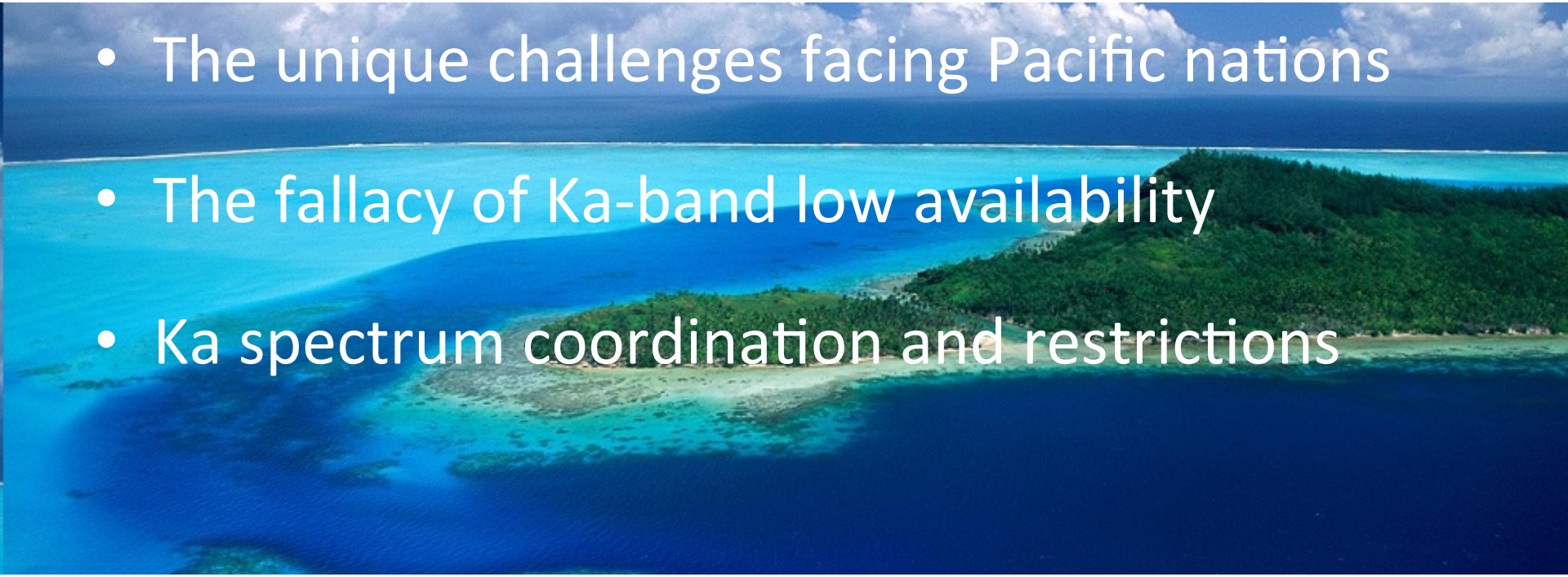
Ka-band spectrum use in the Pacific

Christian Patouraux
Kacific Broadband Satellites

ITU seminar
Fiji July 2015





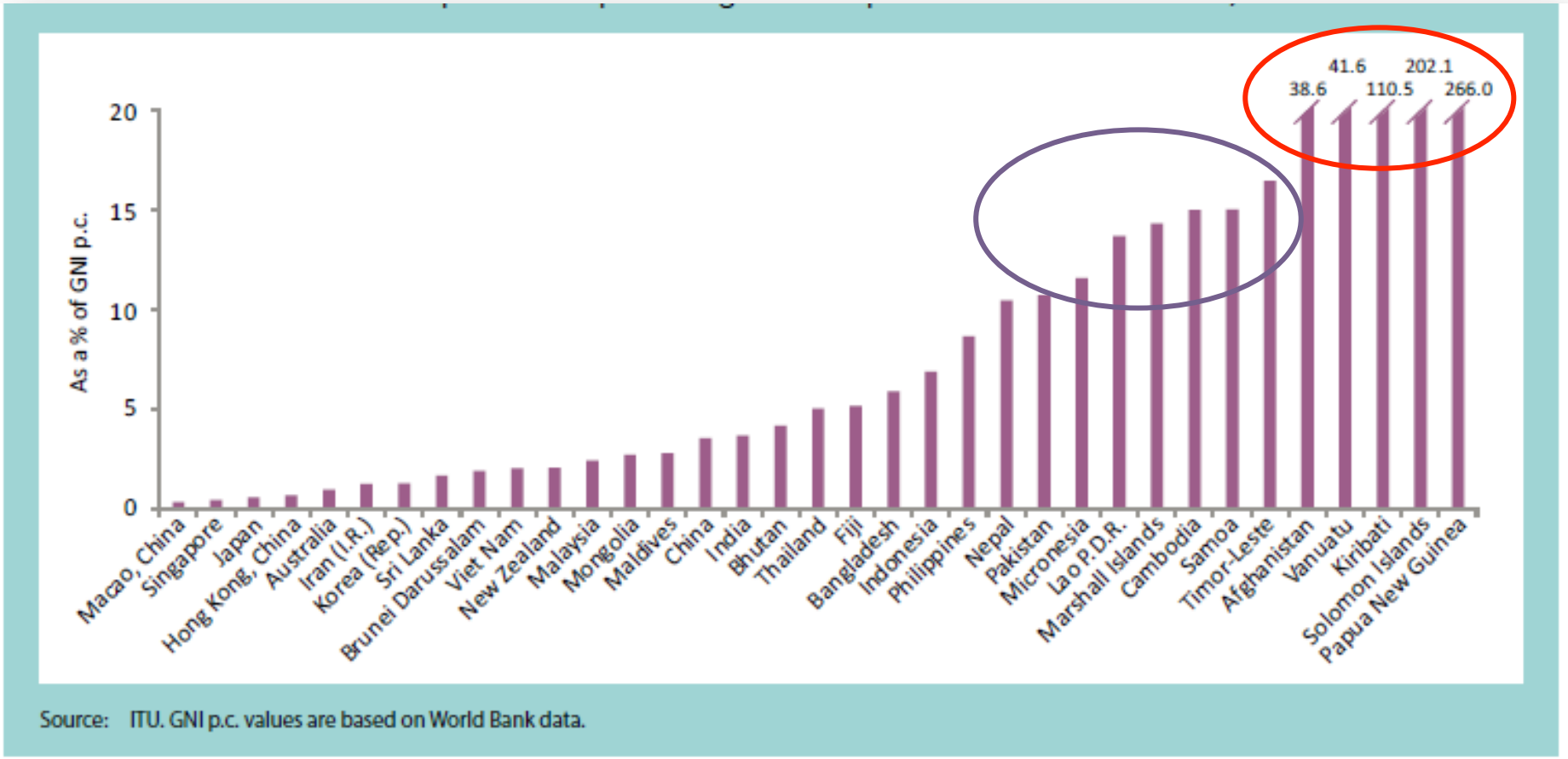


- The unique challenges facing Pacific nations
- The fallacy of Ka-band low availability
- Ka spectrum coordination and restrictions

- The unique challenges facing Pacific nations

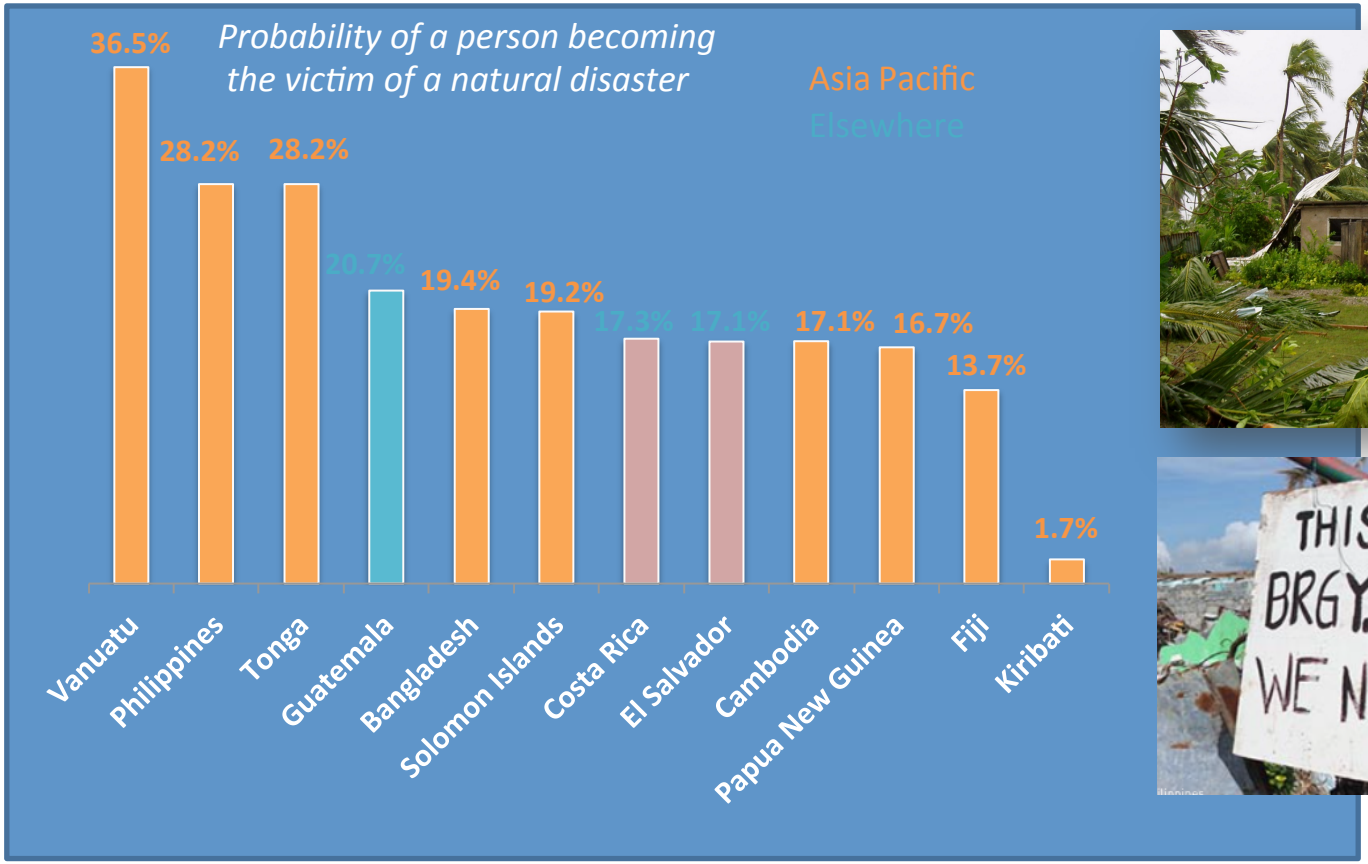
Digital divide is today's reality in the Pacific

Fixed broadband prices in Asia and the Pacific as a percentage of GNI per capita 2008-2013



Source: ITU. GNI p.c. values are based on World Bank data.

Communication recovery key to alleviate regional disasters



"When we went to the evacuation centres we were so shocked - we thought they would need food and water. But **their priority was that they needed to be informed** on what was going on outside the evacuation centre, what the Government and humanitarian agencies were doing for them so they would know where to go."

Olive Tiu, Regional Director of the Philippines Information Agency based in Tacloban (2014)

The digital dividend of spectrum use for broadband internet

"Without broadband, it is clear that we will never meet our development goals on time. Broadband is a key element for progress in all countries and has already become a critical national infrastructure, like transport and other public utility networks."

Brahima Sanou Director, ITU Telecommunication Development Bureau*

"Broadband is a catalyst for advancing sustainable development. Satellites play a crucial part in providing broadband access to vulnerable areas so that the regional vision of ICTs for all can become an achievable target."

Samoan Prime Minister Tuilaepa Lupesoliai Sailele Malielegaoi *

Addressing an urgent need

Kacific has designed its service to meet this urgent need of affordably connecting entire island populations

Source: *Measuring the Information Society* ITU, 2014

Image: *Radio Australia*

Pacific countries: Ka-band fixing the capability issue

Source: *Measuring the Information Society*
ITU, 2014

Image: *Radio Australia*

Ka-band satellite broadband key for the development of the Pacific

Small, simple, high-throughput

Big, complex, power-hungry

The combination of low-cost terminals and lowest cost bandwidth addresses best the needs of island nations for Universal Access

Connecting communities and local economy

Turnkey Wholesale Service (VNO model)

Accessible overnight in every single island of the Pacific

1.5$ per GByte

20-40Mbps per site

Our capacity offer

1 user: $10/month

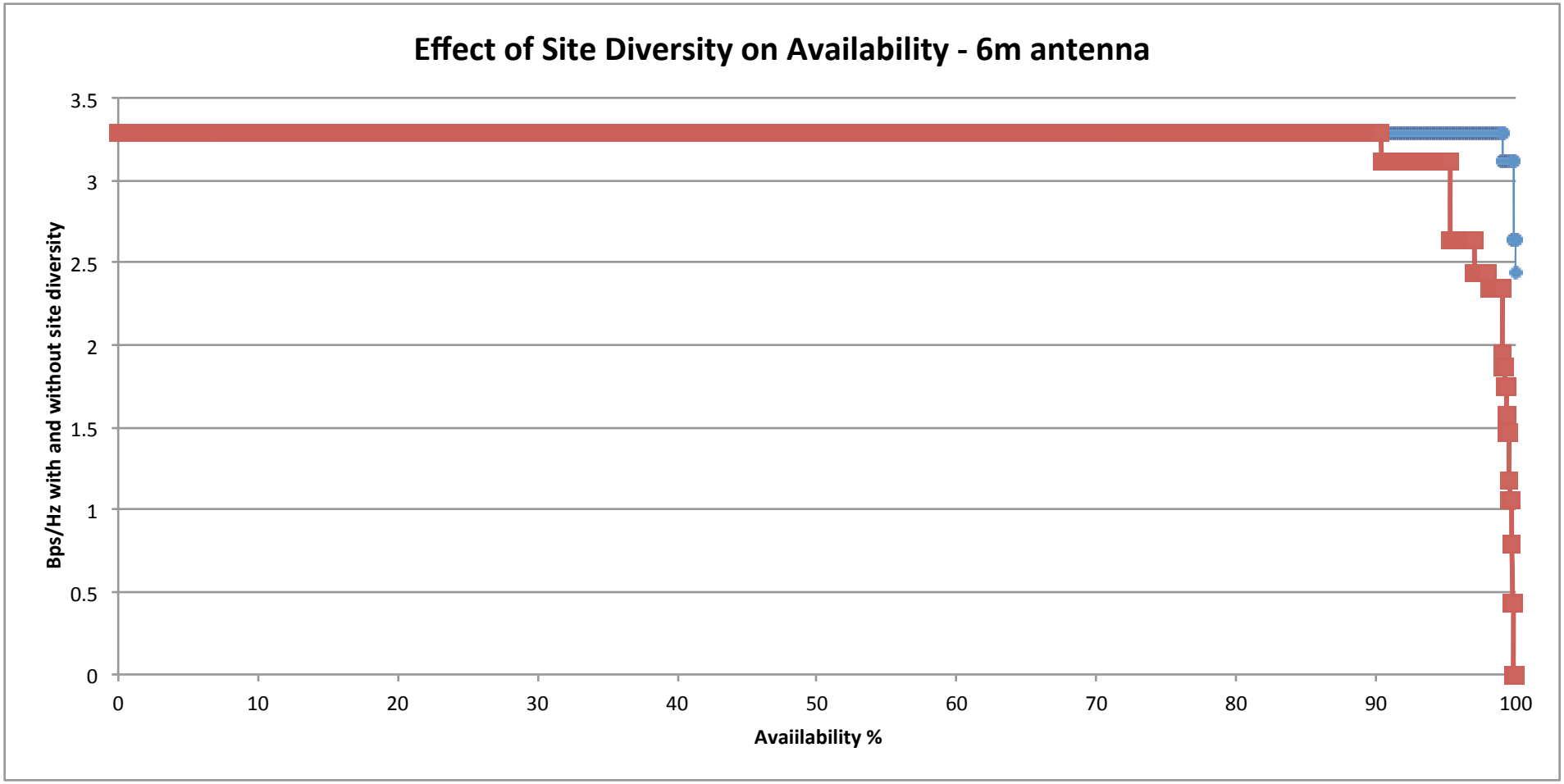
2,500 internet pages per month

26h youtube videos per month

Our value proposition

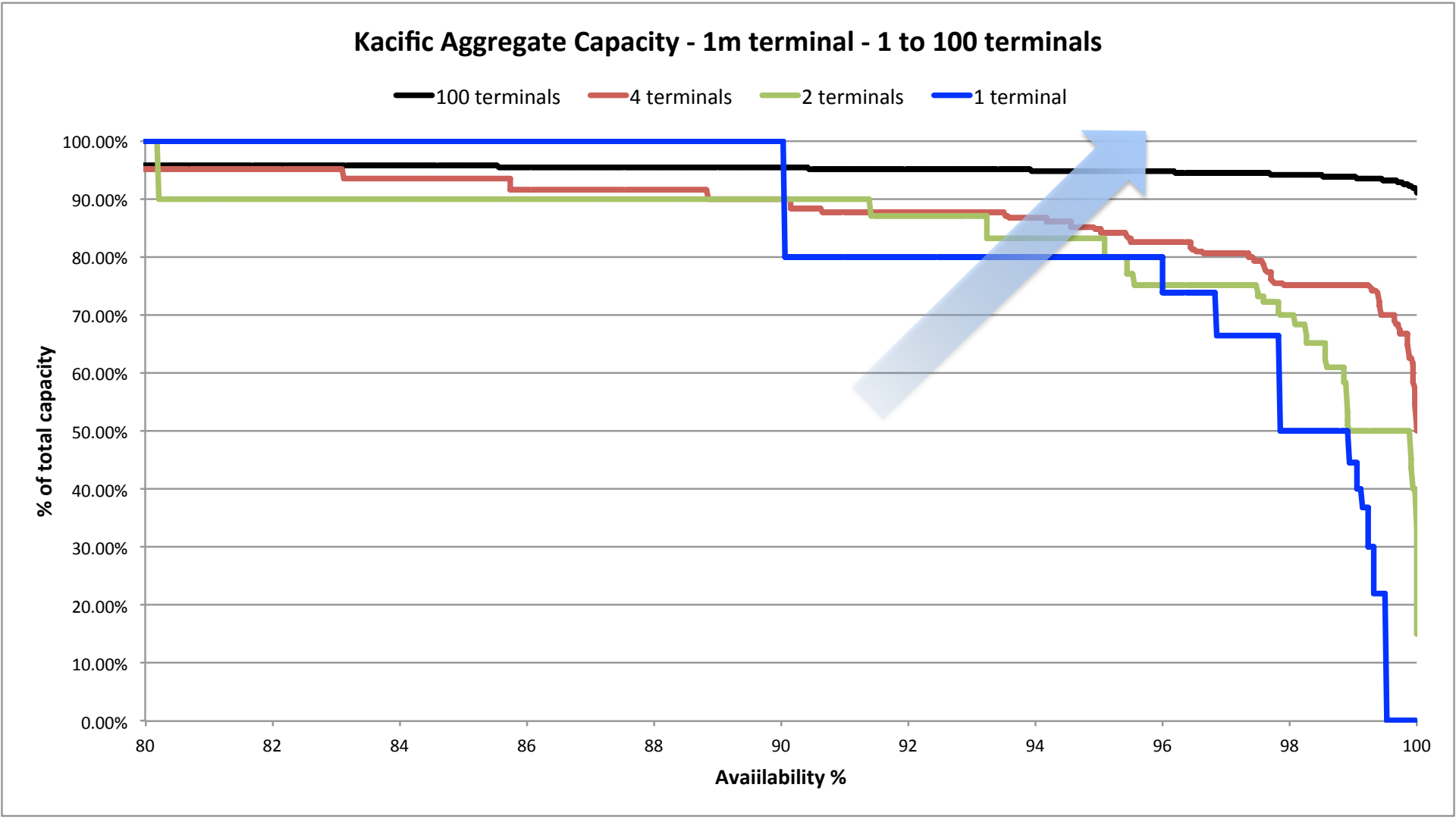
- The fallacy of Ka-band low availability

Ka-band teleport in equatorial region



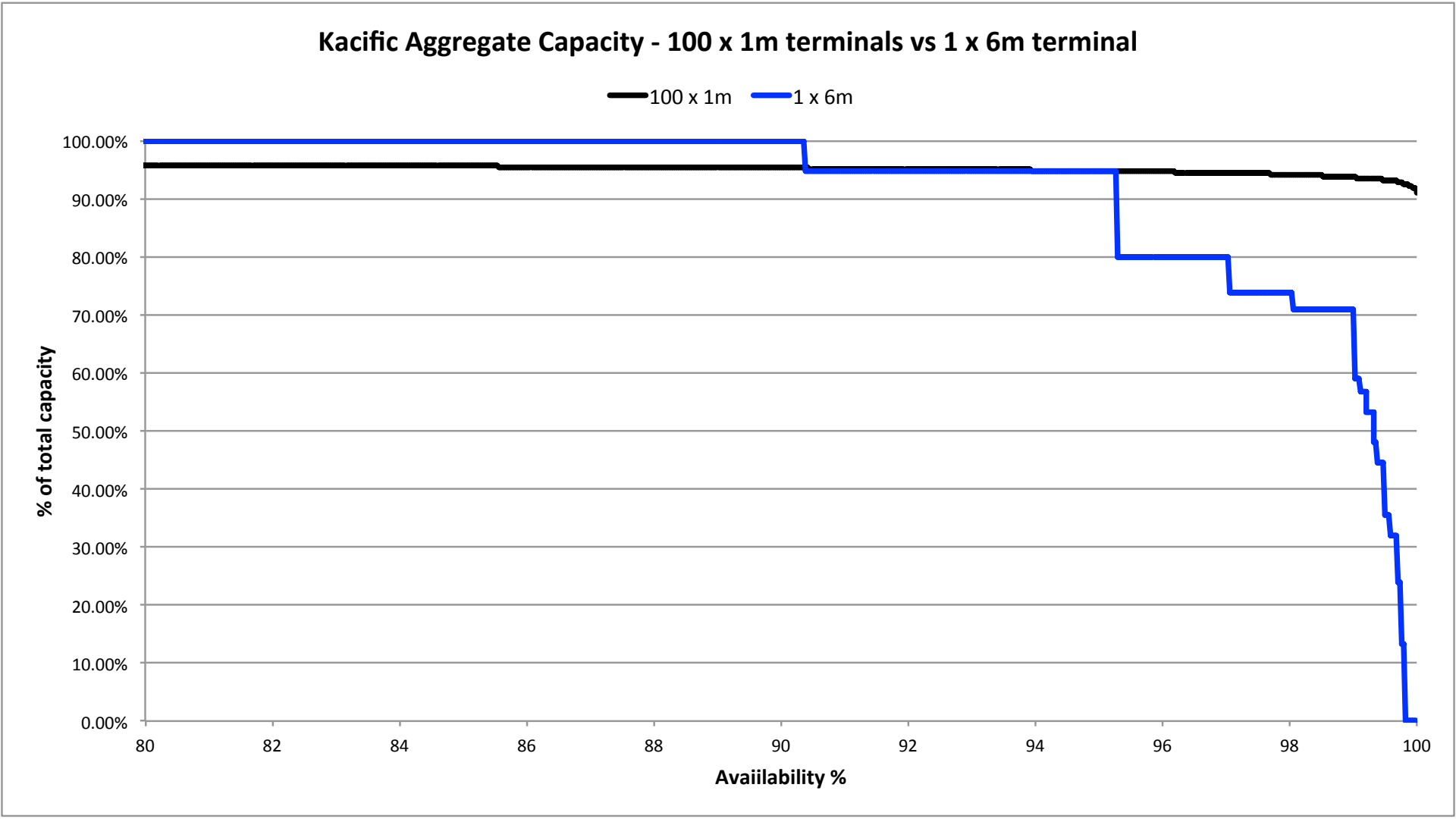
- Ka-band Teleport can easily operate in tropical region using 50km site diversity

Dissemination of small VSAT = aggregate resilience



- Large number of small VSAT have built-in site diversity
- The aggregate network delivers **a smooth and stable** bandwidth

VSAT – a superior value proposition to Trunking

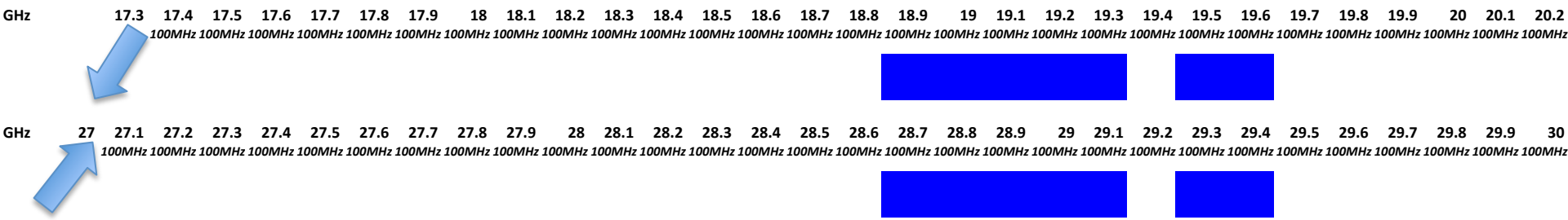


- Large network of VSATs brings much higher population utility than localized trunking
- 1 x 6M antenna = ~US$500k + US$ Millions in distribution / 100 x 1m = ~ US$70k

- Ka spectrum coordination and restrictions

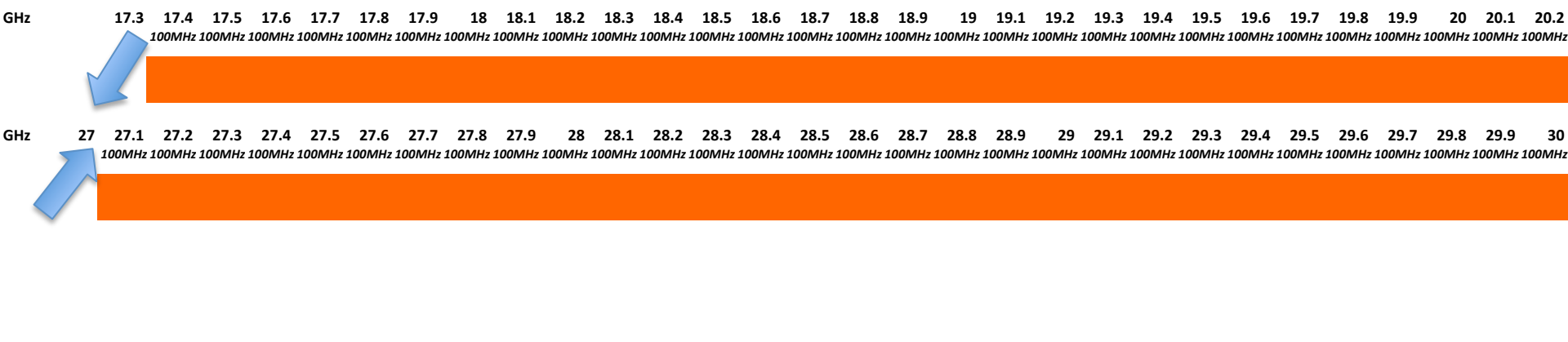
Sharing with NGSO

- **18.8 –> 19.3 GHz / 28.6 –> 29.1GHz**: 500MHz up and down that today require coordination with O3b worldwide based on slots priority and within +/-6 or more degrees of equator. Used for O3b service beams.
- Technically, Geostationnary Ka-band could be reused every ~4degrees = up to 90 x frequency reuse of the spectrum around the planet
- NGSO would be challenged to achieve this number of ~90 spacecraft in one equatorial constellation
- GSO Ka-band teleport do work very well within the equatorial band (eg IPStar)
- **19.4 –> 19.6 GHz / 29.1 –> 29.3GHz:** 200MHz up and down that require coordination with Iridium. Used for Iridium gateways – facilitated by localized Iridium gateways



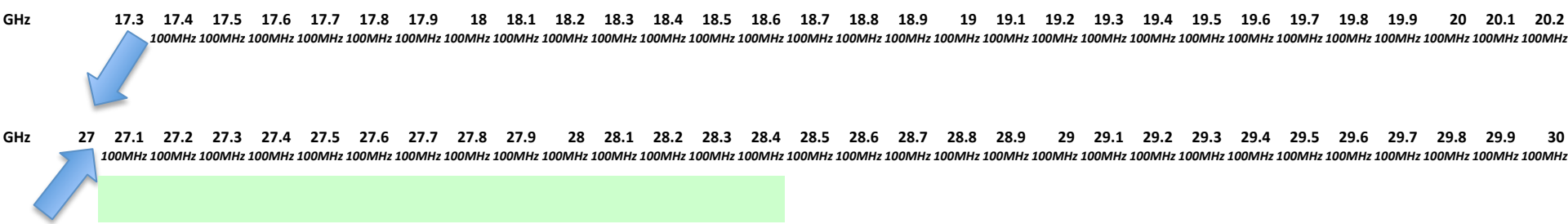
Sharing with terrestrial

- Some Pacific countries see Ka-band an option to relief the terrestrial pressure on C-band or even still consider Ka-band an “experimental”, “unproven” band, despite is well demonstrated development and operations in USA, Europe, Middle East
- Disseminated Ka-band VSAT is THE solution for the disseminated Pacific
- Opening the full **17.3->20.2GHz / 27.0->30.0GHz** to spectrum to terrestrial, despite most of it being allowed by ITU, potentially endangers the formidable utility that Ka will bring to the population of those countries



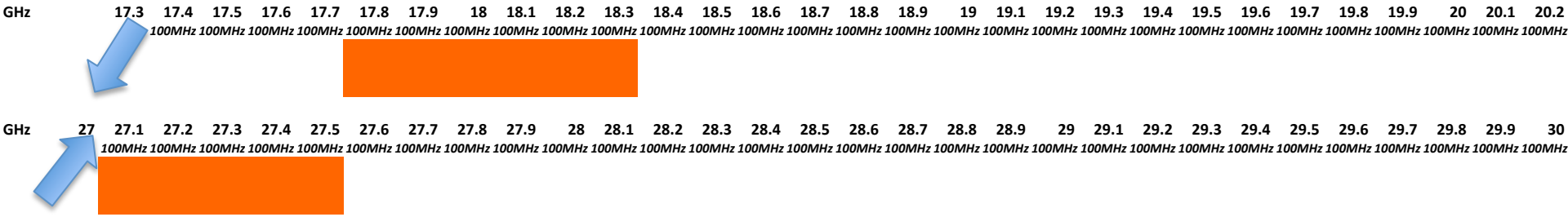
Auctioned Spectrum in New Zealand

- **27GHz -> 28.35GHz:** ~50% of the uplink Ka-band was auctioned to Vodafone New Zealand on 15 January 1998 and will own management rights on this spectrum until 14 January 2018
- In 1998, Ka-band was undeveloped and the auction was understandable
- Today, New Zealand lends itself as a natural, well fibered, Ka-band teleport location in the Pacific
- Opening this band after January 2018 to share with satellite uplink would be advisable

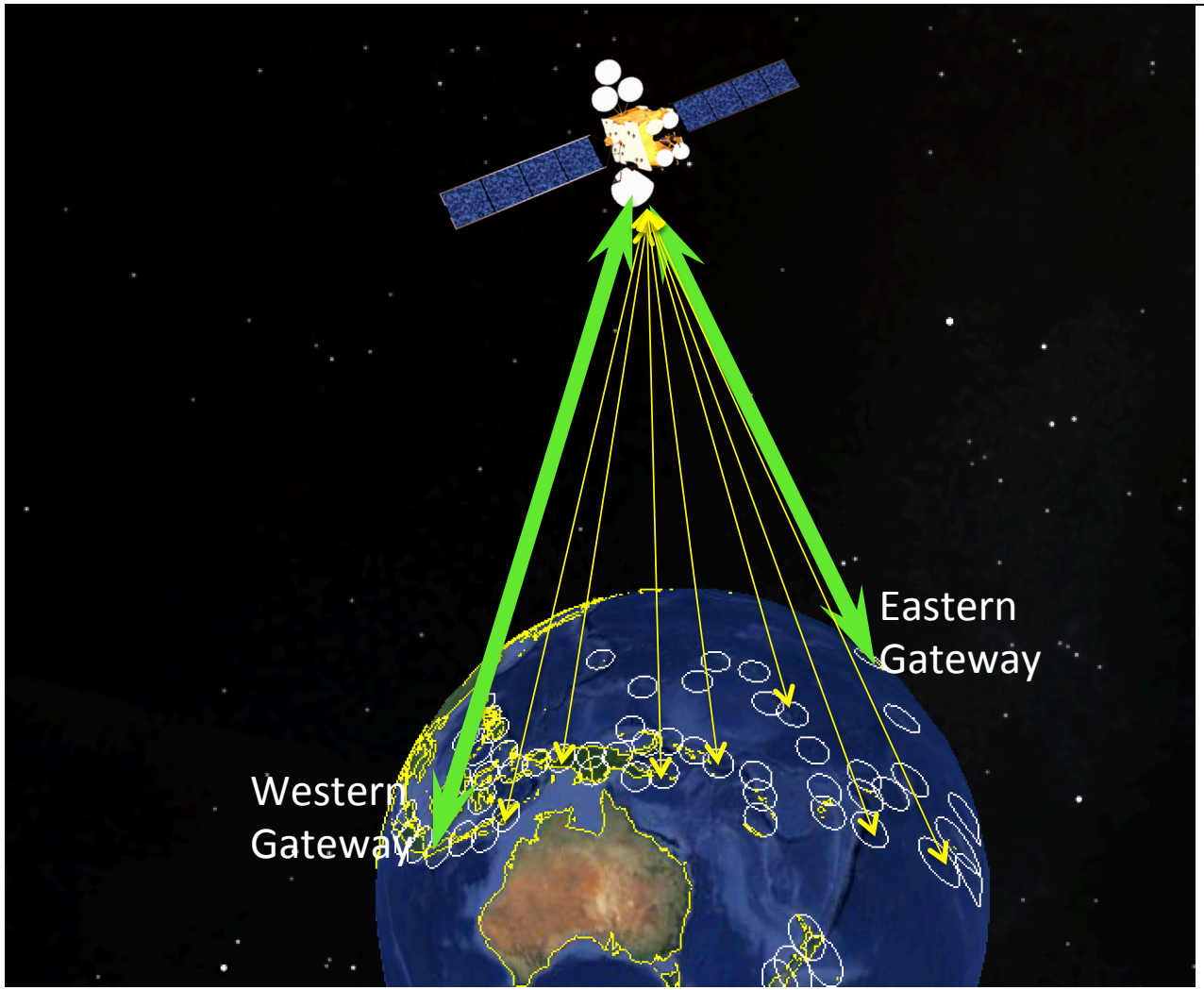


FCC restriction on Non-Federal Ka-band

- **17.7GHz -> 18.3GHz** : 600MHz dedicated to fixed services
- **27.0GHz -> 27.5GHz** : 500MHz dedicated to inter-satellite services
- Makes US / FCC regulated territories - based gateways less attractive due to parts of Ka spectrum unavailable



Affordable internet in the Pacific requires maximum Ka spectrum



Impression of Ka-band satellite service architecture over the Pacific

Access to large amount of Ka spectrum is paramount to reducing costs of bandwidth served by Geostationary satellites, **otherwise**: multiplications of gateways (antennas, hubs), additional complexity needed onboard, less capacity per beam on reuse frequency schemes, less spectral efficiency due to spectrum cramping between beams leading to suboptimal coverage.

Kacific vision: connecting the dots - soon a reality

TTC, Kacific sign Tuvalu broadband deal

11 Jun 2014

Tuva

Singapo
service
high spe

Kacific seals US$78 million BigNet Indonesian broadband deal

"This is a key milestone for Kacific, and a great promise for Indonesia."

Kiribati signs with broadband provider Kacific

Updated at 9:45 am on 22 October 2014

Kiribati is the latest island nation

The multi-million dollar, five year a broadband services from 2017.

Tokelau selects Kacific to deliver high-speed broadband

Botica Butler Raudon Partners

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Satnews Daily

September 9th, 2014

Kacific Broadband Satellites + ITU—Remote Resources To Be Established In The Pacific (SATCOM)

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Kacific inks satellite broadband agreement with Our Telekom

Published: 14 August 2014

KACIFIC Broadband Satellites yesterday announced that it has signed a five year Framework Services Agreement with Solomon Telekom Company to provide high speed bandwidth to the people of Solomon Islands.

The multi-million dollar agreement almost doubles the bandwidth available to Solomon Telekom and will provide high speed internet coverage to even the most remote locations in the island group.

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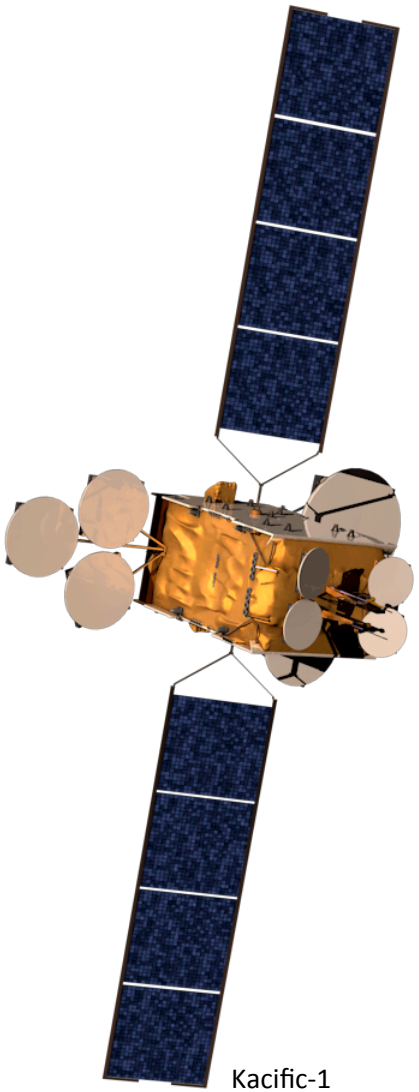
Thank You



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