Pacific Submarine Cables

“The economic highway of the future will be made with glass not bitumen”

John Hibbard – Hibbard Consulting
Paul McCann – McCann Consulting International
Objective of the Presentation
Cables installed in the last decade
Which countries or territories are missing cables?

Tuvalu  Norfolk Is

Pitcairn Is  Easter Is

There are not many left!
Domestic Submarine Cables

FOCUS TURNING TO DOMESTIC CABLES BETWEEN ISLANDS IN A COUNTRY

- Palau festoon (Palau)
- Saipan-Tinian- Rota (CNMI)
- Chuuk-Pohnpei (FSM)
- Pohnpei – Kosrae (FSM)
- PNG Domestic festoon (PNG)
- Honiara- Auki- Noro (Solomons)
- PICOT: Grand Terre-Ouvea-Lifou (New Caledonia)
- Suva-Savusavu (Fiji)
- Tongatapu-Vava’u (Tonga)
- Wallis-Futuna (W&F)
- Atafu-Nukunonu-Fakaofu (Tokelau)
- Apia-Savaii (Samoa)
- Rarotonga-Aitutaki (Cook Is)
- Tahiti –Bora Bora (French Pol)
- Tahiti – Tuamotu – Marquesas (FP)
Second Cables for Diversity

SOME PACIFIC ISLANDS IMPLEMENTING SECOND CABLES FOR DIVERSITY

- Saipan, Tinian, Rota
- Samoa
- Tahiti
- American Samoa
- Fiji
- PNG
- New Caledonia
Features of Pacific Island Cables

- Megabits and Gigabits, not Terabits
- Very significant lengths
- Critical links – often single umbilical cord key to country’s economy
- Prices down from $1000’s per Mbps to $100’s but not $10’s
- Very few capacity buyers
- Opex can be difficult to cover with revenue
- Capex funding a challenge; MDB’s often needed
- Skills hard to find and retain
- Skills shortage or opex minimisation encourages outsourcing
# Pacific Cable Experience

<table>
<thead>
<tr>
<th>Cable</th>
<th>Routing</th>
<th>Demand prior to commissioning</th>
<th>Capacity one month after date of commissioning</th>
<th>Capacity Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>APNG2</td>
<td>PNG – Aust</td>
<td>22Mbps</td>
<td>45 Mbps (Nov 2006)</td>
<td>1100 Mbps</td>
</tr>
<tr>
<td>Gondwana</td>
<td>New Cal – Aust</td>
<td>150 Mbps</td>
<td>450 Mbps (Oct 2008)</td>
<td>10,000 Mbps</td>
</tr>
<tr>
<td>ASH</td>
<td>Pago-Hawaii</td>
<td>35 Mbps</td>
<td>90 Mbps (May 2009)</td>
<td>850 Mbps</td>
</tr>
<tr>
<td>SAS-ASH</td>
<td>Apia-Hawaii</td>
<td>15 Mbps</td>
<td>45 Mbps (May 2009)</td>
<td>250 Mbps</td>
</tr>
<tr>
<td>PPC -1 spur to PNG</td>
<td>Madang – Guam &amp; Sydney</td>
<td>N/A</td>
<td>20 Mbps (Oct 2009)</td>
<td>4000 Mbps</td>
</tr>
<tr>
<td>Honotua</td>
<td>Tahiti -Hawaii</td>
<td>600 Mbps</td>
<td>1500 Mbps (Sept 2010)</td>
<td>14,000 Mbps</td>
</tr>
<tr>
<td>Tonga Cable</td>
<td>Tonga-Fiji</td>
<td>80 Mbps</td>
<td>310 Mbps (Aug 2013)</td>
<td>900 Mbps</td>
</tr>
<tr>
<td>Interchange Cable</td>
<td>Vila-Fiji</td>
<td>150 Mbps</td>
<td>450 Mbps (Jan 2014)</td>
<td>1250 Mbps</td>
</tr>
</tbody>
</table>
Pacific Cable Experience
Structural Alternatives

- **Consortium Cables:** Capacity and funding linked; all funds from owners equity; no project debt; need to cover costs but no profit, requires multiple owner-buyers.
  - East Micronesia Cable (proposed)
  - Manatua Cable (proposed)

- **“Private” Cables:** Capacity and ownership not linked, funding from equity and project debt; the cable needs to give equity parties an ROI; NPF can participate.
  - Tonga Cable
  - Interchange Cable
  - Palau Cable
  - Yap Cable
  - Tui-Samoa Cable

*Few consortium cables due to few users*
System Design

Many network & technical elements to consider:

- Point to point route
- Connect to a hub (e.g. Fiji, Guam) to contain cable length
- Connection of Opportunity - Spur off a more major cable
- BU for domestic connections or other territories – planning!
- One fibre pair or two?
- High capacity or modest capacity - repeater spacing?
- Types of landings; safe places to land
- Cable stations – new, existing telecom site; construct or buy building, land ownership
- Connectivity for customers – how accessible will the cable be?

*Complexity often overlooked by Governments & Regulators*
Building the Business Case

The Development Phase – justifying the investment!

- Choosing the route
- Projecting demand
- Determining the costs
- Sourcing the funding
- Modelling the prices for the requisite revenue
- Regulatory requirements
- Government factors
What are the Costs?

**Cable Station costs**
Floorspace rental, power, fuel, maintenance costs, consumed spares

**Marine Costs**
Marine maintenance, funding reserve for repairs, cable depot

**Operations Costs**
NOC costs, staffing, site security, costs of outsourcing

**Administration & Finance**
Management costs, Office costs, Debt servicing, Insurance, Billing and Accounts, Leases and Permit renewals, licence fees
Funding

Sources
- Owners’ equity
- NPFs
- Commercial banks
- MDBs and aid agencies (WB, ADB, PRIF, AFD, etc)
- Capacity users’ deposits

Points to remember
- MDB’s only fund upfront costs not ongoing costs
- Can be substantial costs for due diligence
- MDB’s typically only fund up to 80%; owners find the rest
- MDBs only lend monies to government
Project Documents

- Cable Structure – e.g. C&MA, MOU or Shareholders’ Agreement
- Main Supply Contract
- Landing Party Agreement (LPA)
- Civil works contract
- Loan Agreement
- Capacity Use Agreement (CUA)
- RIO (Reference Interconnect Offer)
- EIA (Environmental Impact Assessment)
- Permits and Licences
- Marine Maintenance Agreement
- NOC and operational support agreements
- Onward connectivity
Comments for Regulators

- Cables sell wholesale and capacity buyers sell retail
- Pricing difficult to set due to need for revenue to cover opex and debt servicing, and acceptable profit
- Annual Operating costs are constant over time (maybe rising at CPI) so unit prices can only fall as fast demand grows.
- MDBs accept that 10% rate of return is OK
- Open access to CLS important so RIO (aka RAO) essential
- Single cable will be a dominant facility but satellites do offer some competitive pressure
- Restoration generally responsibility of capacity buyer not the cable owners
- Backhaul is generally a responsibility of customers, not cable owners who only have to provide space and power (at a reasonable cost) to enable the customers to establish their links to the CLS
- Sharing domestic cables between competing carriers presents challenges to ensuring use
Comments for Governments

- Recognise that cables will facilitate e-commerce which will potentially be the largest enabler of a country's future wealth.
- Promote development of applications to exploit the abundant capacity (e.g., e-health, e-gov, e-learning, teleworking) and enhance the wellbeing of the population.
- Promote feeder networks so that CLS does not get bottlenecked.
- Work with funding agencies to ensure an appropriate proportion of such funds is applied to communications in the country.
- Determine whether you wish to have private investors or direct government ownership.
- If capacity price is set too low and revenue does not cover costs, government may need to inject funds to maintain the vital infrastructure.
- Governments need to think carefully about taxing at the wholesale level (as it effectively creates dole taxation).
REMEMBER

“The economic highway of the future will be made with glass not bitumen”

Thank You

ENSURE YOUR COUNTRY’S FUTURE