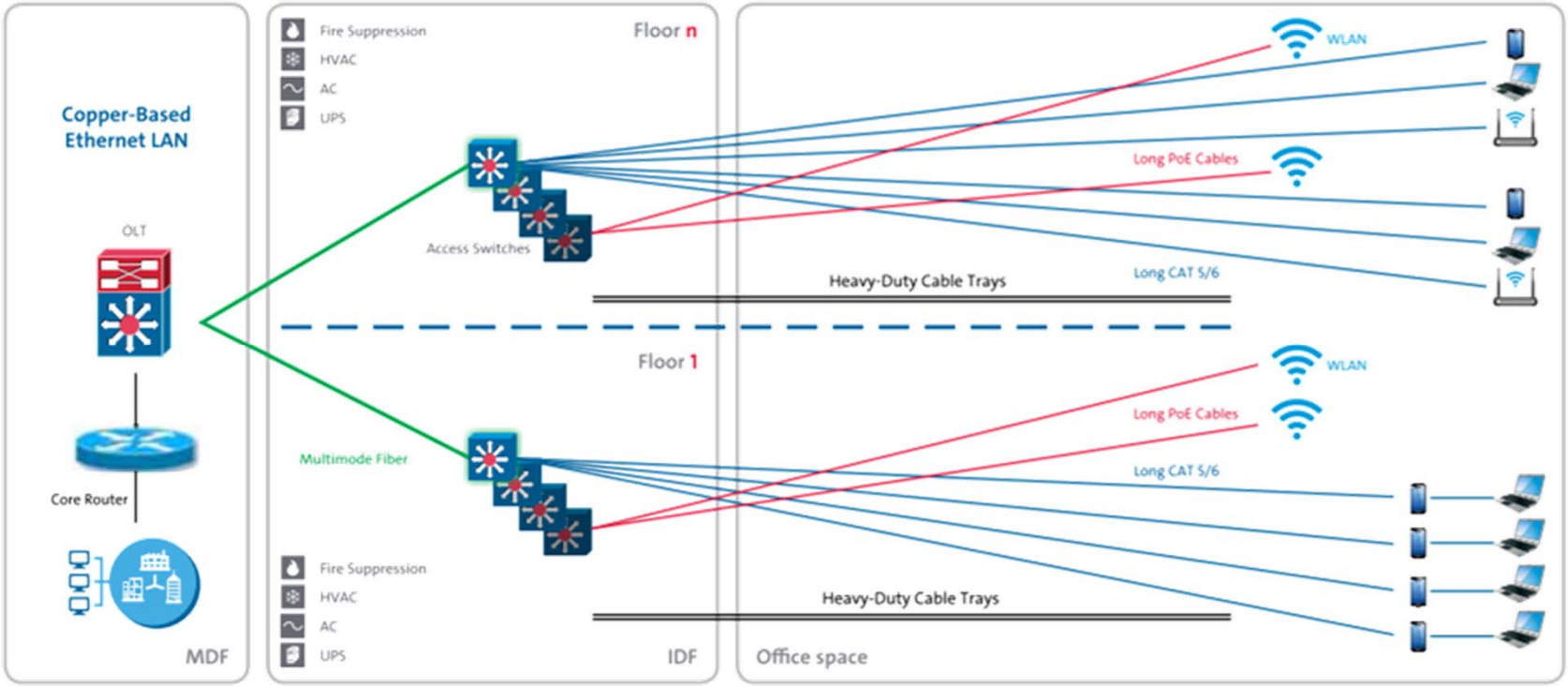
Foundation 2: Connectivity

Source: Telecommunications Industry Association, 2019

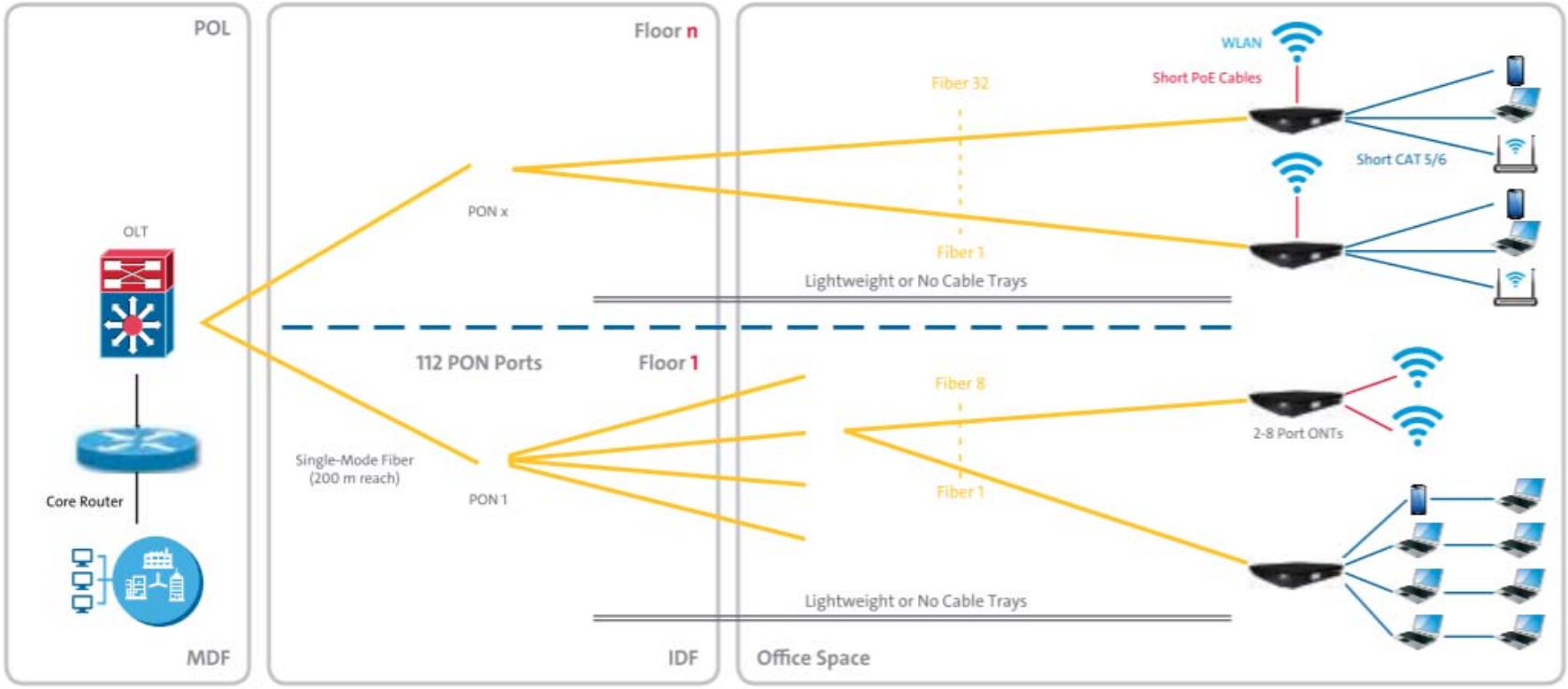
Fiber Deep networking can enable smarter buildings

Smart Building Foundations:	Fiber Deep…
7. Innovation & Services 6. Automation 5. Interoperable Processes 4. Information Management	Enable and centrally manage IP and RF applications that provide key end user experiences
3. Power & Energy	Reclaim space, and reduce energy consumption
2. Connectivity & Communications	Reduce ancillary networking components (racks, conduit, cable trays, etc.)
1. Basic Infrastructure	Reduce construction costs such as IDF closets

Traditional Switched Network Diagram



Fiber Deep Network Diagram

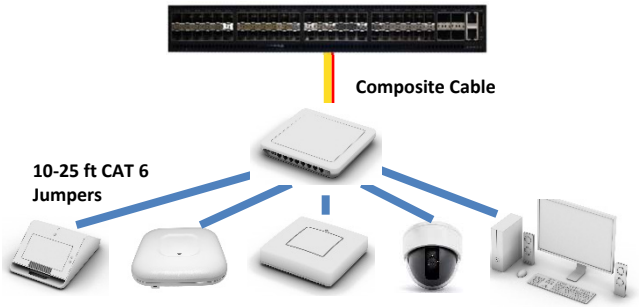


Comparing Architectures

Different

- Leverages a fiber- and power-deep network topology
- Centralized control and flexibility with moves, adds, and changes.

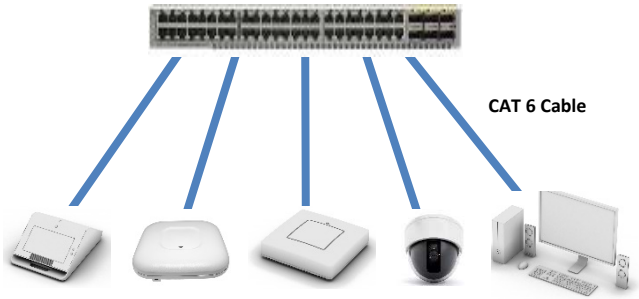
Fiber Deep



Same

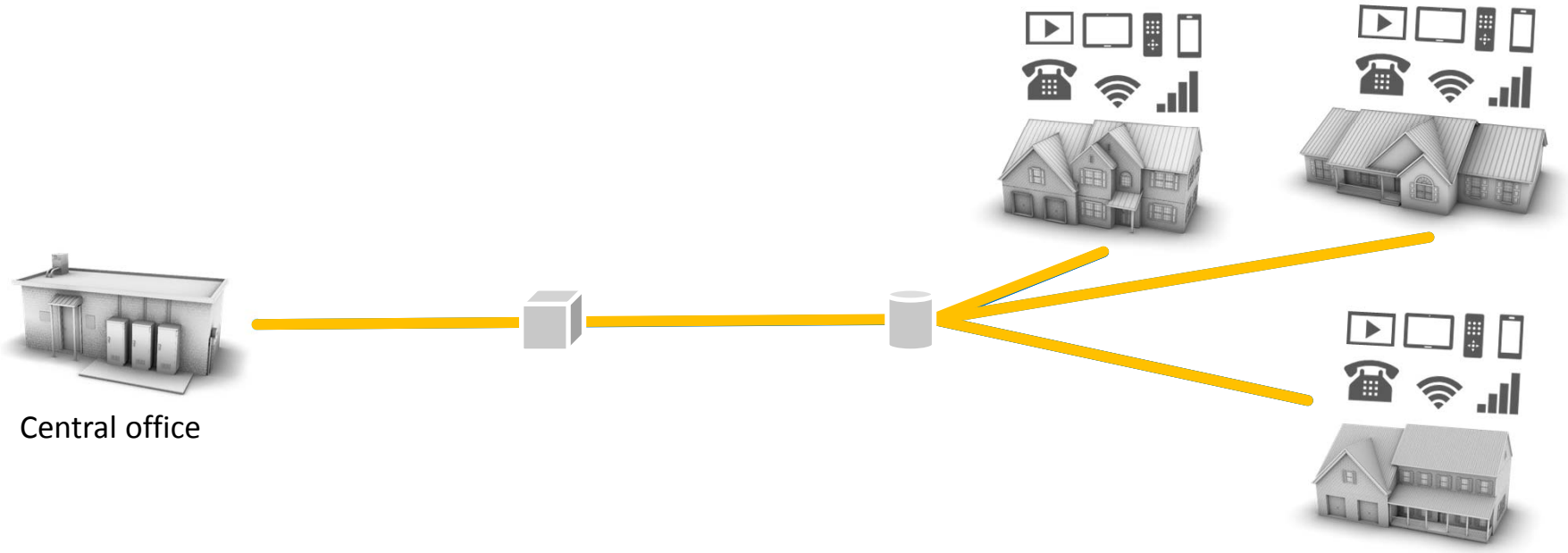
- End devices/applications. Audio/Visual, Wi-Fi, phones, printers….
- Standard IEEE networking protocols and routers

Traditional Copper LAN



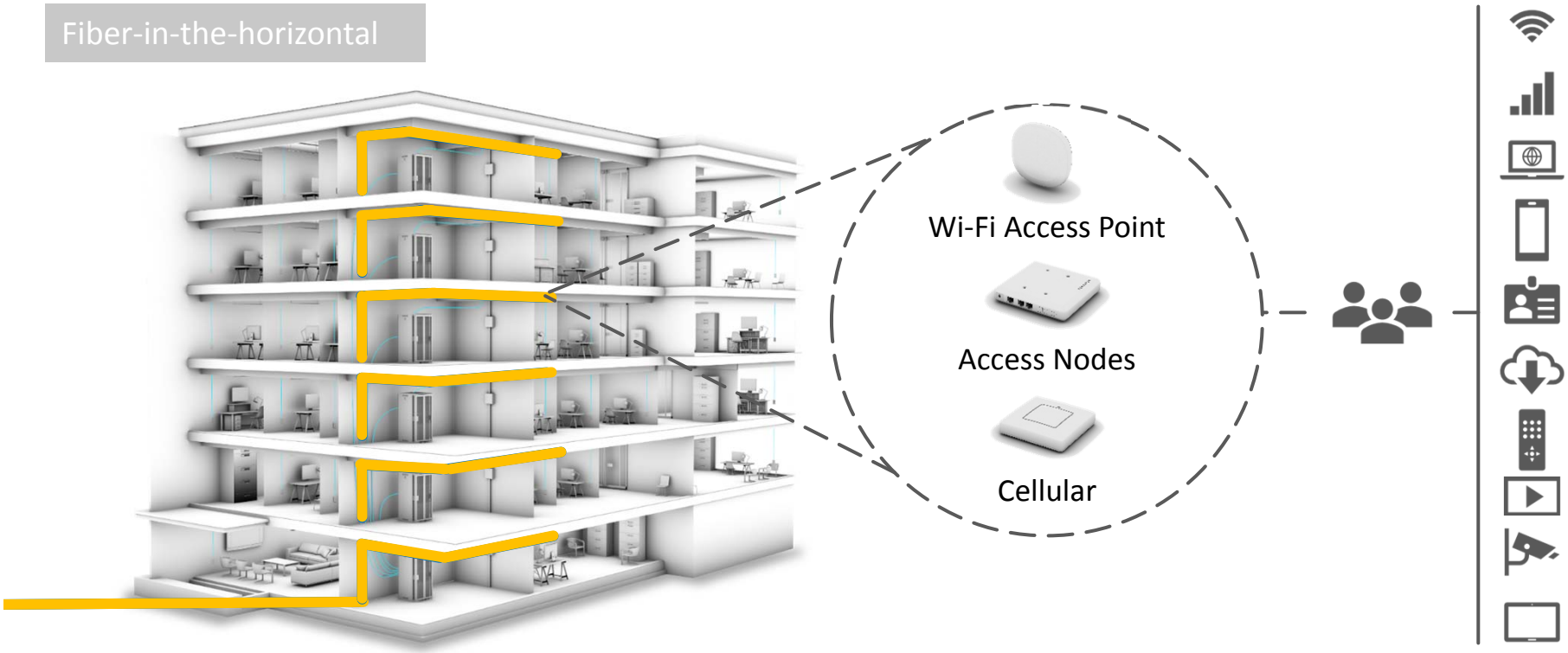
Fiber clears bottleneck as aggregation point moves deeper into the network

Fiber-to-the-home



Fiber clears bottleneck as aggregation point moves deeper into the network

Fiber-in-the-horizontal



Fiber deep in-building solutions

converge multiple technologies over a single, simplified infrastructure.

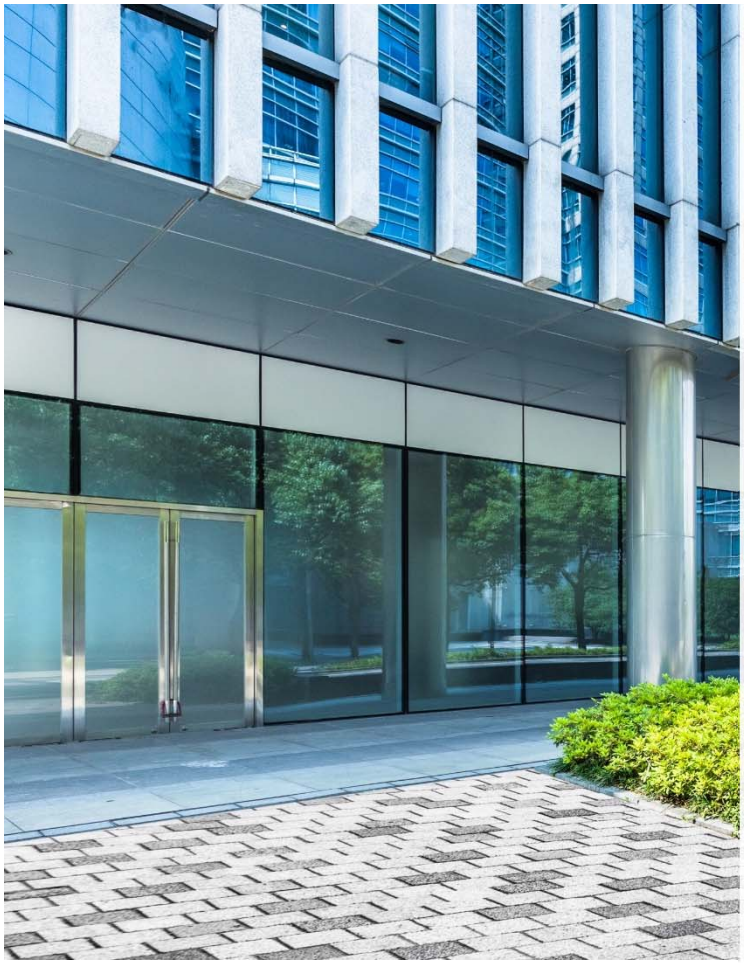
- Up to **30%** lower first-installed cost
- Save up to **50%** on future upgrades
- Virtually **unlimited** bandwidth
- Optimized space utilization
- Low latency
- **Scalable** and **intelligent**

Commercial Office Building

- 170,000 square feet
- 800 employees
- 6 floors

Applications:

- Wi-Fi access points
- 4K TVs
- Café menu boards
- Scheduling panels
- Conferencing phones
- Video conferencing
- In-building cellular
- Printers, workstations
- Sound masking
- Security cameras



Fiber Deep Design:

- Reduced IDF count by 83%
- $50,000 saved per IDF buildout
- Reduced linear feet of cabling by 68%
- Eliminates long, bulky category cable runs
- Reduced cable tray size from 24” to 12”
- Reduces switching equipment expense
- Realized 29% CAPEX savings compared to traditional copper LAN design

	Fiber Deep	Traditional LAN	Savings
Material	$730,170	$972,831	25%
Labor	$137,669	$242,209	43%
Total	**$867,839**	**$1,215,040**	**29%**

* Comparison is based on network electronics and associated labor. Numbers do not include endpoints (WAPs, cellular radio nodes, printers, etc. which are the same in both cases).

Significant savings by moving to a Fiber Deep architecture

	Small Office Building	Medium Office Building	Large Office Building	Campus	Outdoor Cameras
Footprint (ft^2/m^2)	3000/ 279	51000/ 4724	180000/ 16723	14 buildings 2000 drops	48 drops
Employees	15	65-70	800	N/A	N/A
Applications	• Wi-Fi, • Security cameras • Voice • Data	• Wi-Fi • Sound Controllers • Security cameras • Voice • Cellular • Printer • Displays	• Wi-Fi • Sound masking • Security cameras • A/V • Cellular	• Wi-Fi • Voice • Data • A/V • Security cameras	• Outdoor Cameras
Overall Savings	**17%**	**34%**	**29%**	**48%**	**50%**

Connectivity is the 4th Utility

Think about infrastructure early to optimize your building design & performance.