

Networking The Pacific

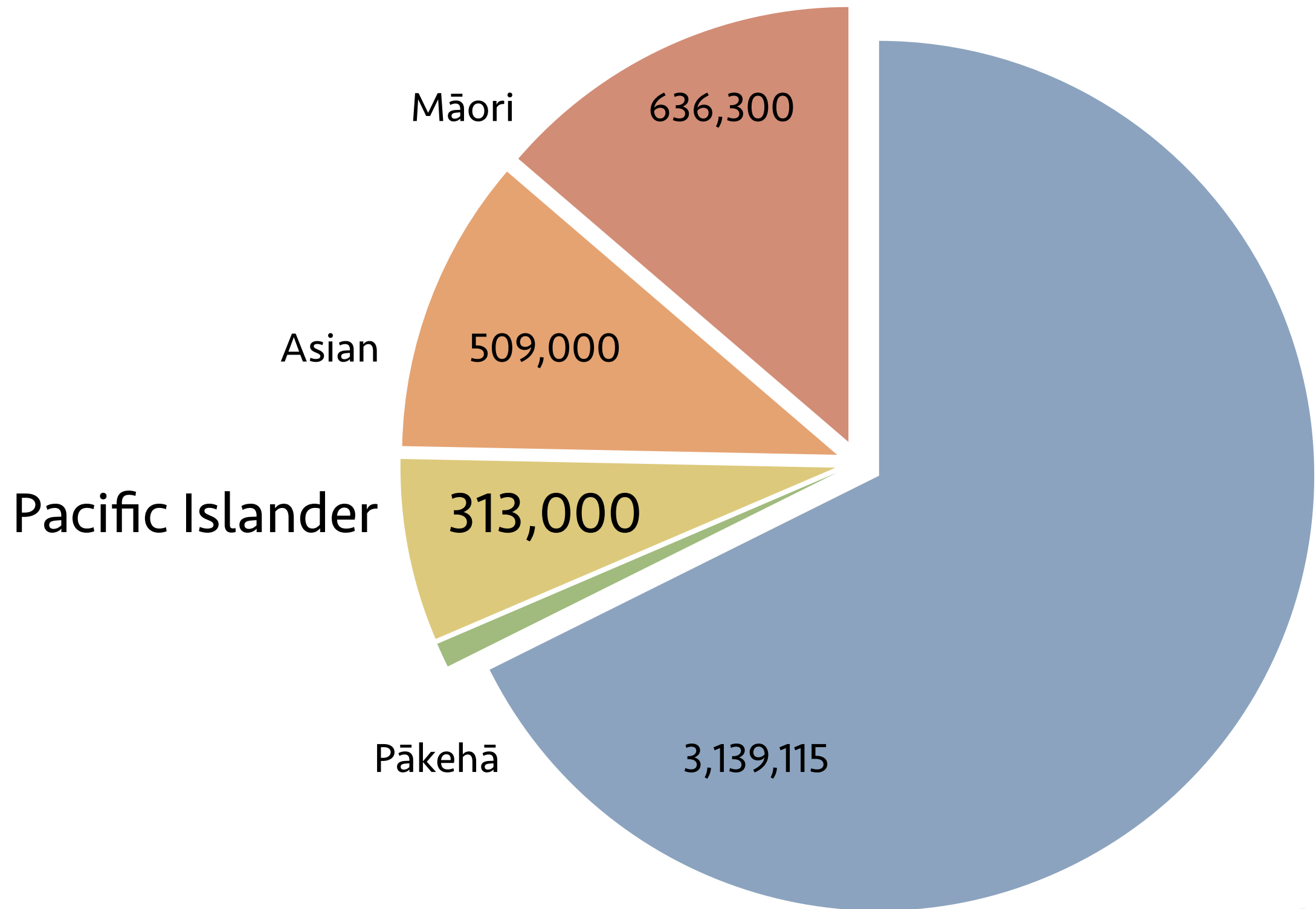
Jonathan Brewer
Network Startup Resource Center
jon@nsrc.org



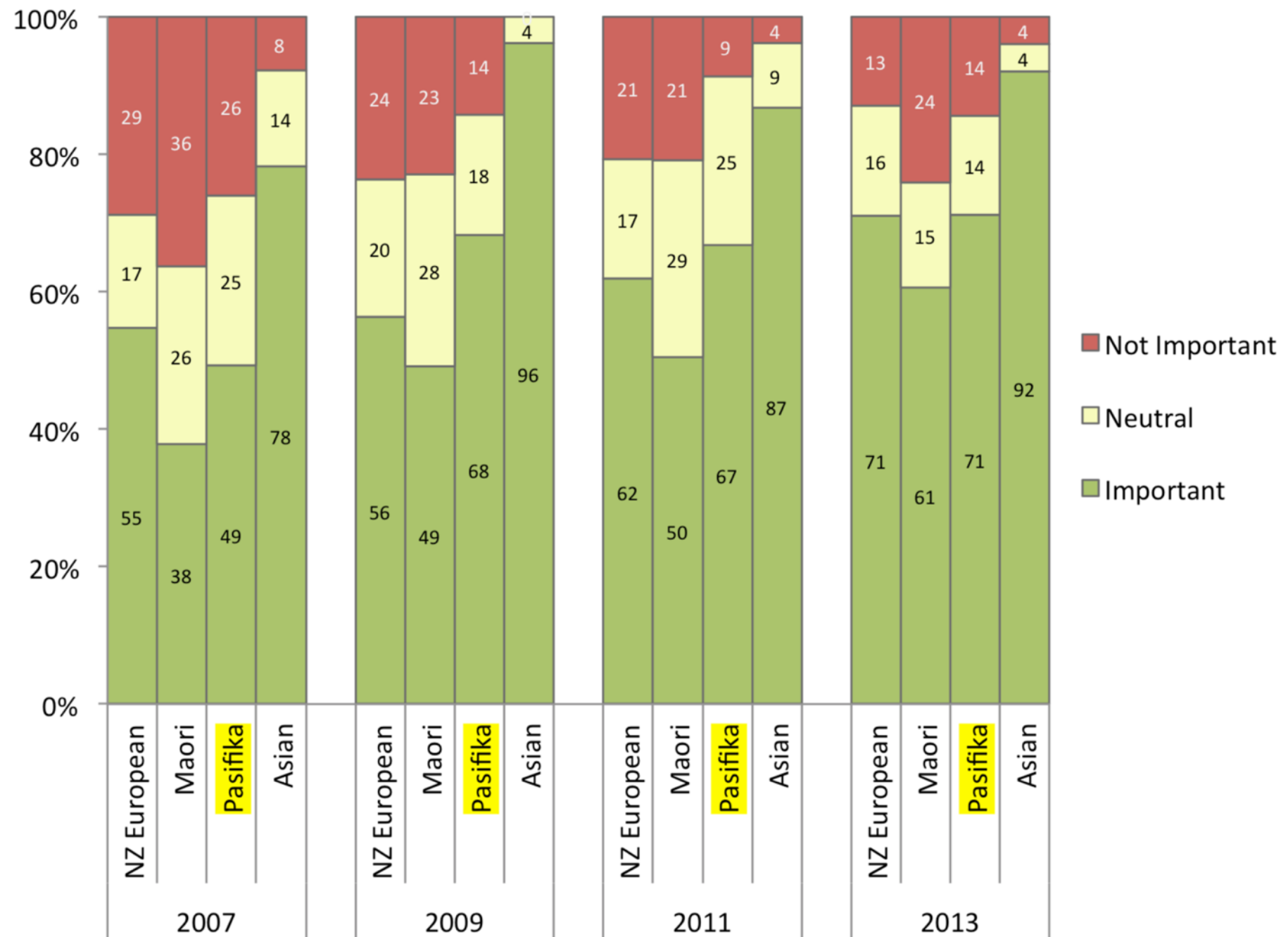
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He tangata! He tangata! He tangata!

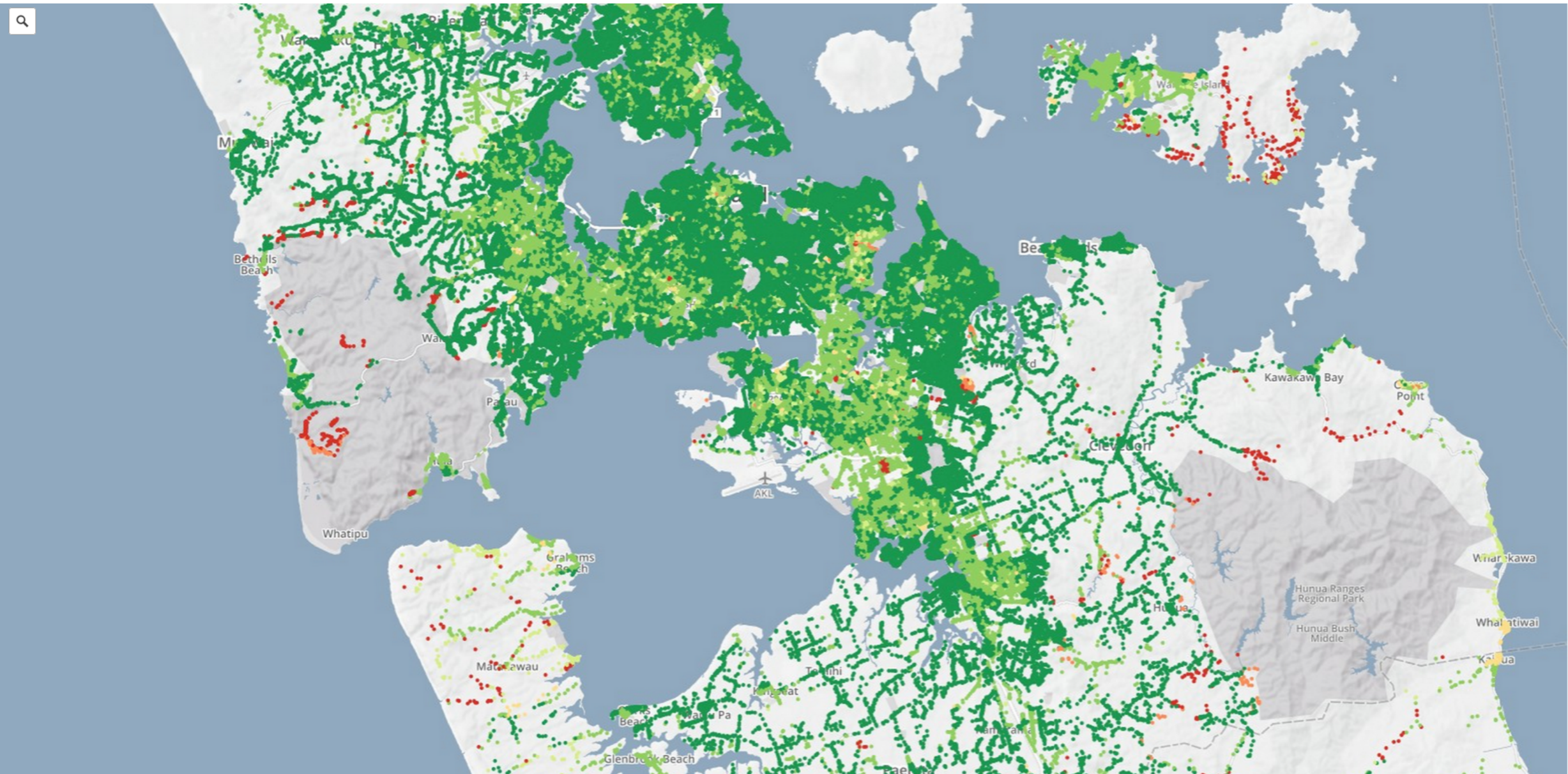


Internet is Important to Pacific Islanders in NZ

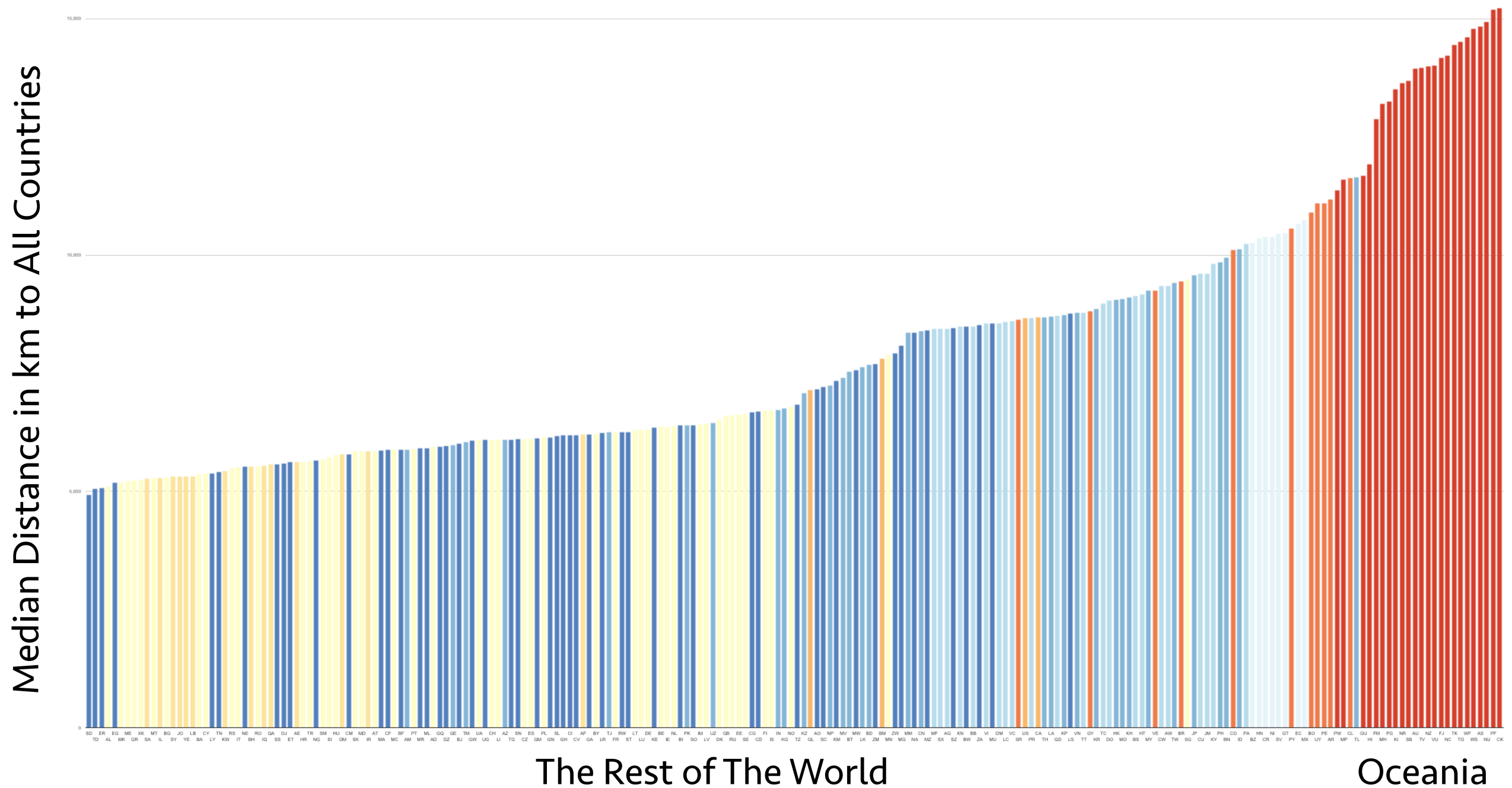


WIP/AUT Internet Trends in New Zealand 2007-2013

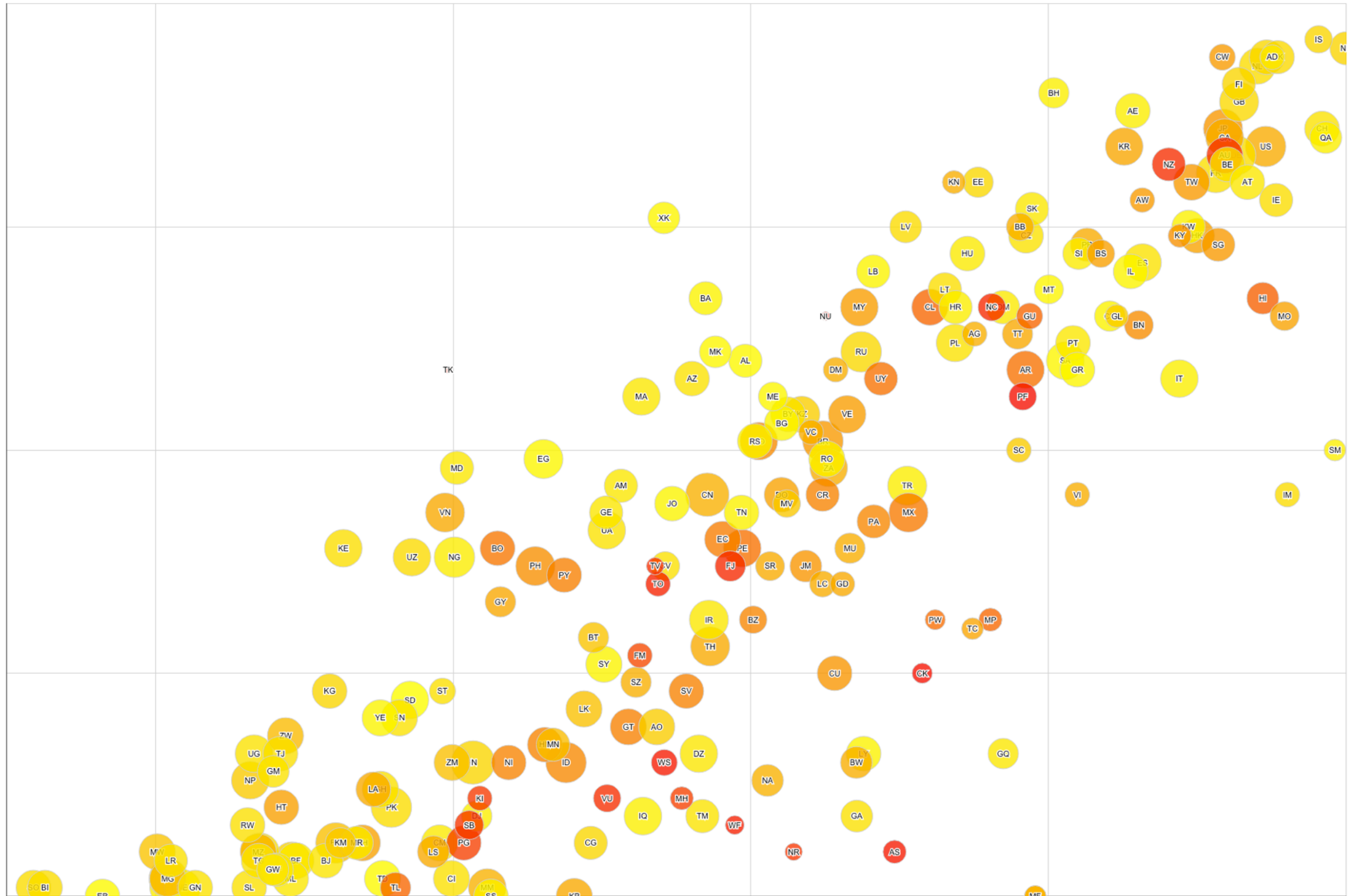
Internet is Affordable for Pacific Islanders in NZ



Pacific Countries Are A Long Way Away

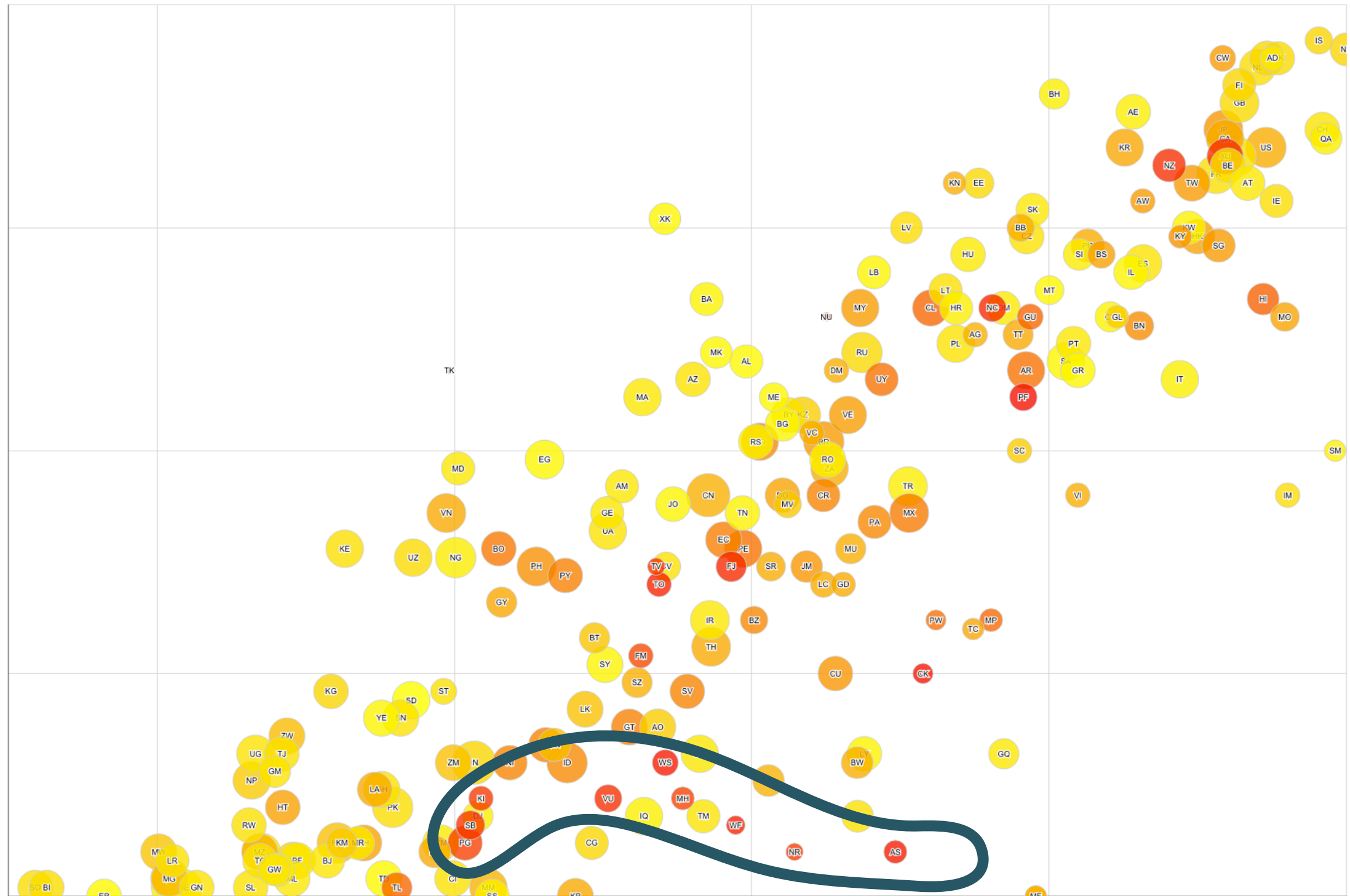


Internet Uptake

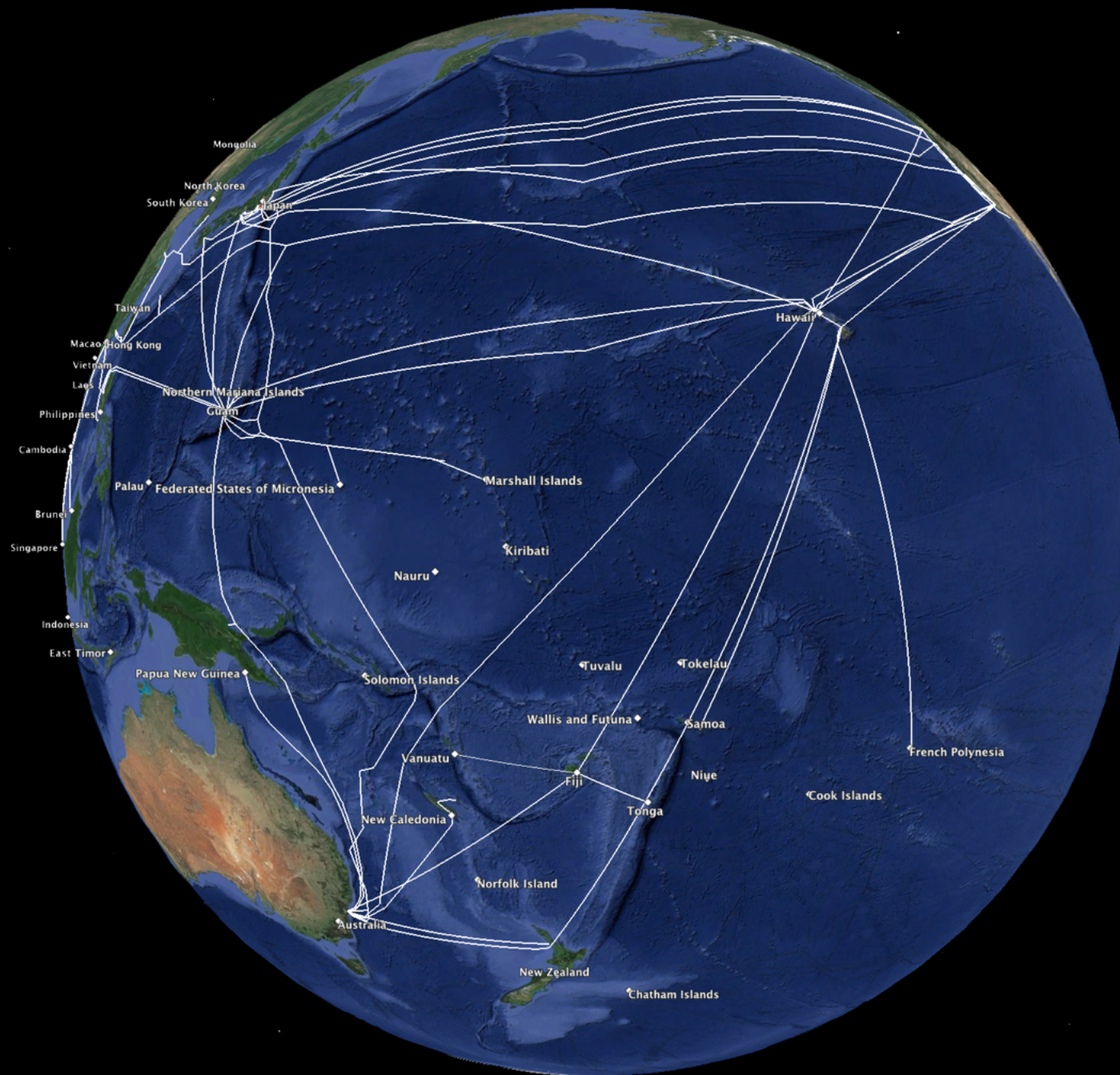


GDP Per Capita

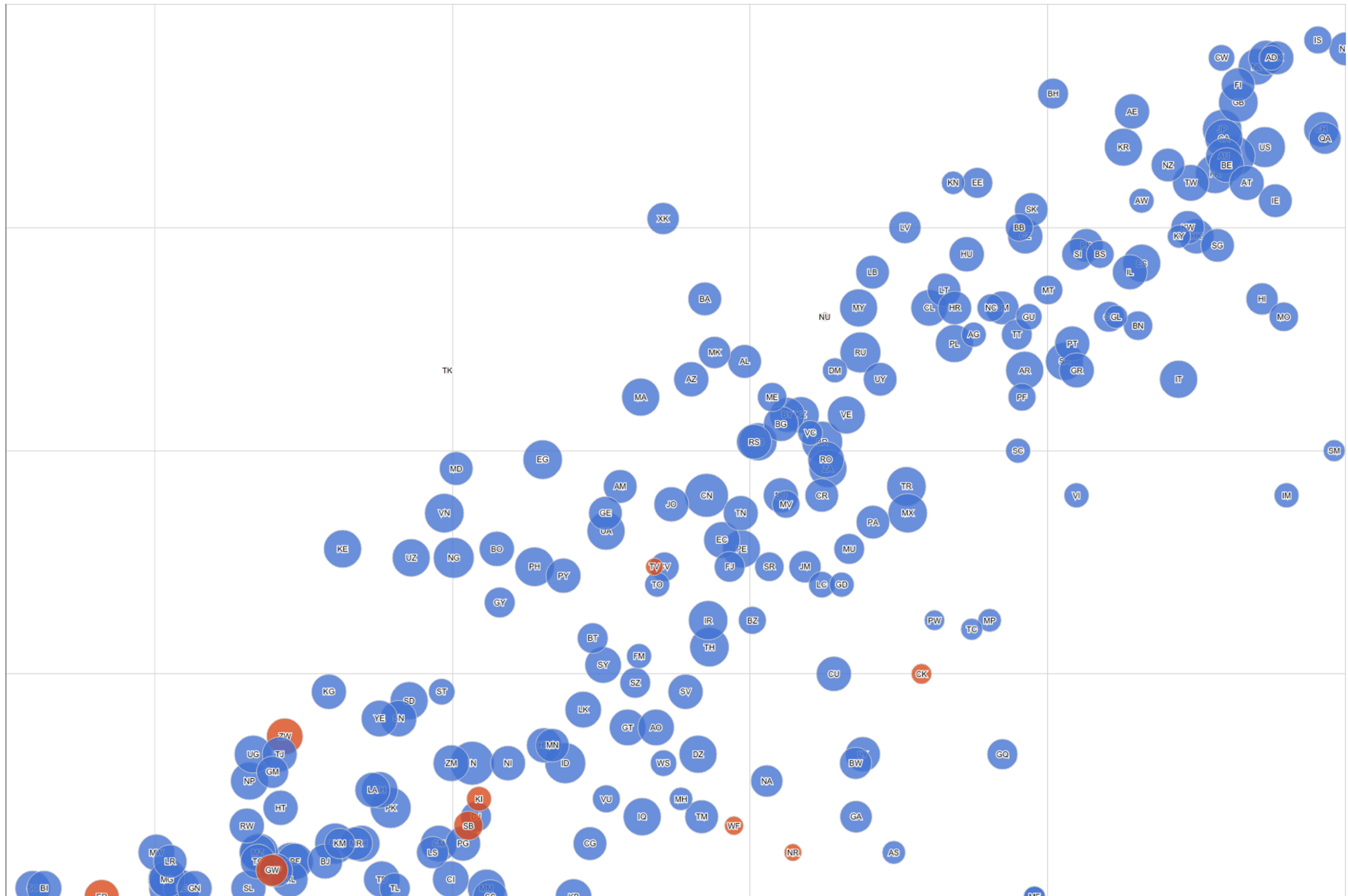
Internet Uptake



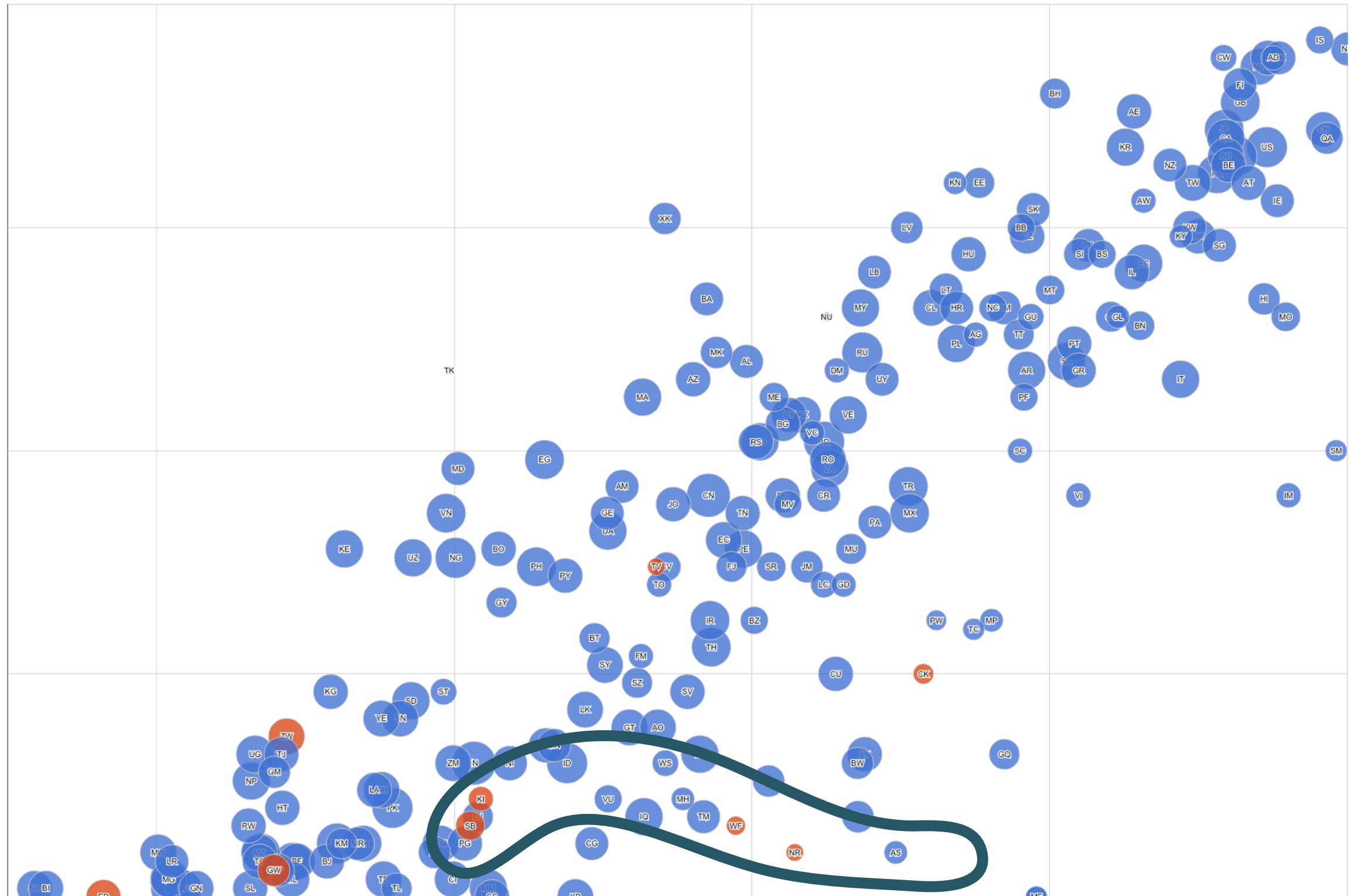
Pacific Islands Submarine Cables



Internet Uptake



Internet Uptake



Look, Up In The Sky



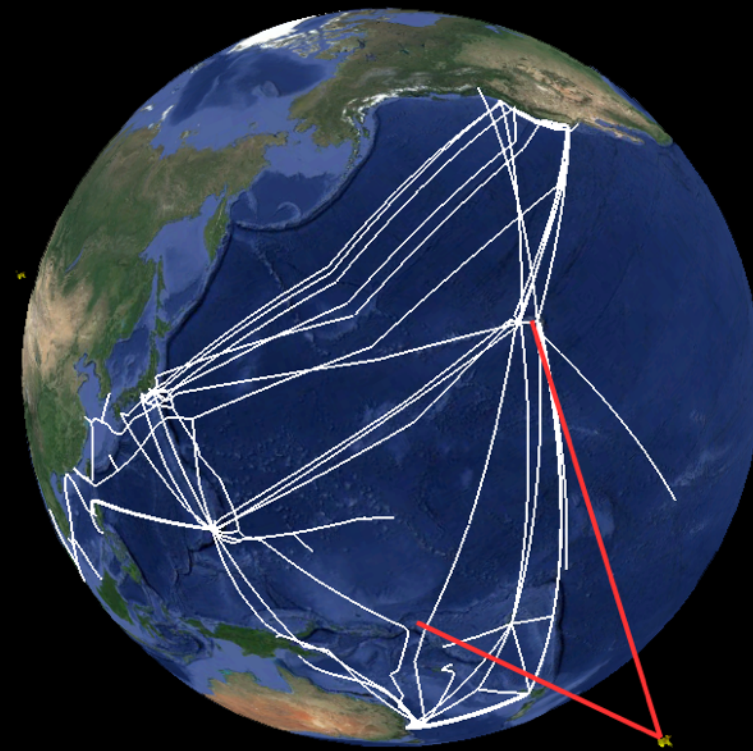
Sometimes Satellite is Faster than Fibre

Satellite Math

- O3b is 8,060 km Up
- $c = 300,000$ km /sec
- Honiara/Hawaii RTT: 107ms

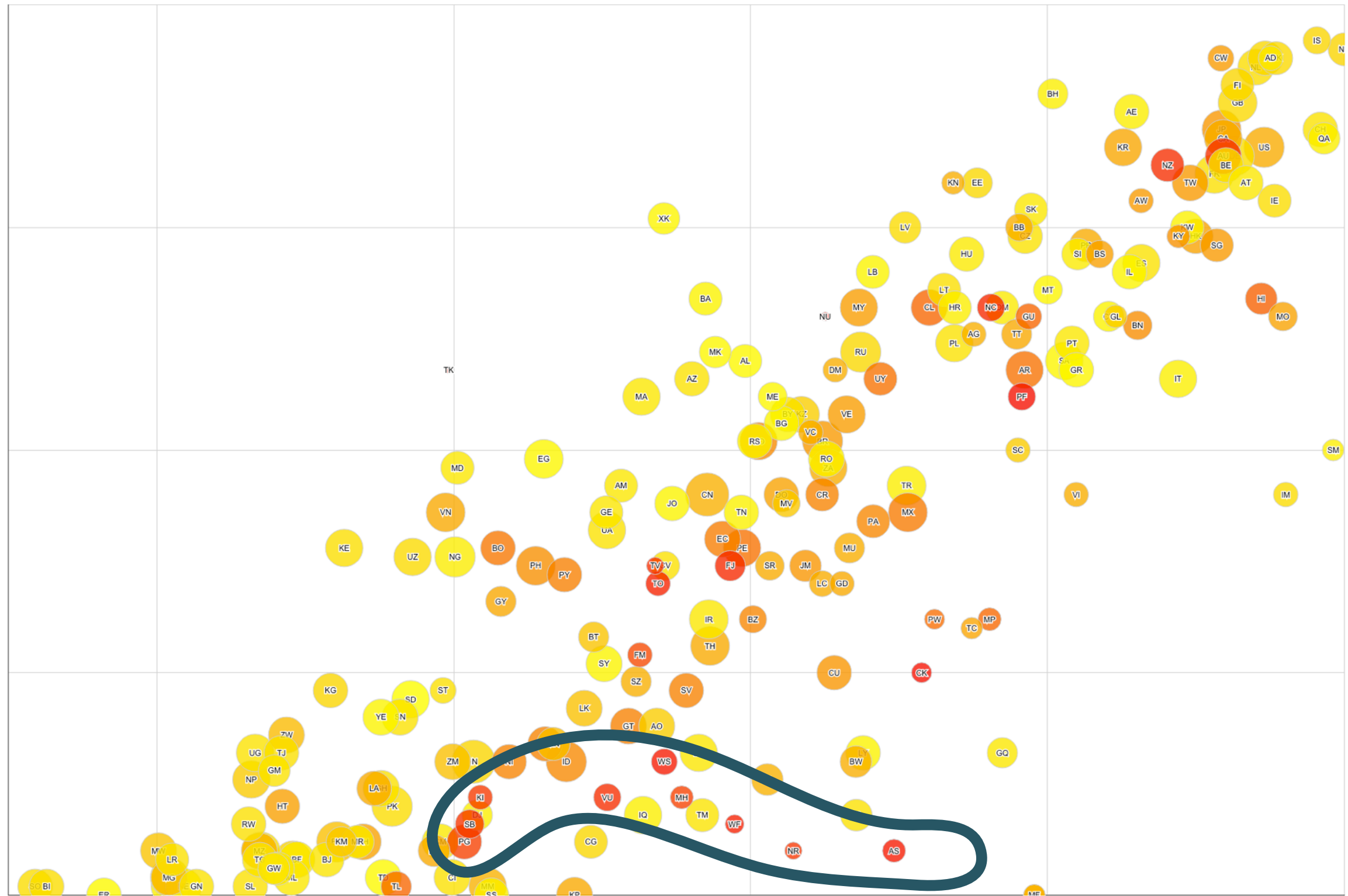
Fibre Math

- Honiara/Hawaii: 11,150km
- $c = 200,000$ km /sec
- Honiara/Hawaii RTT: 111.5ms



There's Heaps of Fibre
Satellite is now Awesome
(and getting even better)
What's the Problem?

Internet Uptake



GDP Per Capita

Carrier Investigation

inetnum_processed csv - x

127.0.0.1:3333/project?project=2292914728314

Google refine inetnum_processed csv Permalink

Open... Export Help

Facet / Filter Undo / Redo 233

Refresh Reset All Remove All

72 matching rows (903431 total)

Extensions: Freebase

Show as: rows records Show: 5 10 25 50 rows Sort

« first < previous 1 - 50 next > last »

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
☆	55987.	144.120.0.0	144.120.255.255	65536	usp	allocated portable	apnic fj
☆	620390.	27.123.128.0	27.123.191.255	16384	vodafonefiji	allocated portable	apnic fj
☆	98382.	210.7.0.0	210.7.31.255	8192	connectinternetservices	allocated portable	apnic fj
☆	328880.	119.235.64.0	119.235.95.255	8192	connectinternetservices	allocated portable	apnic fj
☆	389428.	113.20.64.0	113.20.95.255	8192	kidanet	allocated portable	apnic fj
☆	5919.	202.170.32.0	202.170.47.255	4096	fintel	allocated portable	apnic fj
☆	143370.	202.151.16.0	202.151.31.255	4096	unwired	allocated portable	apnic fj
☆	502631.	183.81.128.0	183.81.143.255	4096	vodafonefiji	allocated portable	apnic fj
☆	55173.	202.62.118.0	202.62.127.255	2560	connectinternetservices	allocated portable	apnic fj
☆	131203.	202.137.176.0	202.137.183.255	2048	tfttransitisp	allocated portable	apnic fj
☆	198977.	124.108.24.0	124.108.31.255	2048	govnet	allocated portable	apnic fj
☆	328882.	119.235.96.0	119.235.103.255	2048	connectinternetservices	allocated portable	apnic fj
☆	677405.	110.35.88.0	110.35.95.255	2048	kidanet	allocated portable	apnic fj
☆	193.	202.62.1.0	202.62.7.255	1792	sopac-fj	allocated portable	apnic fj
☆	380052.	202.129.228.0	202.129.231.255	1024	digicelpacific	allocated portable	apnic fj
☆	687765.	103.1.180.0	103.1.183.255	1024	digicelpacific	allocated portable	apnic fj
☆	777985.	103.244.228.0	103.244.231.255	1024	vodafonefiji	allocated portable	apnic fj
☆	870239.	43.245.56.0	43.245.59.255	1024	vodafonefiji	allocated portable	apnic fj
☆	1200.	202.62.0.0	202.62.0.255	256	sopac-fj	allocated portable	apnic fj
☆	246905.	203.83.251.0	203.83.251.255	256	vodafonefiji	assigned portable	apnic fj
☆	369268.	203.202.235.0	203.202.235.255	256	bspfiji	assigned portable	apnic fj
☆	617998.	183.81.130.0	183.81.130.255	256	vodafonefiji	allocated non-portable	apnic fj
☆	617999.	183.81.131.0	183.81.131.255	256	vodafonefiji	allocated non-portable	apnic fj
☆	618000.	183.81.132.0	183.81.132.255	256	vodafonefiji	allocated non-portable	apnic fj
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☆	747976.	27.123.176.0	27.123.176.255	256	vodafonefiji	allocated non-portable	apnic fj

javascript:({})

Price Investigation

SmokePing La x SmokePing La x SmokePing La x SmokePing La x SmokePing La x SmokePing La x SmokePing La x Rates & Plans x Telco2

www.bluesky.as/blueskyweb/?page_id=100

bluesky american samoa

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BLUESKY'S HSPA+ Experience HSPA+ experience

BLUESKY WIRELESS Communicate on our GSM network...

BLUESKY NET Get broadband to the home or office through us.

BLUESKY MOANA TV Always entertaining you.

Chat with an Agent

Local Chat Hours: Mon - Fri 8:30 AM - 5:00 PM

Rates & Plans

Home > Personal > Broadband > Rates & Plans

Residential Broadband

Plan	Monthly	2 Year Contract	3 Year Contract
Bluelink Wireless Internet (256kbps)	\$90.00	\$75.00	\$60.00
Bluelink Wireless Internet (384kbps)	\$115.00	\$90.00	\$75.00

Installation is a one time fee of \$150.00

MoanaTV Cable High Speed Broadband Internet

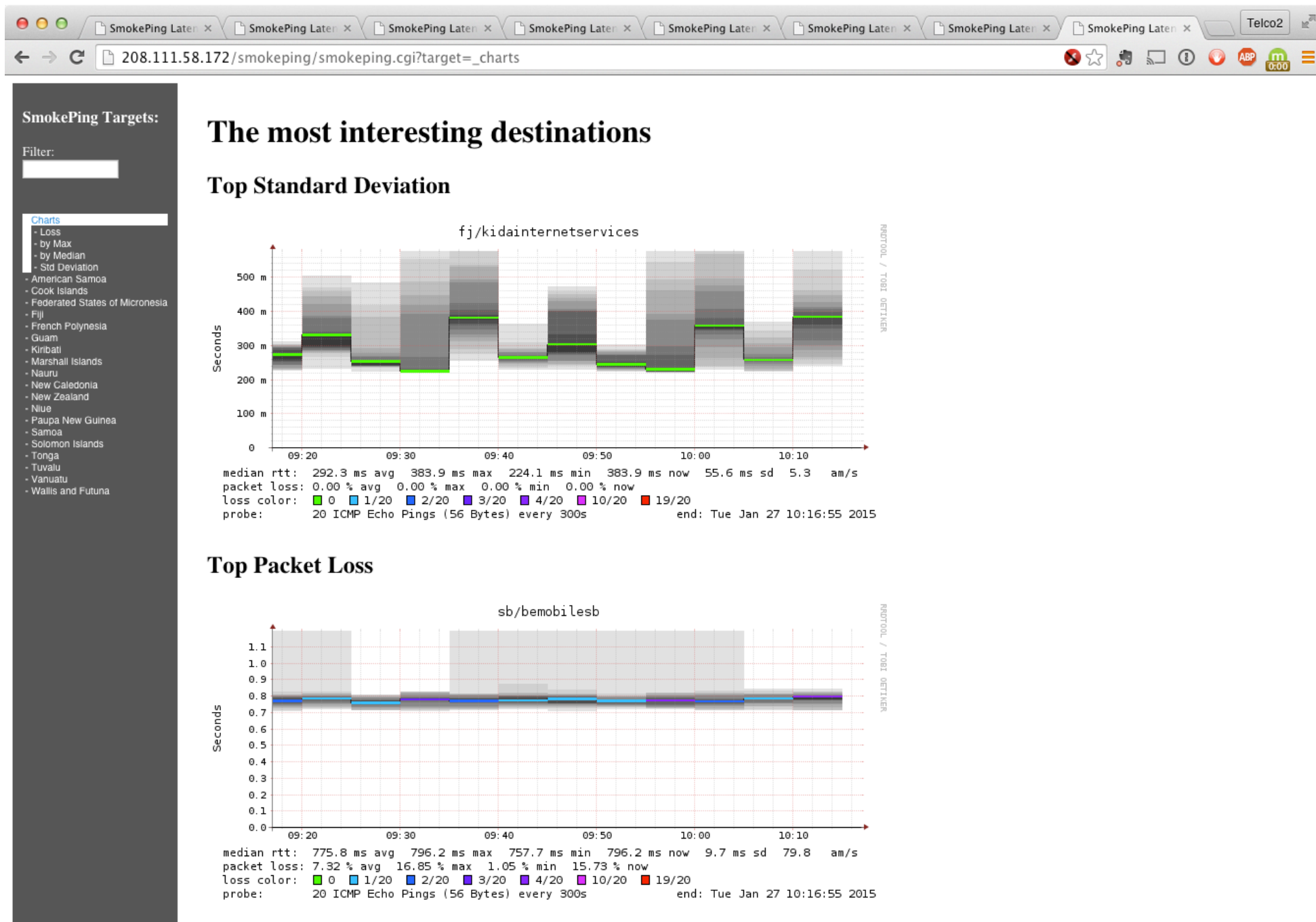
Plan	Basic Cable	Internet	Monthly Total
Broadband Gold (768kbps)	\$45.99	\$70.00	\$115.99
Broadband Platinum (1 Meg.)	\$45.99	\$105.00	\$150.99

Installation is a one time fee of \$150.00

iPhone 4S

www.bluesky.as/blueskyweb/?page_id=100

Performance Investigation





American Samoa

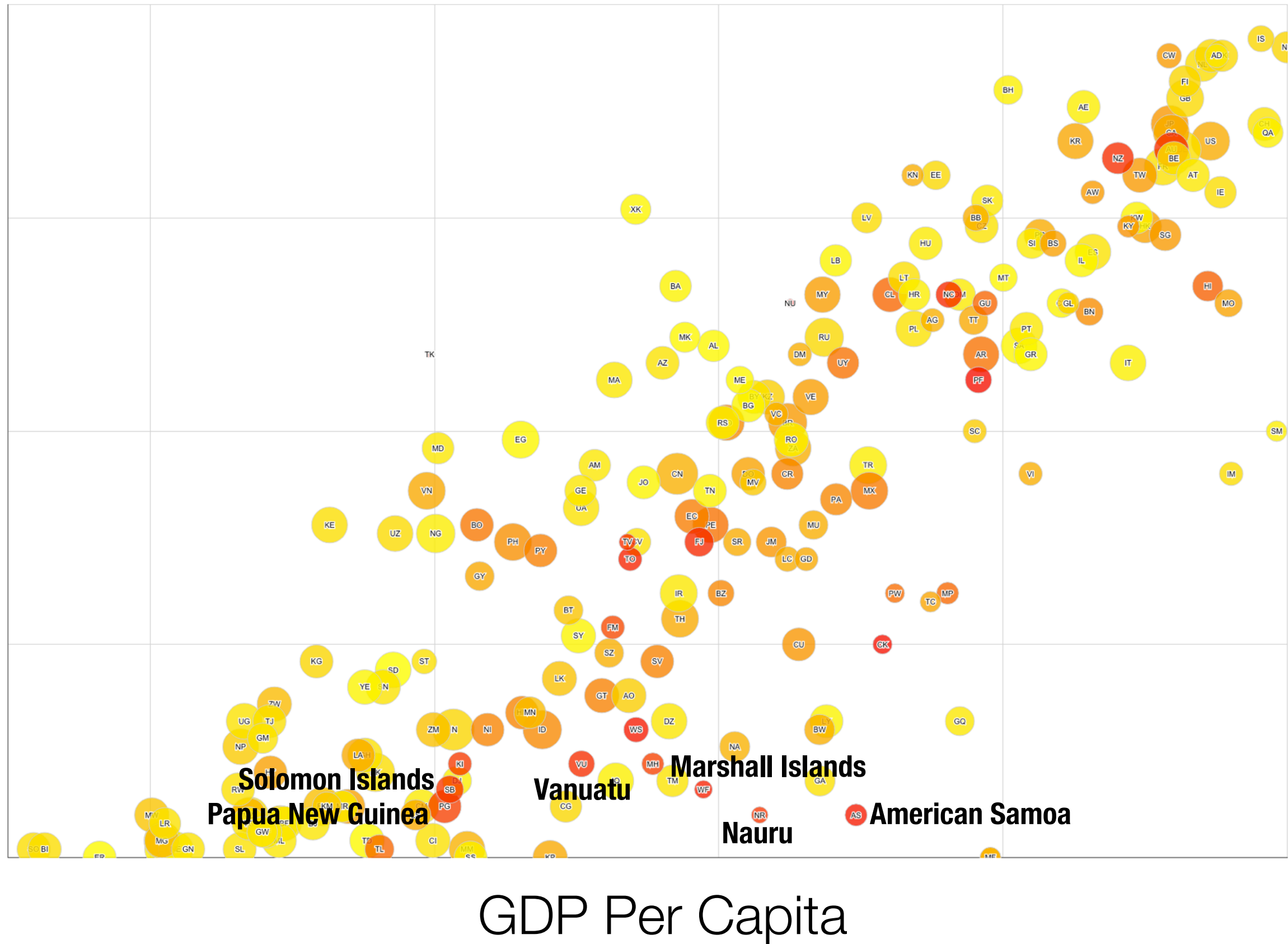
BlueSky American Samoa

- HFC, Wireless, Cellular Operator
- Same Parent as ASH Cable
- Competes against ASH Customers
- ASH FY13 = US \$5.8m (800mbps at \$600/mbps)
- 768kbps Cable Subscribers Pay US \$70/month

BlueSky Performance

Location	Distance	Best RTT	Actual RTT	Ratio
Tokyo	7,617	76.17	240	3.15
Singapore	9,552	95.52	300	3.14
Sydney	4,397	43.97	270	6.14
Ireland	15,435	154.35	280	1.81
Sao Paulo	12,613	126.13	290	2.30
North Virginia	11,330	113.3	190	1.68
Oregon	8212	82.12	140	1.70
Hawaii	4144	41.44	60	1.45
Overall Performance Indicator:				2.67

Internet Uptake



Pacific Interconnectivity

- Focus on Transit to the nearest big market(s)
- No regard for other Pacific Island countries
 - Vanuatu -> Suva traffic routes via Australia
- Typically no peering or interconnection on islands
- In PNG two carriers take two different fibres out
- Vanuatu Exchange works - due to government help

Interconnectivity Issues

- NZ to Hawaii \$/mbps == NZ to California \$/mbps
- Vanuatu-Suva cheap, but no good transit ex Suva
- Domestic transit in Fiji, Hawaii is very expensive
- Peering is difficult in Hawaii, impossible in Fiji
- Stopping along the way for big carriers is expensive
- Pacific Interconnectivity today = Market Failure

Real Issues for The Pacific

- Communications between islands suffer
- Communications on-island suffer (WS,FJ,SB,etc..)
- Education Networks performance suffers
- Sub-optimal routing benefits few.
- Market failure compounded by regulatory failure
- High costs could be affecting Internet uptake

Next Steps: ISIF Project

- Document Pacific Economic, Social, & Educational Ties
- Monitor Interconnectivity to/from ~ 60 Pacific networks
- Determine Regional Routing Inefficiencies
- Analyse Benefits of Regional Peering Points
 - Does every country need an exchange? Maybe not.
- Develop a Strategy for Improving Interconnectivity

Project Goals

- Topology of the Internet in the Pacific
- Matrix of inter-island stakeholders & their issues
- Information on the market to benefit users & providers
- Suggestions on where Peering might help networking

How Can You Help?

- Interviews: Tell me your stories, please!
 - Where have things gone right?
 - Where have things gone wrong?
- RIPE Atlas Probes: Host one, please!
 - They use around ~10kbps of traffic
 - Only need to allow ping, traceroute, http(s)

Thank You!

Email: jon@nsrc.org
Skype/Twitter: [@kiwibrew](#)