The background of the slide is a photograph of several radio towers at night. The towers are silhouetted against a dark sky filled with stars and the Milky Way. Bright green, glowing trails of light curve around the towers, suggesting signal paths or data flow. The overall mood is technological and futuristic.

CanWISP

Multichannel, mmW and Multiband Technologies

March 30, 2021

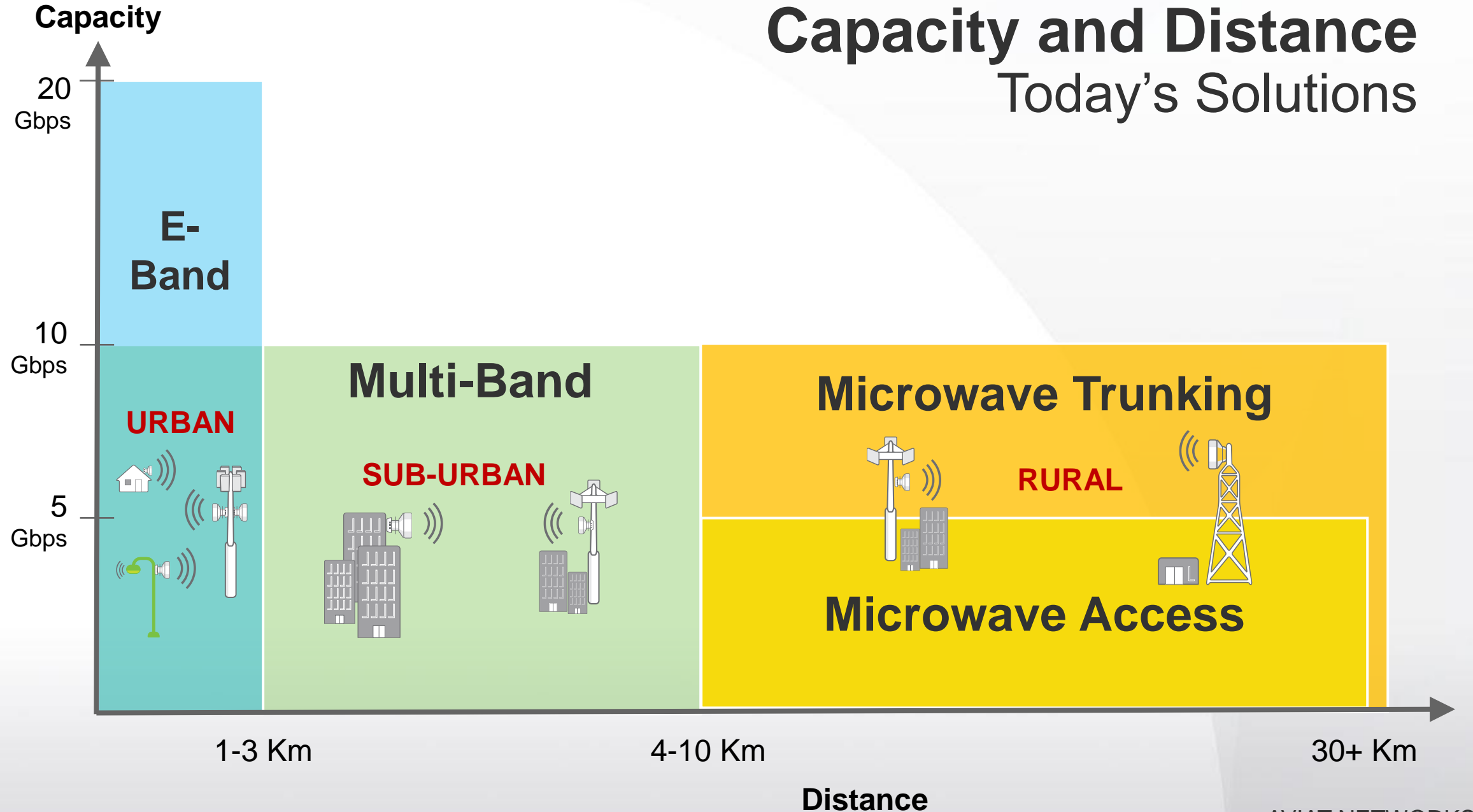
MORE CAPACITY IS ALWAYS NEEDED



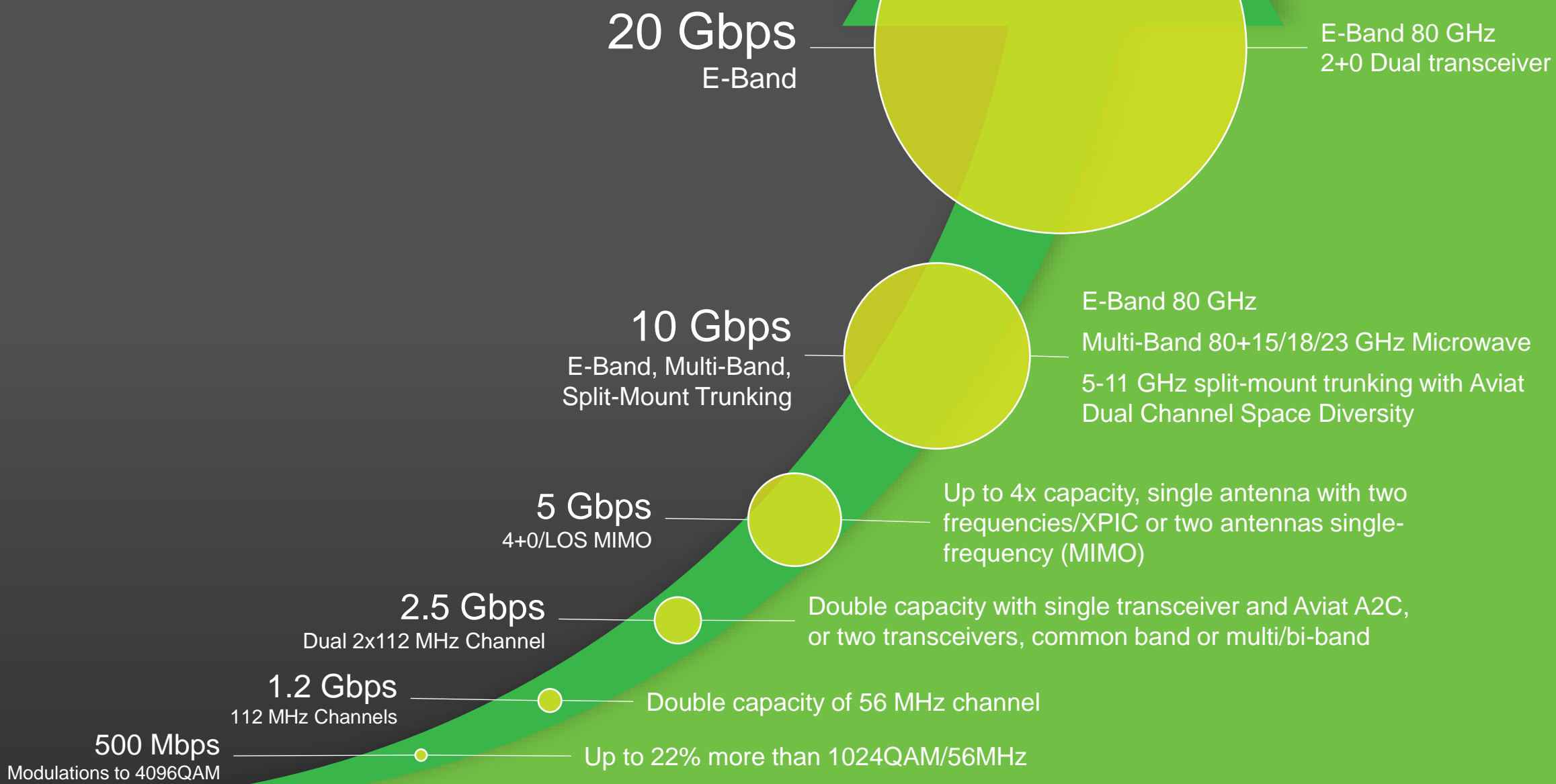
- More capacity is needed for network modernization and preparation for 5G.
- Traditional microwave bands are becoming congested and expensive to use.
- There will always be challenges to find fiber everywhere at reasonable cost.
- There will be a continued need for a wireless transport alternative, and in the short/mid-term existing technologies can largely manage the capacity needs.

Capacity and Distance

Today's Solutions



Capacity Options



An iceberg floating in the ocean. The small tip above the water is labeled 'TCO' and 'PURCHASE PRICE'. The much larger submerged part of the iceberg is associated with a list of other costs. A horizontal line separates the visible tip from the submerged base.

PURCHASE PRICE

Installation
Maintenance
Upgrades
Spectrum fees
Power costs
Tower and Site costs
Air Conditioning costs
Tower Lease fees

TCO is now the major Economic consideration

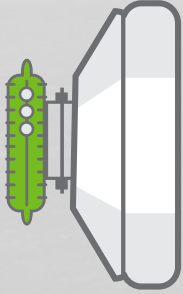
WHAT IS MULTI-BAND?



Multi-Band

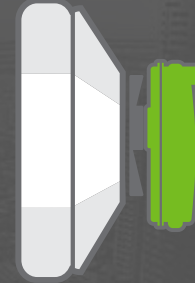
Combines the best of two proven technologies

Microwave



- 5 to 42 GHz
- Longer links
- Lower capacity
- High Availability

Millimeter Wave



- 70 to 90 GHz
- Very short links
- High capacity
- Lower Availability



Microwave, E-Band or Multi-Band?

	Microwave (11-26 GHz)	E-Band	Multi-Band (80+11/15/18/23/26 GHz)
Capacity (per RFU)	Low (500 Mbit/s)	High (10 Gbit/s)	High (10 Gbit/s)
Maximum Link Distance	Medium	Short	Medium (up to 8km)
Availability	High (5-9's)	Average (4-9's)	High (5-9's) for priority traffic
Spectrum Costs (typical)	High	Low	Low-Medium
Spectrum Management	Per link Licensing	Per link Licensing	Per link Licensing
Spectrum Congestion	High	Low	Low
Installation Complexity	High	Medium	Low
Equipment costs	High	Medium	Medium
Ease of Upgrade (capacity)	Difficult	Easy	Easy

Multi-Band beats Microwave and E-Band for longer, high-capacity links

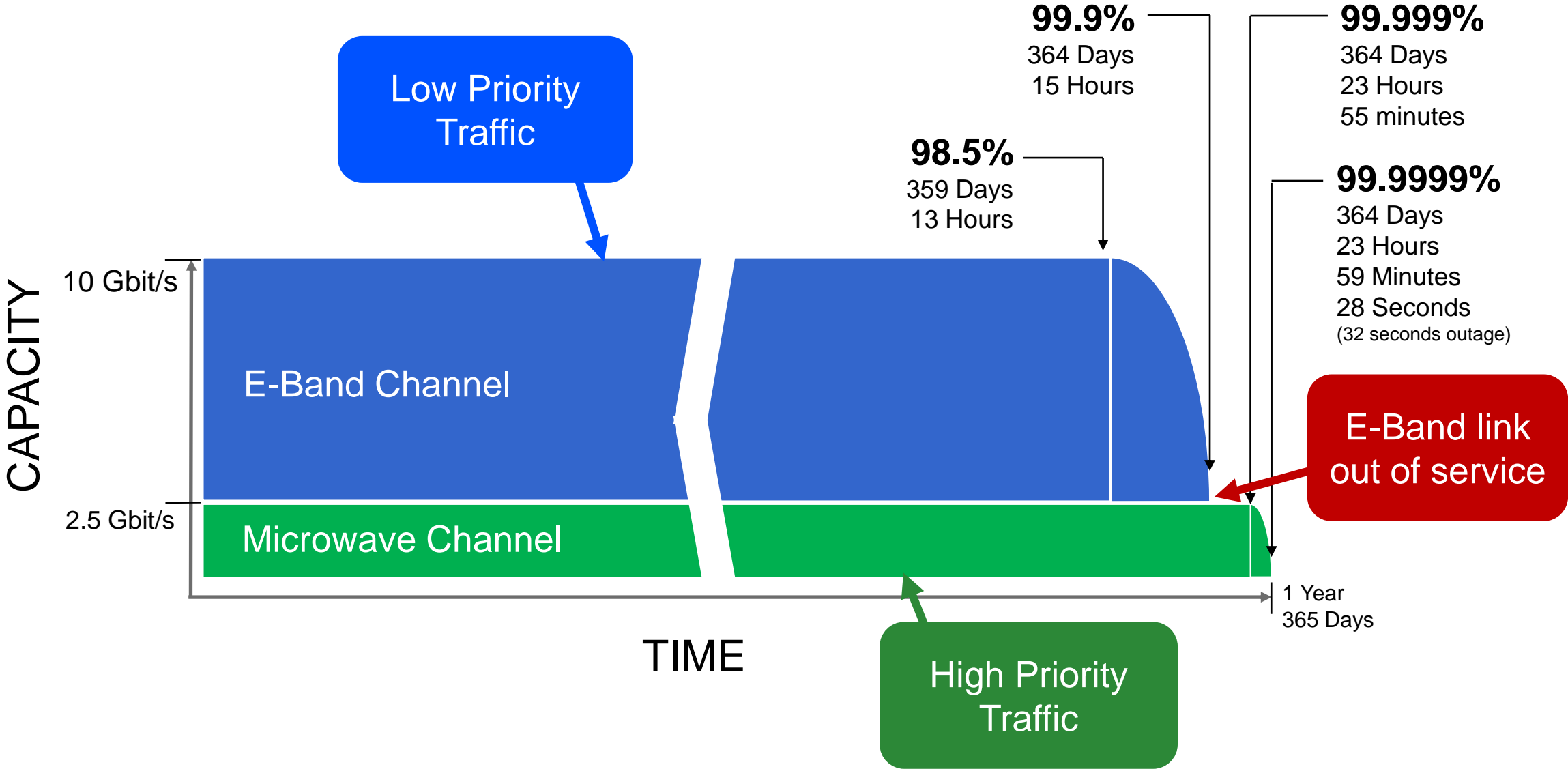
Multi-Band Checklist

(Check all that apply)

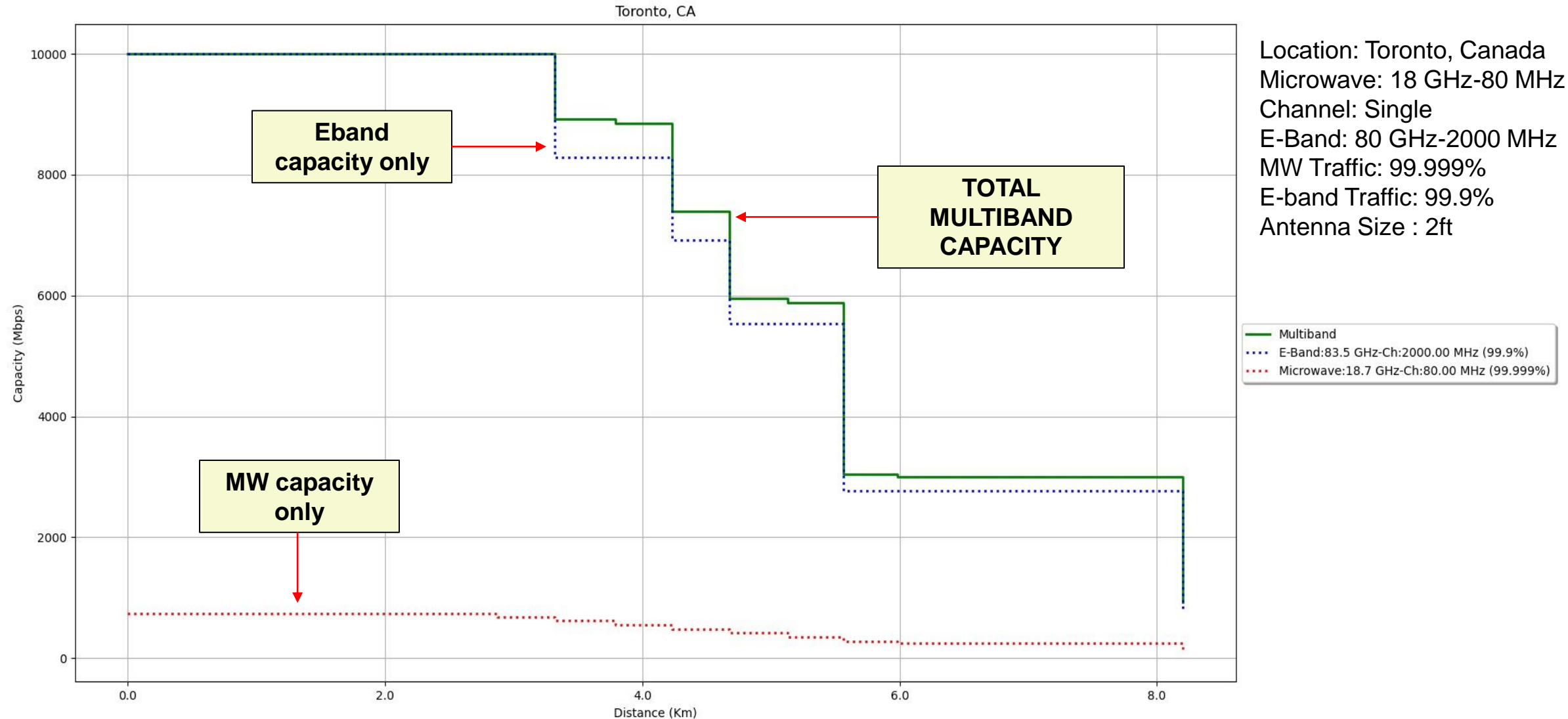
- ☐ Backhaul capacity demands are rapidly growing in my Network
- ☐ I pay high spectrum fees for my microwave links
- ☐ Obtaining more/wider microwave channels is a big problem
- ☐ I don't have access to affordable fiber alternatives
- ☐ E-Band is available, and the spectrum fees charged are (much) lower
- ☐ Many links in my network are less than 10 km

If you checked more than one,
then Multi-Band can reduce your backhaul TCO

PROTECTING HIGH PRIORITY TRAFFIC



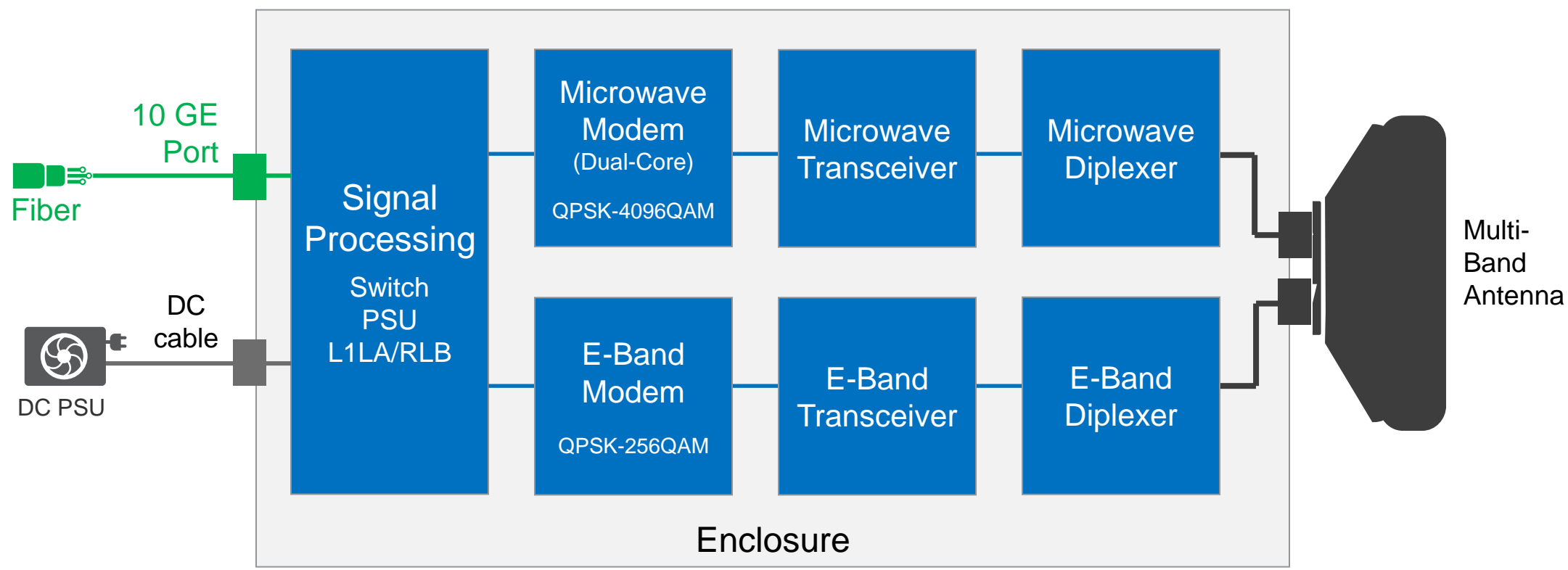
MULTIBAND CAPACITY AND DISTANCE



TIME IN MODULATION – MMW (8KM PATH)

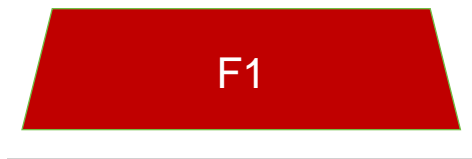
			TIME IN MODULATION			
MODULATION	CAPACITY (Mb/s)	AVAILABILITY (%)	DAYS	HOURS	MINUTES	SECONDS
64QAM	8293	99.59873	363	12	50	55
32QAM	6911	99.77189	0	15	10	7
16QAM	5528	99.85455	0	7	14	27
QPSK	2763	99.93992	0	7	28	42
QPSK_BR12	1628	99.94373	0	0	20	1
QPSK_BR14	814	99.97354	0	2	36	40

WTM 4800 MULTI-BAND ARCHITECTURE



WTM 4800

Dual-Channel Multi-Band



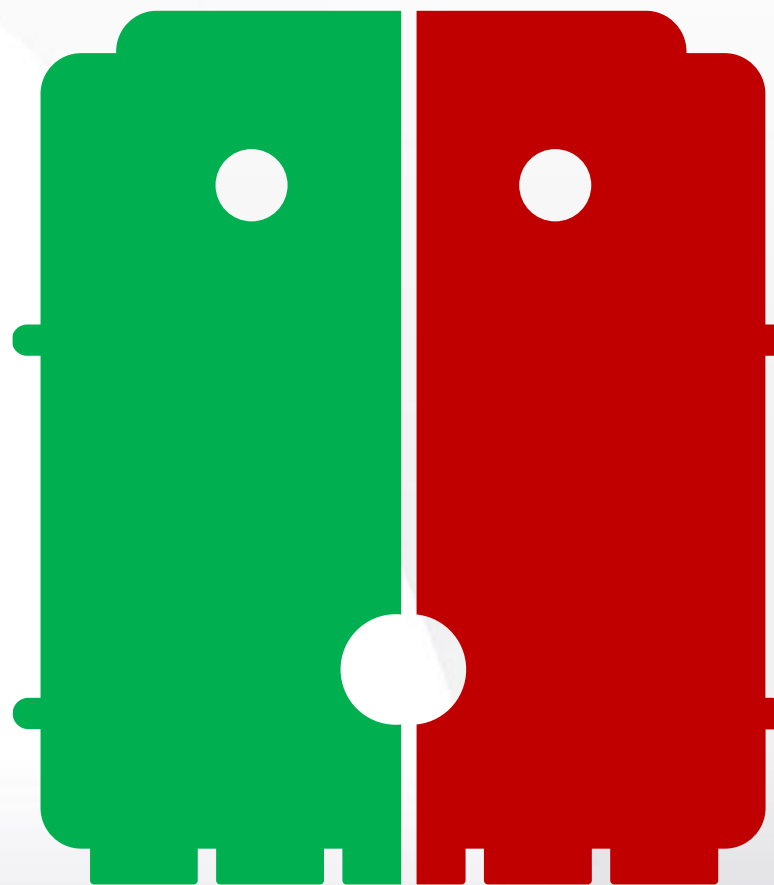
Band 1

E-Band: 80 GHz
Up to 2000 MHz channel



Band 2

Microwave, eg: 15 GHz
Up to 1x 112 MHz channel



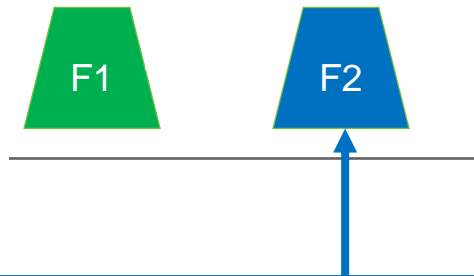
WTM 4800

Tri-Channel Multi-Band, with A2C+



Band 1

E-Band: 80 GHz
Up to 2000 MHz channel

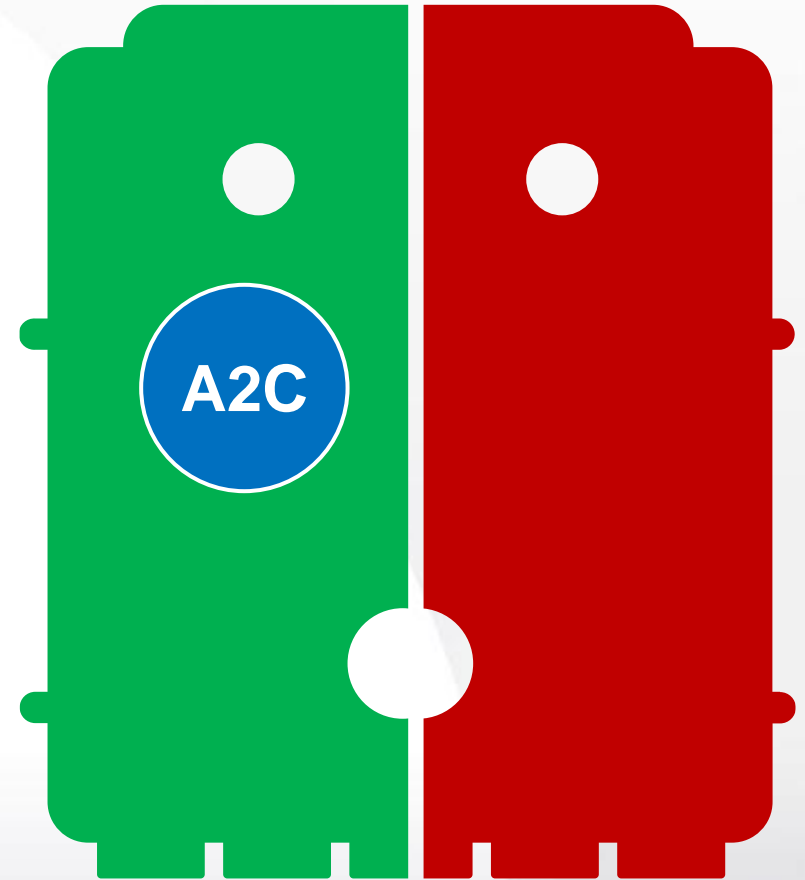


Band 2

Microwave, eg: 15 GHz
Up to 2x 112 MHz channels

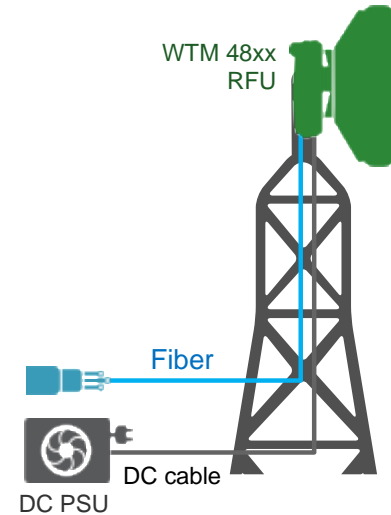
Enable 2nd Microwave channel

- Same bandwidth as first channel
- Same polarization, either adjacent channel or separated up to width of diplexer



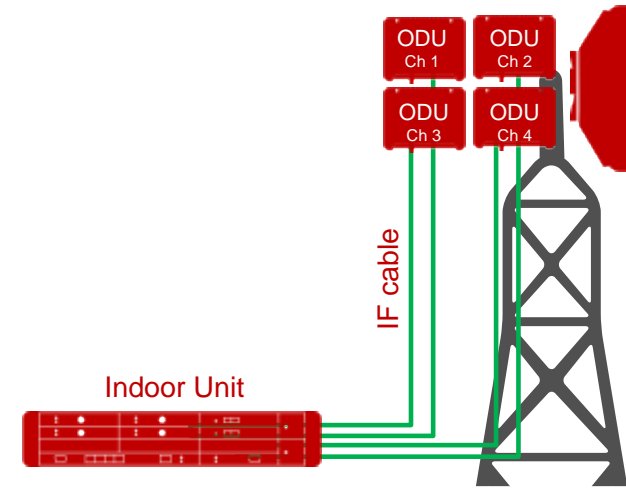
One Box

Aviat WTM 4800 Multi-Band



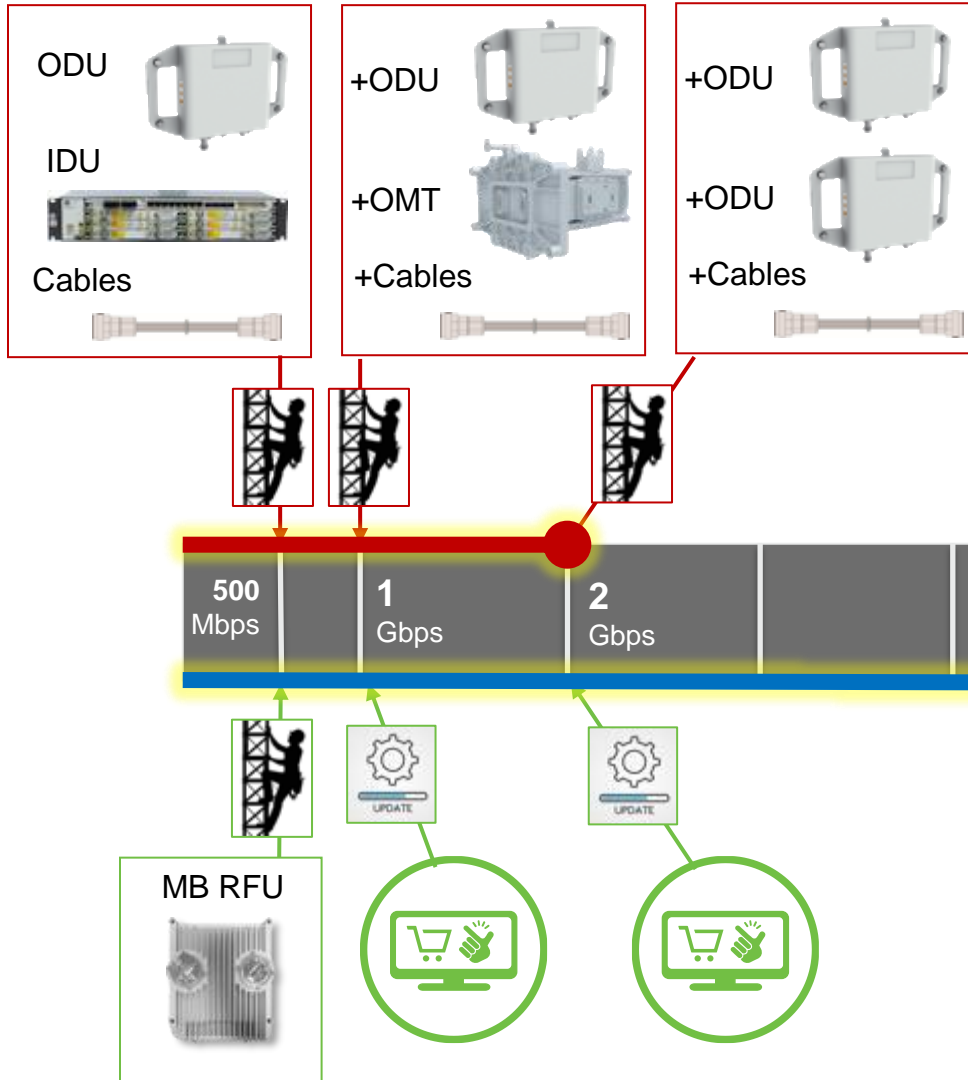
Many Boxes

Multi-Channel Microwave or Multi-Band



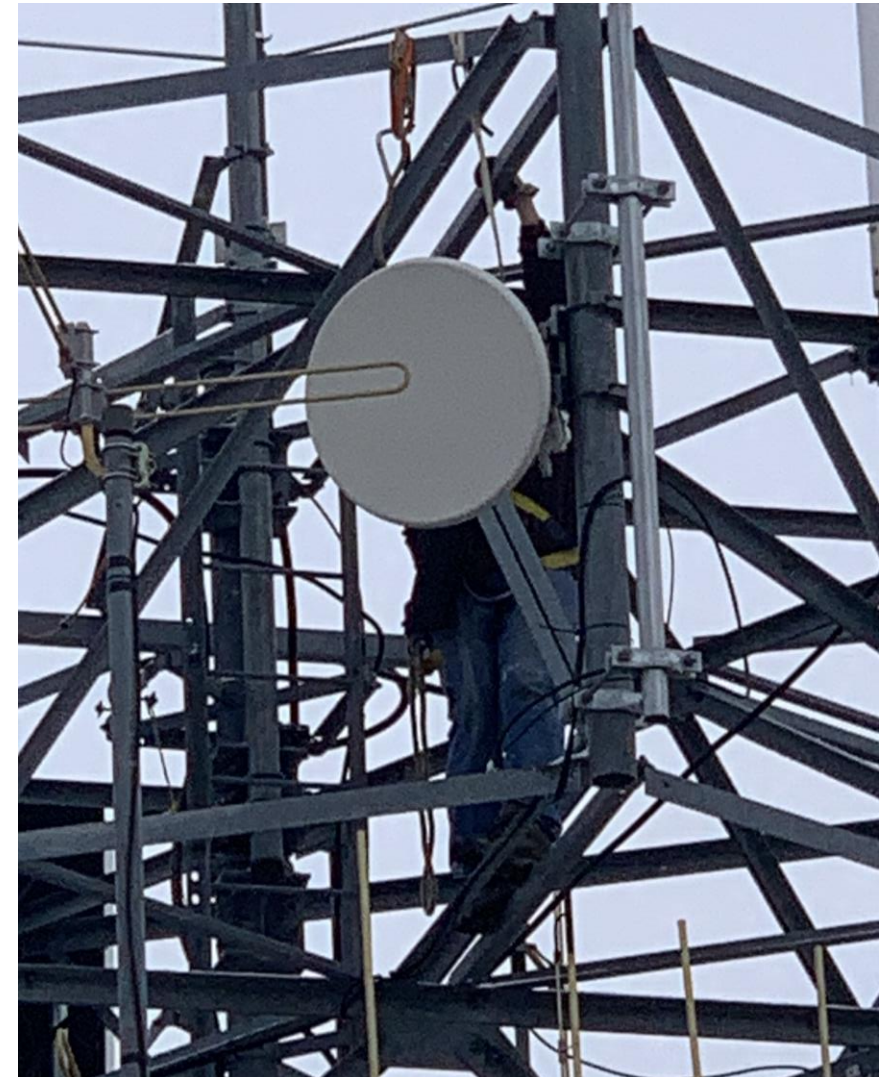
	Aviat One-Box	Multi-Box Solutions
CAPEX	LOWER	HIGHER
Tower costs	LOW	HIGH
Power consumption	LOW	HIGH
Installation	SIMPLE	COMPLEX
Operations	EASY (one device)	COMPLEX (many devices)
Capacity upgrades	EASY (on-demand via Aviat Store)	COMPLEX (long ordering & delivery process)

CAPACITY UPGRADES – MICROWAVE VS MULTI-BAND



WICKED FAST INTERNET, PARK CITY USA

- WTM 4818 18/80 GHz Multi-Band link deployed in Park City Utah
- 9.4 km (5.9 mi) link
- Connects a WISP PMP hub back to a fiber connection POP
- 10 Gbps capacity – more than 20x the microwave link it replaced
- Link has performed flawlessly even during heavy snowstorms (7.5 cm/hr)



Aviat Design

Plan your Microwave, E-Band and Multi-Band links in the cloud

Now supporting MIMO

AviatCloud

Design

Project Overview

Project Sharing (New)

Projects

Design - Project

BasicAdvanced

Sites:

T0185T0235

Radio Template :

TFixed-MB-80GHz/15GHz-WTM48XX-NP-1000.00/56.00MI

Select here to see how to create new template

Distance (Km):

5.24

Antenna:

DiameterMulti-Band Antenna

2Ft | 0.6m2Ft | 0.6m

Multi-band antenna

1515

Height (M):

(M):

Auto Antenna Height

Estimate Antenna CLCalculate

Received Signal (dBm)	Capacity (Mbps)	Availability (%)	Frequency Band (GHz)	Outage Time per year (Days HH:mm:ss)
-34.44 dBm	415	99.99897	15 GHz	000 00:05:24.82
-32.84 dBm / -34.44 dBm	4915.0	99.9815312096	80 GHz/15 GHz	000 10:22:40.32

Transmission

SaveReportContact Us

Sites:

7245 ft Belmont Mtn.Wirth Ranch

Ground Elevation (Ft):

7,336.05,150.9

Main Antenna Height (Ft):

5933

Auto Antenna Height

MIMO Antenna Height (Ft):

5933

Main Antenna Vertical angle (*):

-1.281.05

MIMO Antenna Vertical angle (*):

-1.281.05

Tower height (Ft):

150150

Azimuth (*):

30.93211.09

K Factor:

1.33

Clearance Criteria

F1 Clearance (%):

0.6

Terrain Roughness (Ft):

Annual Multipath + Rain (%):


Calculate

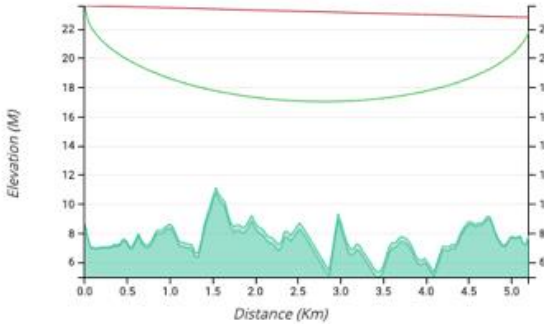
Complete

Km / m / °C

DEC

SimpleMapSatellite





Details

Sign up now and use it for free at aviatcloud.com



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