SMART CITIES NEED RELIABLE NETWORK

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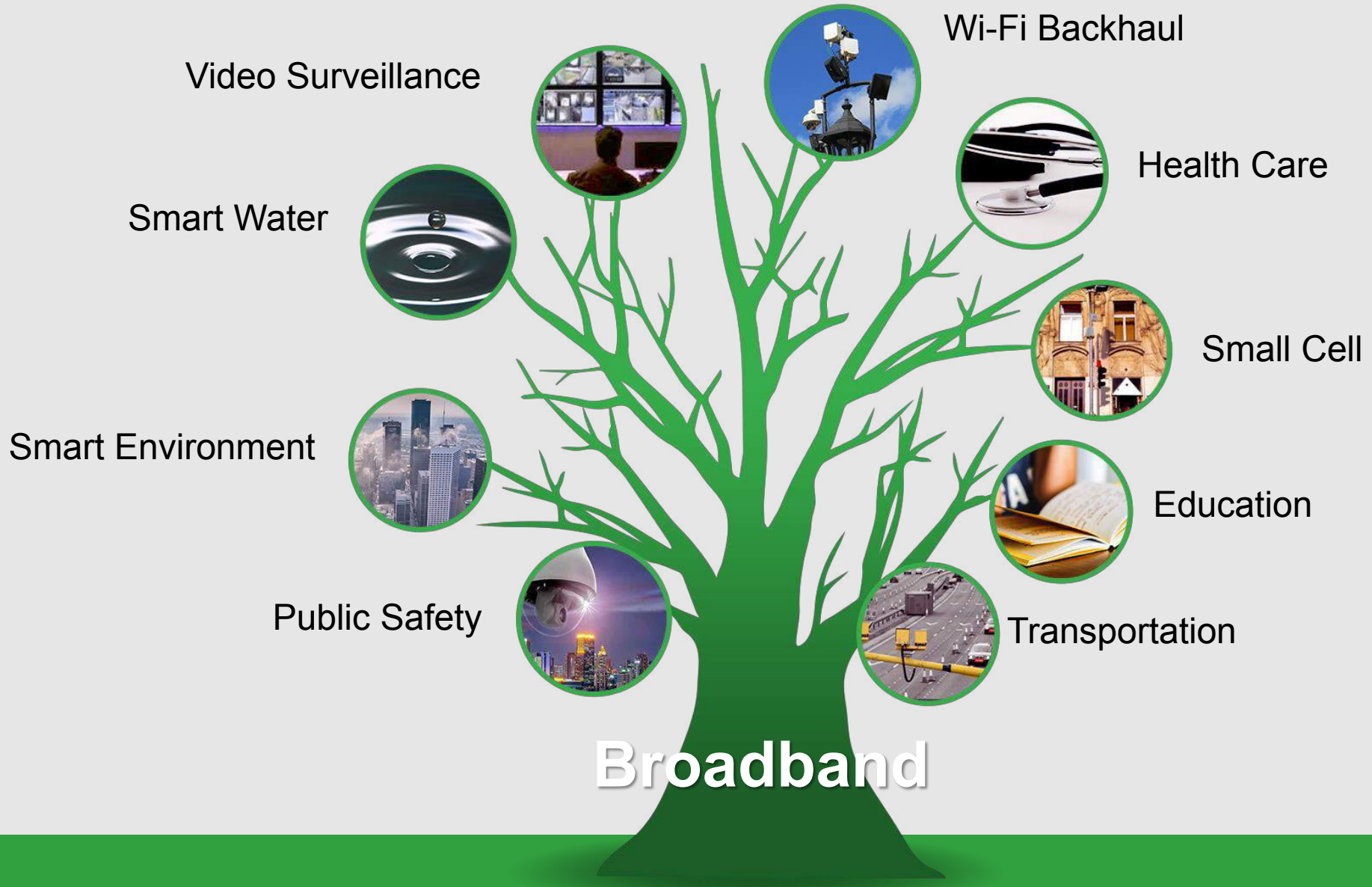
Municipalities Digitally Transforming into Smart cities

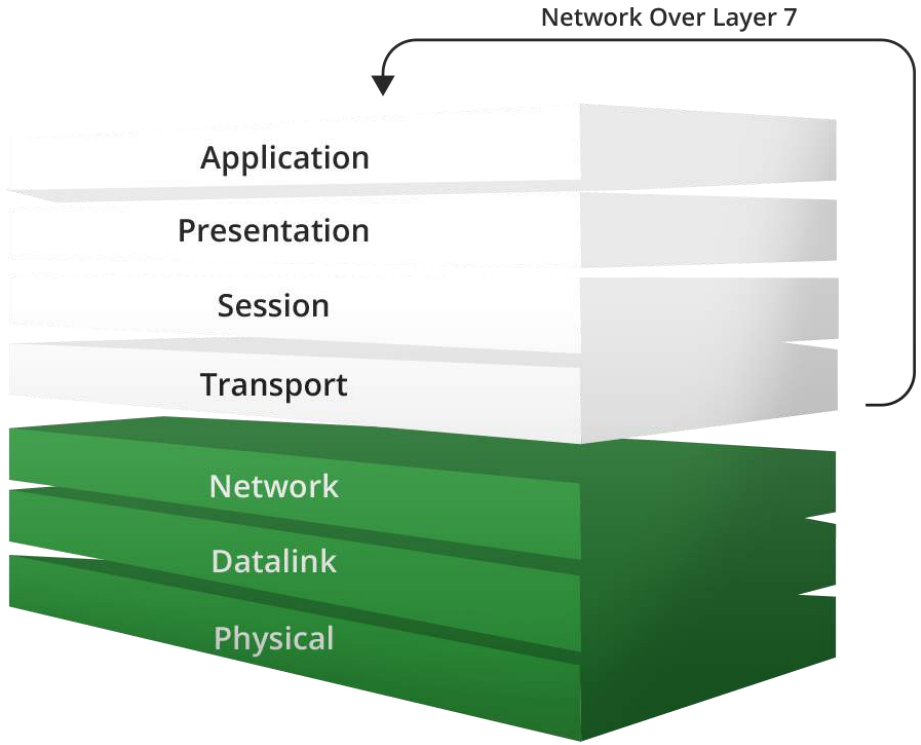
- Smart City solutions help address many of the key challenges cities face today, including:
- Economic development
- Sustainably managing strained infrastructure like roads and water
- Reducing the digital divide
- Meeting increasing resident, visitor, and business expectations for a fully connected mobile experience

Connectivity is the Foundation of Smart City



SMART CITY STARTS WITH RELIABLE NETWORK!

- Reliable independent city wide network
- Aggregating all network consumer over single infrastructure:
  - City voice and data Communication needs
  - Surveillance systems
  - Public services, WiFi
  - Variety of sensors



FIBER is the Ultimate solution ?

Multi Gigabit capacity

Interference-free

Future-proof

Fiber

Expensive

Slow time to market

Complex to deploy

Intrusive installations

Fiber Cut

How about LEGACY WIRELESS?

Low cost

Fast implementation

Network Flexibility

Legacy wireless

Interference

Easily hacked

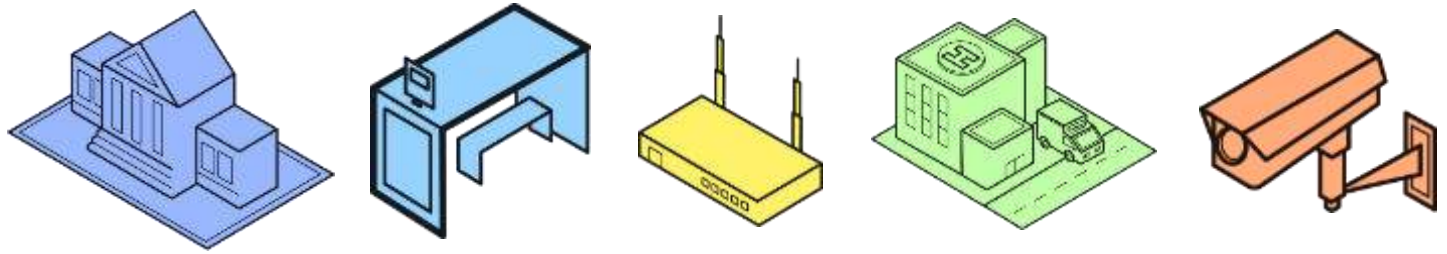
On going support required

Limited capacity

SMART CITY WIRELESS APPLICATIONS

Standard	Bluetooth	ZigBee	Z-Wave	6LowPAN	Wi-Fi	NFC	SigFox	Neul	LoRaWAN
Frequency	2.4GHz	2.4GHz	900MHz	≤2.4GHz	2.4GHz, 5GHz	13.56MHz	900MHz	400÷900MHz	<1GHz
Capacity	<1Mbps	<250Kbs	<100Kbs	<250Kbs	<200Mbps	<420Kbps	<1Mbps	<100Kbps	<50Kbps

Same Frequencies for multiple applications?



Meet mmWave wireless

MMWAVE – Fiber like performance

mmWave Wireless

Multi Gigabit Capacity

Immune to interference

Secure

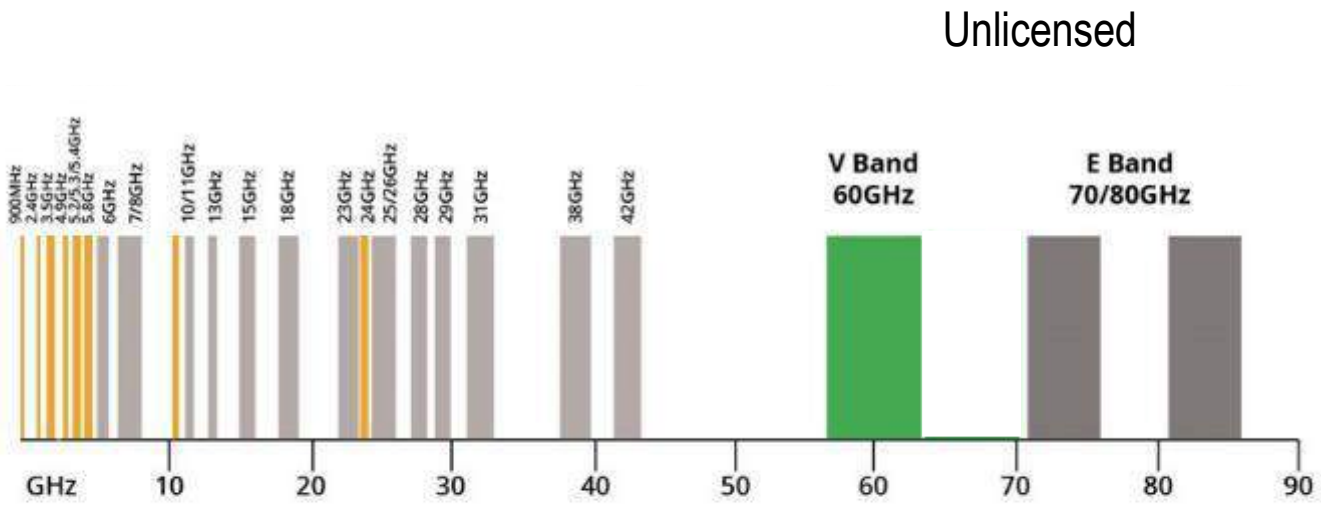
Affordable

Very low latency

Quick time to market

WHAT IS MILLIMETER WAVE WIRELESS?

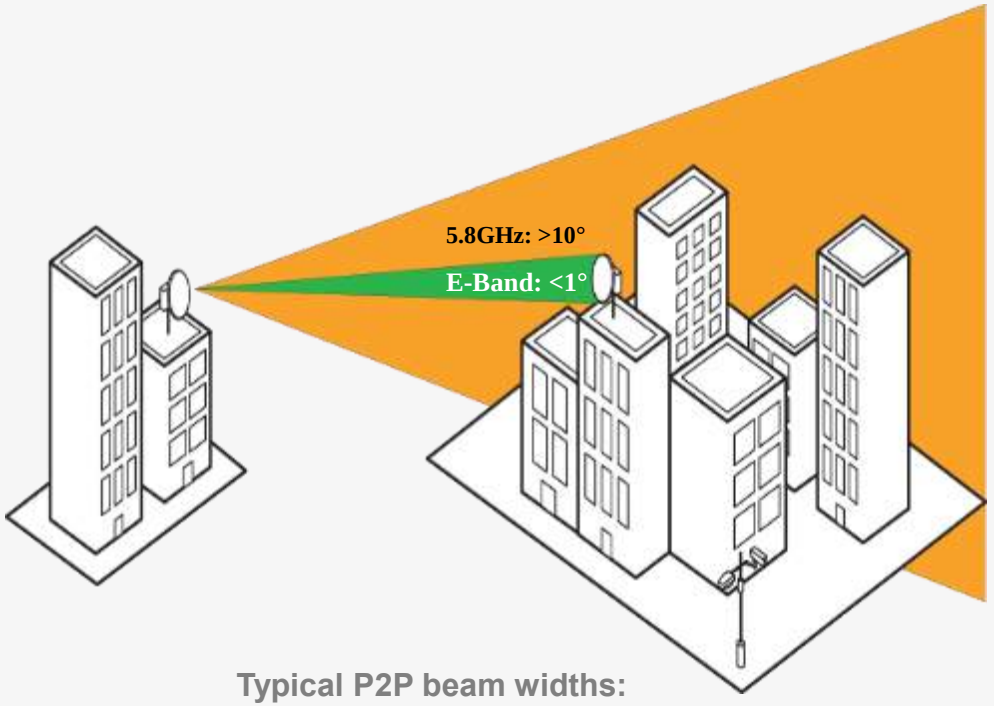
Widest spectrum - High capacity!



Narrow beams - No Interference!

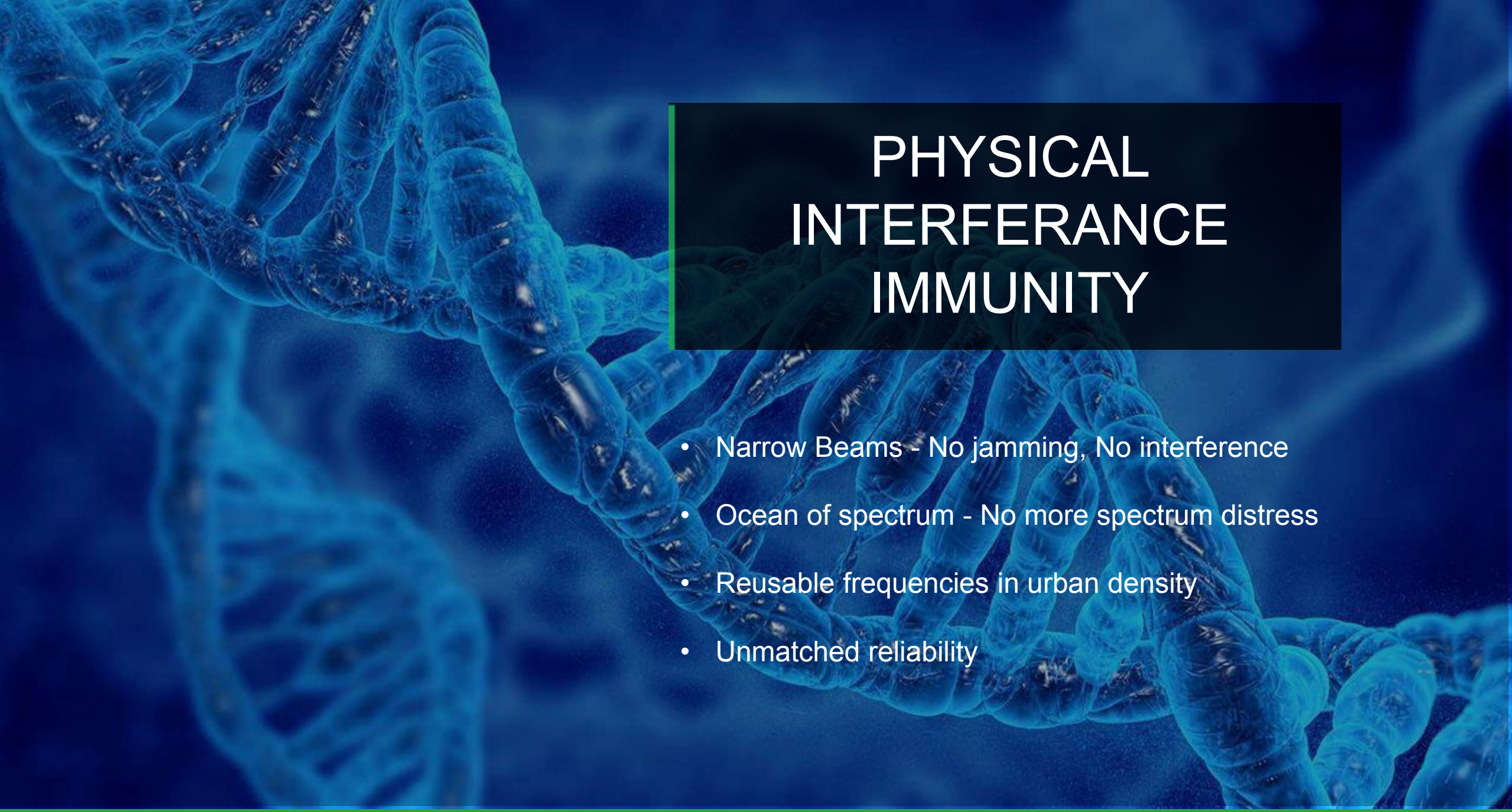
V-Band (60 GHz)
Unlicensed, 9GHz

E-Band (70/8 GHz)
Unlicensed , 10GHz



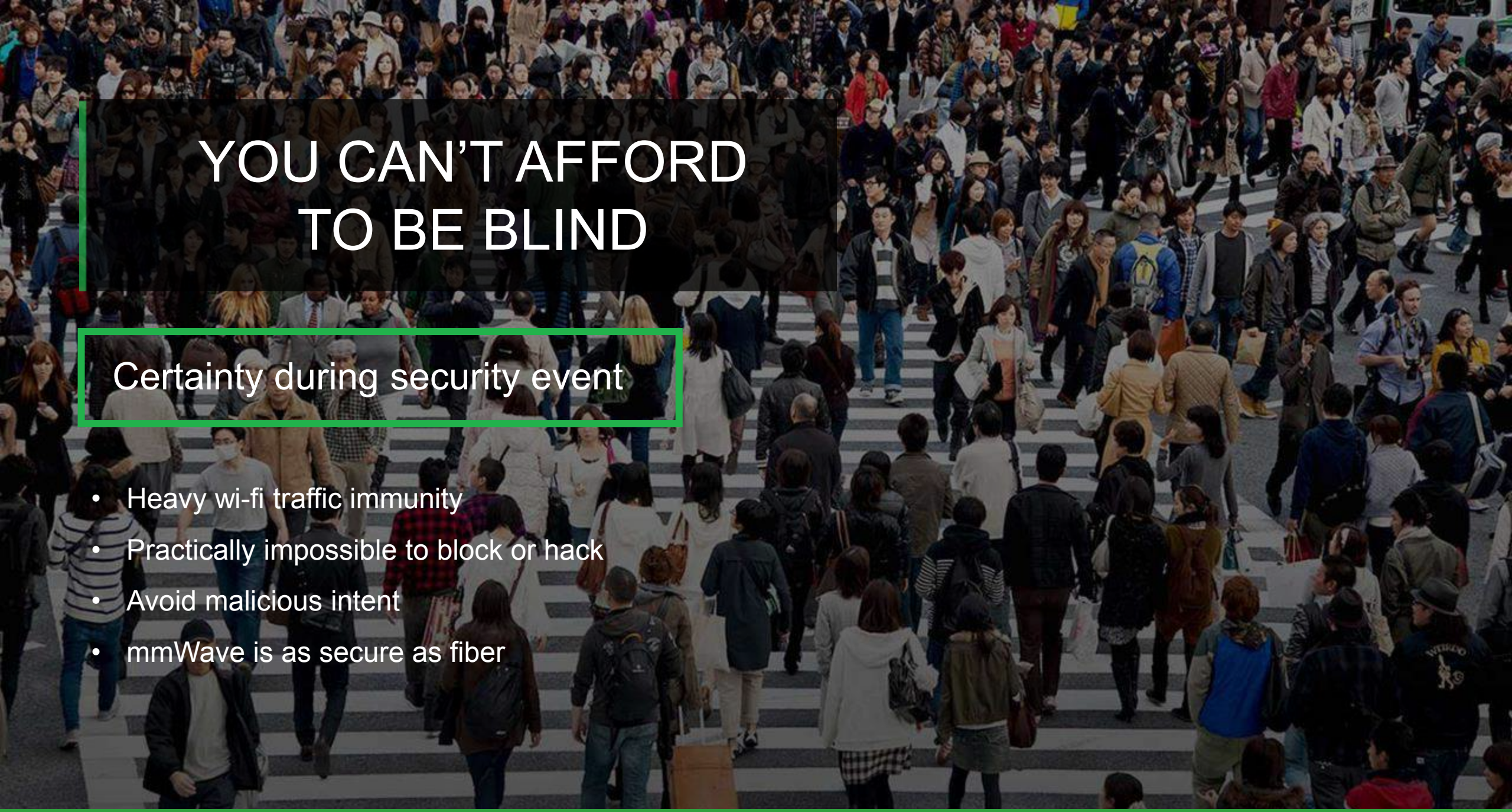
Typical P2P beam widths:

- 5GHz
- 70GHz



PHYSICAL INTERFERANCE IMMUNITY

- Narrow Beams - No jamming, No interference
- Ocean of spectrum - No more spectrum distress
- Reusable frequencies in urban density
- Unmatched reliability

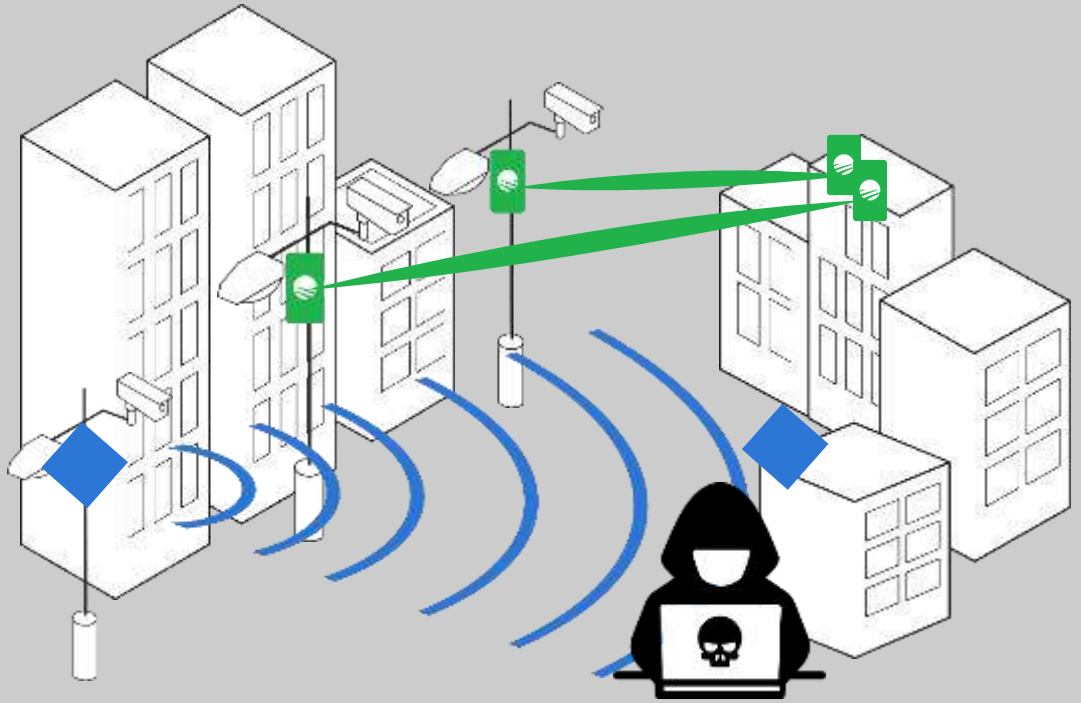


YOU CAN'T AFFORD TO BE BLIND

Certainty during security event

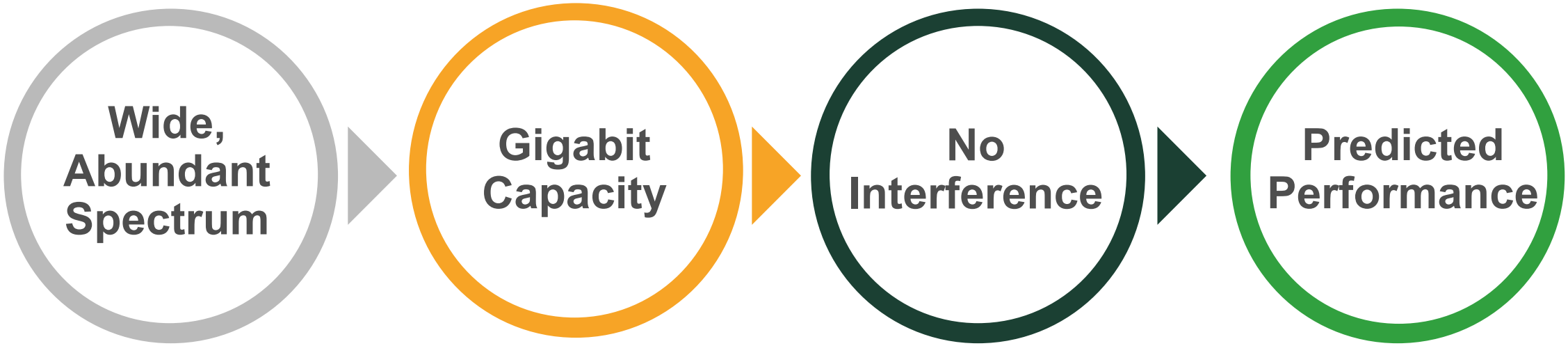
- Heavy wi-fi traffic immunity
- Practically impossible to block or hack
- Avoid malicious intent
- mmWave is as secure as fiber

Encrypted network is no longer enough



- Virtually impossible to monitor the network
- Do not get the time to crack the encrypted network
- mmWave is as secure as fiber

Millimeter Wave Facts



Hybrid Fiber Wireless – High performance practical solution

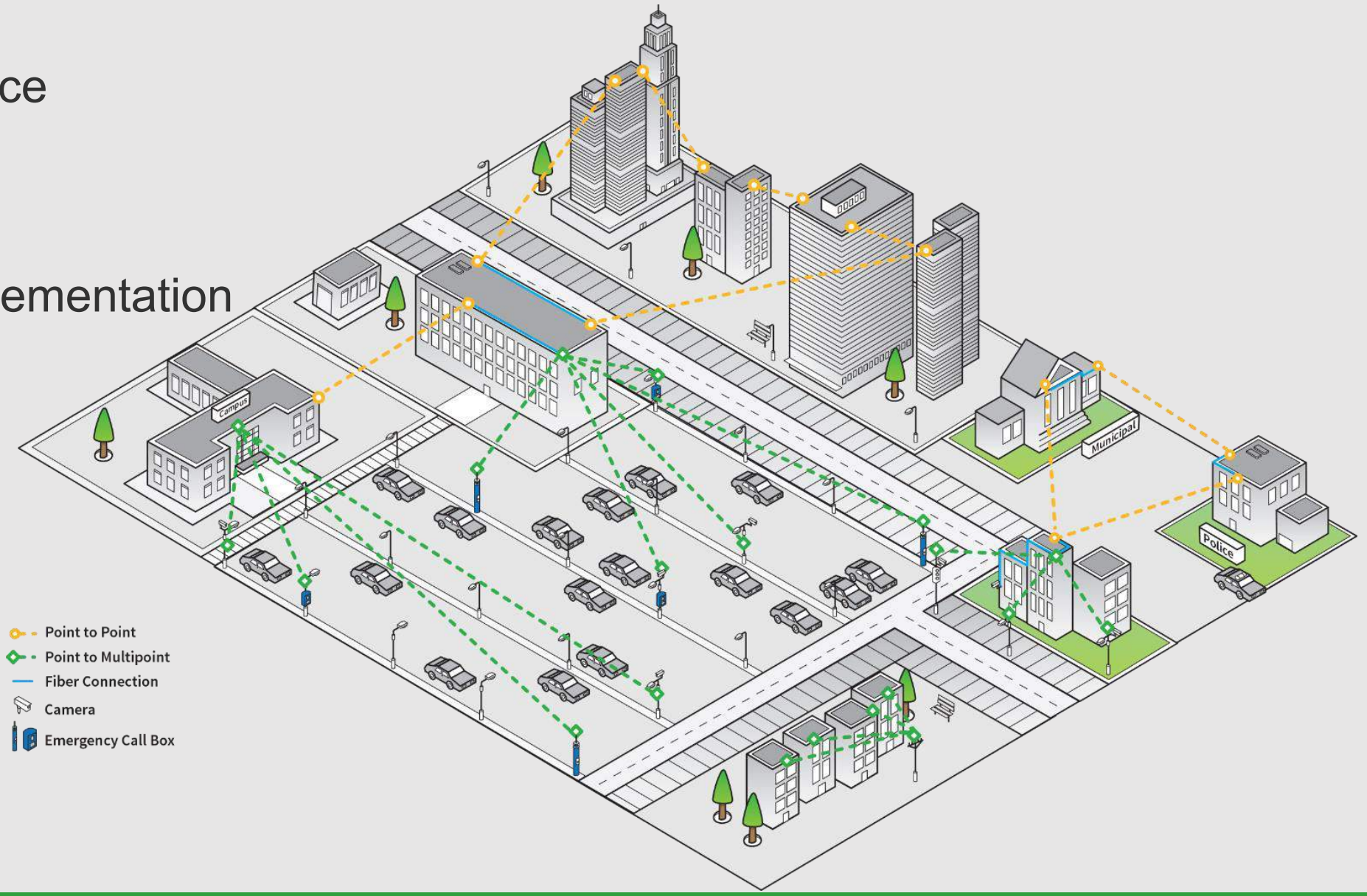
FIBER

+

mmWave WIRELESS

SMART CITIES WITH HYBRID FIBER WIRELESS

- Fiber like performance
- Affordable
- Fast & painless implementation



Real life Examples

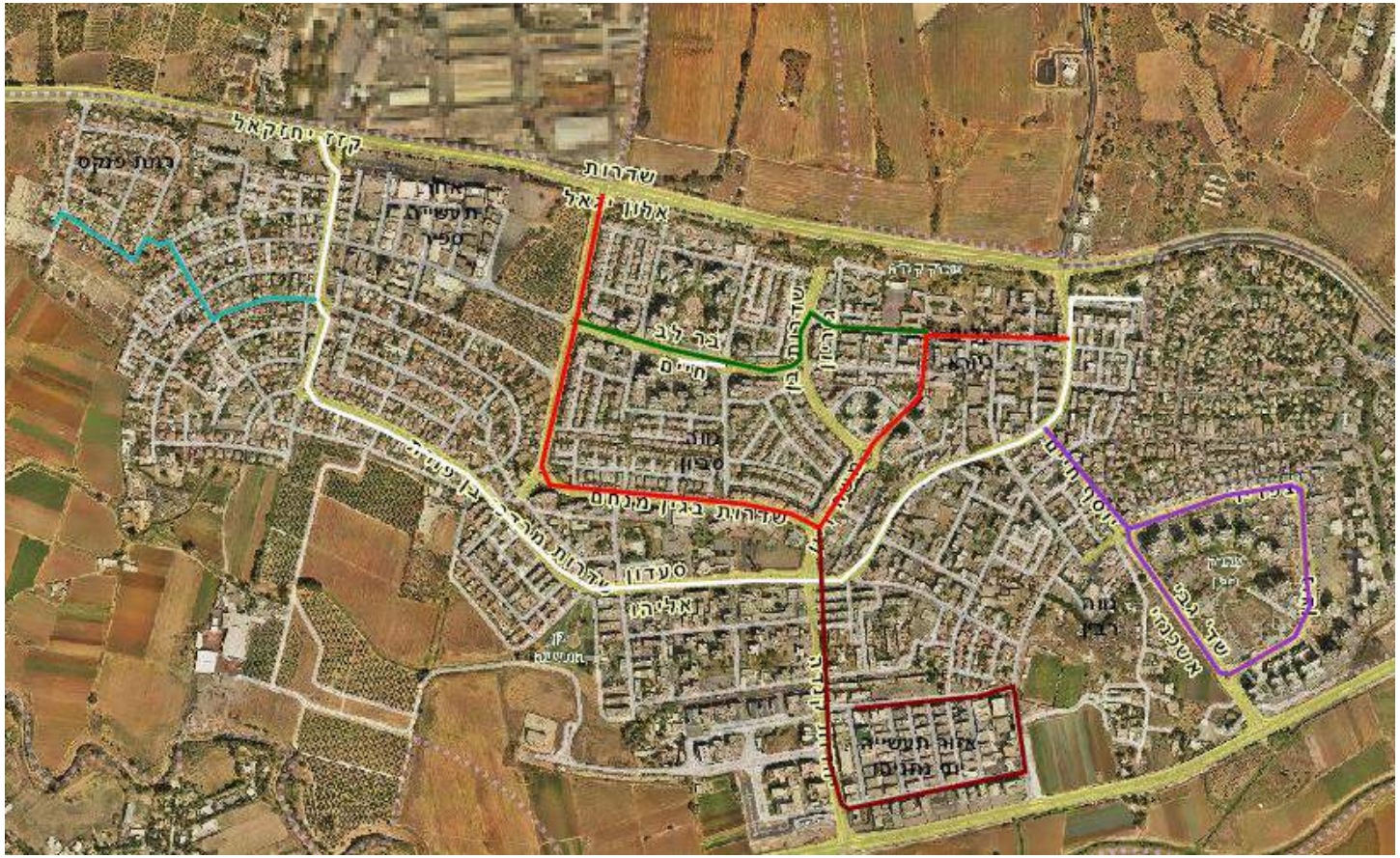
Prerequisites for Smart City Project launch

- Leadership and Vision
- Dedicated and engaged team (internal and external)
- Access to real-estate – shelters, vertical assets, Utility
- Proper IT system
- Financing
  - City Funded
  - Private Public Partnership (PPP)
  - Service provider

Tel Aviv (Sub) Case Study

THE FIBER OPTION

- Basic Back Bone
- Total 11.2Km of Fiber
- Cost per meter – 6000Ru
- Total Fiber cost – Ru67.2M
- Fiber Equipment cost – Ru68M
- <u>Total – Ru135.2M</u>



THE HFW OPTION

- Wireless + Networking Equipment – Ru30.6M
- Installation cost – Ru13.6M
- <u>Total – Ru44.2M</u>

PROJECT FINANCING

Main source of Financing - OPEX Saving

- Municipality Telephone lines
- VPN between municipality buildings
- Schools Telephone lines
- Schools broadband connectivity

- Expenditure Increase due to project implementation - 0

Cambridge, UK

CAMBRIDGE CITY, UK

- One network serves 254 cameras:
  - City center
  - Car parks
  - Housing projects
  - City's anchors
  - Temporarily installs for special events

- **Backhaul**: migrate from leased fibre lines, delivering significant operating expense reductions

Вопросы
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