

## Data Roaming – Australians visiting New Zealand

The retail price of mobile data roaming into New Zealand ranges up to \$51/MB (for Vodafone prepaid casual users). Yet, the cost of providing service is less than \$1/MB with most of that going to the New Zealand mobile operator.

This note explains the service arrangements, costs and billing of mobile data roaming services from Australia into New Zealand. It also suggests how firm action can be taken now to eliminate the difference in domestic and overseas mobile data roaming costs – initially just across the Tasman.

### What is data roaming?

Data roaming is a service provided to mobile users who go overseas and are then charged for traffic measured in bytes sent/received while they are overseas<sup>1</sup>. Data roaming can be done over a smartphone or tablet and can take a number of forms such as email, web browsing, use of social networks and video downloads/streaming.

According to a Galaxy study commissioned by Vodafone, 52% of consumers used their smartphones to send/receive emails and 75% used mobile apps with the most popular being: Email apps (58%), Facebook (55%), Google maps (38%), Skype (26%) and TripAdvisor (25%)<sup>2</sup>.

The mobile operators provide usage calculators that require the customer to make many assumptions about their habits and provide conflicting advice:

**Table 1: Downloads for different applications**

Activity	Telstra	Vodafone
Email	25KB	50KB
Email with attachment	1MB	4MB
Webpage	0.2MB	1MB
Music download	4MB	6MB

Sources: <http://www.telstra.com.au/mobile-phones/international-roaming/estimate-data-usage-overseas/index.htm> (accessed late 2013) and <http://www.vodafone.com.au/personal/wireless-internet/mobile-broadband/data-calculator> (accessed July 2014)

According to Galaxy, over 90% of Australian overseas trippers employ strategies to manage costs (e.g. turning off roaming) and experienced negative feelings and disconnection from having to do so.

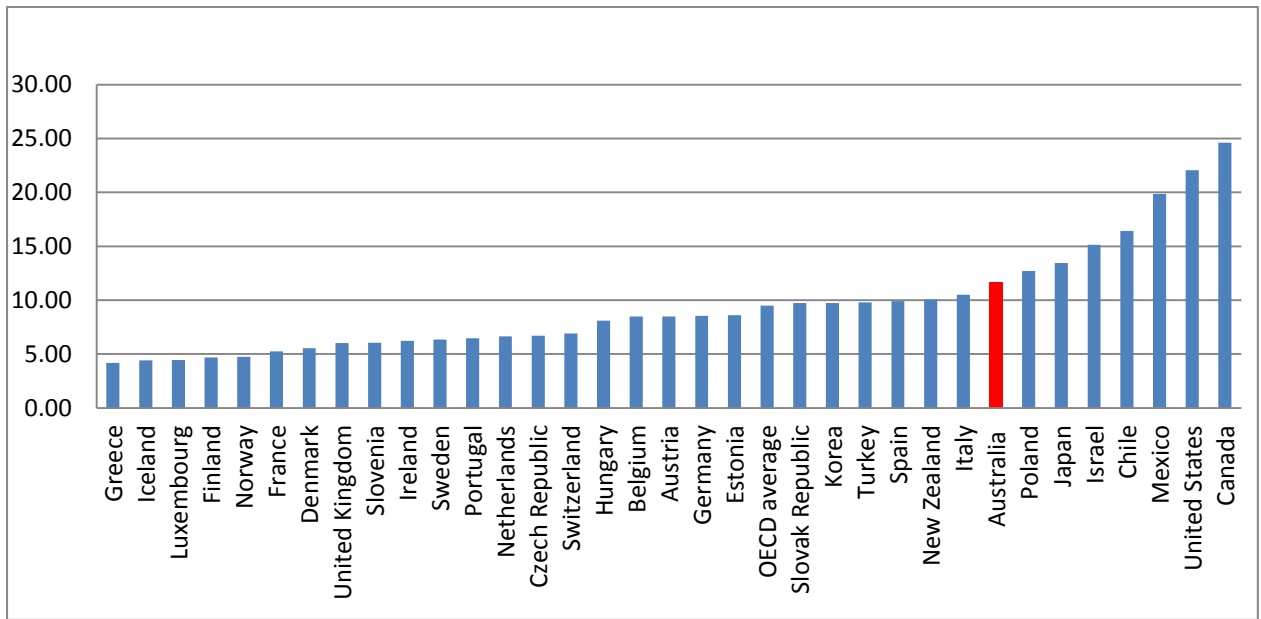
### How much does it cost?

By international standards, the Australians pay relatively more for data-roaming than consumers in other countries; as shown in Figure 1 below.

<sup>1</sup> A kilobyte (KB) is 1024 bytes, a megabyte (MB) is 1024 kilobytes and 1024 MB is a gigabyte (GB). A byte is a sequence of 8 bits (enough to represent one alphanumeric character) processed as a single unit of information. Each bit is either '1' or '0'. For example, to store the letter 'R' uses 1 byte, which is stored by the computer as 8 bits, '01010010'. A document containing 100 characters would use 100 bytes (800 bits). If the cost is 1 cent/KB, this is equivalent to \$10/MB and \$10,000/GB.

<sup>2</sup> Reported in *CommsWire*, 5 December 2013

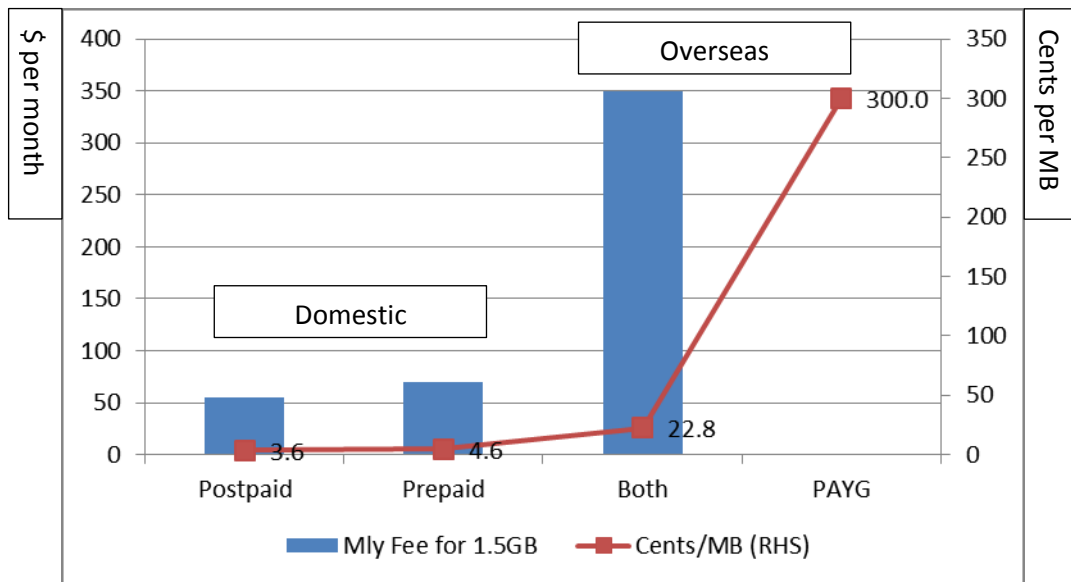
**Figure 1: Average price for 1 MB in one session (US\$) - by country of origin of the traveller in 2010**



Source: OECD: Figure 2 in International Mobile Data Roaming, 30 May 2011

The data in the chart above is quite old and Australian carriers all reduced overseas roaming costs in late 2013. The following chart shows Telstra’s domestic and roaming costs at June 2014.

**Figure 2: Telstra’s mobile data fees for 1.5 GB at June 2014**



According to Goldman Sachs, Telstra’s mobile roaming revenues were around \$550m in 2012-13, or 7 percent of its mobile services revenues.

The cents per MB in Figure 2 above assume that exactly 1.5 GB is used – except for the Pay-As-You-Go (PAYG) rate shown at the far right. So, if only half the cap is used, the cents per MB will be double that shown in the red line. Note that the cost per MB for the Casual Traveller Data Pack (shown as

“Both” above as it can be purchased by both postpaid and prepaid customers) is about 5 times higher than the domestic rate.

If you think Telstra’s \$3/MB is high for PAYG, consider Vodafone; which claims to be taking the lead in driving down the cost of roaming. Vodafone’s PAYG rate for prepaid customers is a \$51.20/MB<sup>3</sup> (and \$1/MB for postpaid PAYG). Vodafone’s postpaid customers pay \$45 pm for 1.5 GB (2.9 cents/MB; if the cap is completely used) and can draw on this domestic cap overseas for \$5/day. That works out at 9.8 cents/MB for a typical day of use – three times more than using the cap at home.

The domestic rate for mobile data for Optus postpaid customers is 1.3 or 3.9 cents/MB (different plans and assuming the whole cap is used). Overseas, they pay 14.3 cents/MB on the \$10 per day Travel Pack (if they do not use unlimited talk and text) and 50 cents/MB for excess or PAYG (latter charged in 10 KB blocks).

Current domestic and overseas rates for Telstra, Optus and Vodafone are shown at Attachment 1.

Customers have always been aware that they would pay a premium for voice roaming. With voice service priced per minute, they are aware of the minutes used and can control their budgets. With data roaming priced per kilobyte (KB), customers have poor understanding of what kilobytes are and still less understanding of how much data different services will consume. Domestically, data use is usually included in a generous monthly data cap so that there is effectively a flat charge per month with no need to understand the amount of data consumed or the price. Overseas, even if the customer is aware of the price per kilobyte of data consumed, it is difficult to keep track of the volume of data used.

Data roaming is becoming an important issue with increasing adoption of smartphones<sup>4</sup> and tablets (e.g. iPads). So, it is not surprising that telco executives are sensitive about it (see Box 1).

**Box 1: Mea culpa?**

“The number one issue around bill shock is .. using devices while overseas” (Bill Morrow, Vodafone CEO announcing Roam like Home plans in August 2013)

“Data roaming packs can be expensive and confusing” (Kim Clarke, Vodafone CMO December 2013)

“We know that nothing upsets customers more than complicated rates or being hit with a large unexpected bill” (Vicky Brady, Optus)

“The idea that you are on holiday and get a \$5,000 bill is a shocker .. The idea that your kids can do something and you end up with a \$500 bill is crap. I think it is a bit immoral” (Kevin Russell, Optus CEO November 2013)

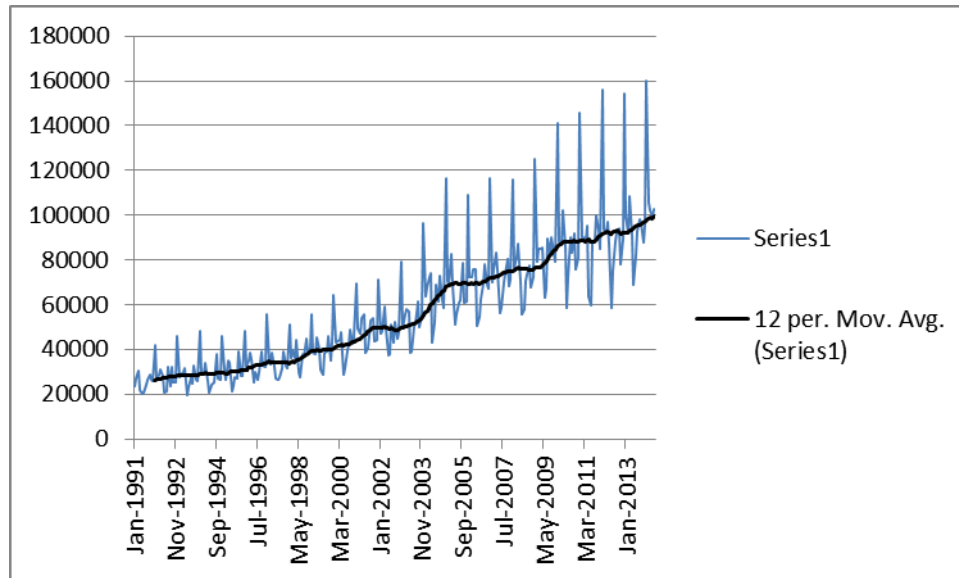
<sup>3</sup> Tick the Prepaid circle at <http://www.vodafone.com.au/personal/international-roaming?cid=redirect:vca:url:roaming>

<sup>4</sup> A smartphone is built on a mobile operating system (OS) with more advanced computing capability and connectivity than a traditional mobile phone. Popular operating systems include Google’s Android and Apple’s iOS. Mobile operating systems can be installed on many different phone models, and typically each device can receive multiple OS software updates over its lifetime – which leads to passive data roaming.

## Where do Aussies go?

New Zealand is the most important destination for short-term departures from Australia and departures to New Zealand are growing steadily.

**Figure 3: Short term departures to New Zealand**



Source: ABS Cat. No. 3401.0

In the year to April 2014, there were 8.9m short departures from Australia with the following three countries accounting for 30%:

- NZ 1.2m (13.3%)
- UK 0.5m (6.2%)
- USA 0.9m (10.6%)

For Vodafone, 40% of its customers travel mostly to the US, UK and NZ accounting for 50% of overseas data consumption (Bill Morrow, August 2013).

## How is data roaming provided?

To provide a data roaming service, a mobile operator has to develop commercial relationships with one or more corresponding operators in the roamed country.

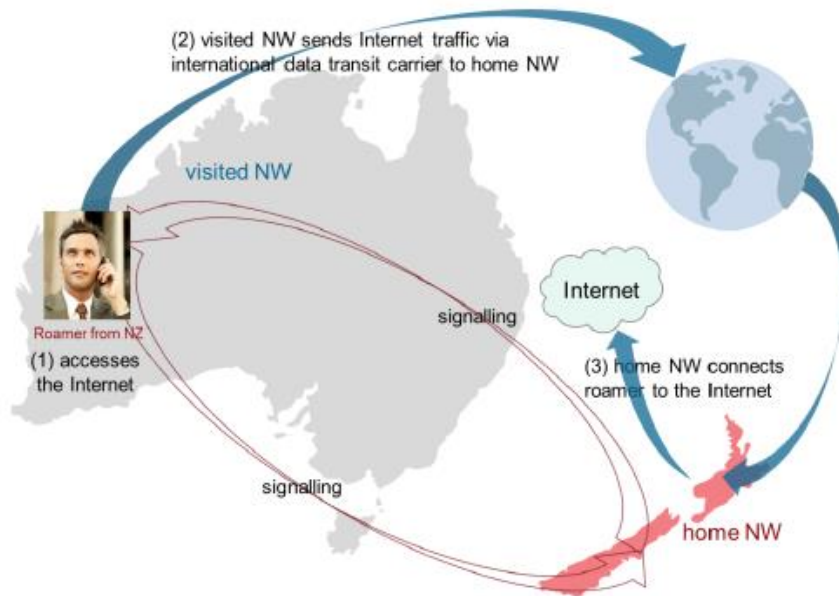
The domestic mobile provider is referred to as the Home Network of the user and the mobile network used to help provide the service overseas is known as the Visited Network. The Home Network invoices the user for the amount of data sent and received while overseas. Internet access is provided by the Home Network as illustrated below in Figure 4; where Australia is the Visited Network in this example.

There are a number of things that need to happen to make the data roaming service possible.

First, as mobile phone handsets are manufactured to work on particular frequencies, an individual roaming in overseas jurisdictions will only be able to utilise international roaming services in those countries where mobile telephony services are provided on the same frequency as that for which

the individual's mobile handset is configured. For example, Optus uses 900/1800MHz for 2G, 900/2100MHz for 3G and 1800/2300MHz for 4G.

**Figure 4: Illustration of data roamer in Australia**



Source: Figure 6, WIK-Consult, May 2012

Telstra has data roaming agreements with all three mobile operators in New Zealand; but none can support the 4G services now available in some metropolitan areas of Australia.

**Table 2: Data roaming compatibility – Telstra customers in New Zealand**

Carrier	Network	Frequency
Telecom New Zealand	2G	Not available
	3G	850/2100
	4G	Not available
2degrees	2G	900/1800
	3G	Not available
	4G	Not available
Vodafone	2G	900/1800
	3G	2100
	4G	Not available

Source: <http://www.telstra.com.au/mobile-phones/international-roaming/pricing-compatibility/> (accessed late 2013)

Second, the development of a roaming agreement to support mobility management, authentication, authorization and billing procedures is preceded by a series of testing processes defined by the IREG (International Roaming Expert Group) and TADIG (Transferred Account Data Interchange Group). While the IREG testing is to test the proper functioning of communication links, the TADIG testing is to check the billability of the calls.

Third, changes have to be made to existing networks to allow validation, connection and billing for data roaming:

### **Validation**

When the mobile device is turned on, the Visited Network reads the International Mobile Subscriber Identity (IMSI number) on the SIM card in the device. The IMSI is a unique 15 digit long number which will tell any network from which country and network you are from.

Once the Visited Network notices that the IMSI is not registered with its Home Location Register (HLR), it attempts to identify its Home Network. If there is no roaming agreement with the identified network, maintenance of service is impossible and service is denied by the Visited Network. But, if there is a roaming agreement, the Visited Network contacts the Home Network and requests service information (including whether or not the mobile should be allowed to roam). Details from the customer's HLR on its Home Network are then copied to the Visitor Location Register on the Visited Network. The Visited Network then begins to maintain a temporary subscriber record for the device. Likewise, the Home Network updates its information to indicate that the device is on the Visited Network so that any information sent to that device can be correctly routed.

There is also a 15 digit IMEI number on tablets; which is important to passive roaming. Like the IMSI, the IMEI is a unique international number. But it is not part of the SIM card (which can be transferred between devices). The IMEI number is device specific and provides certain information like your device TAC code that in turn identifies your device make, model, and features that you have. Certain networks use the IMEI to send device specific settings to your device, to enable your device to connect to the internet, send sms (texts), mms etc.

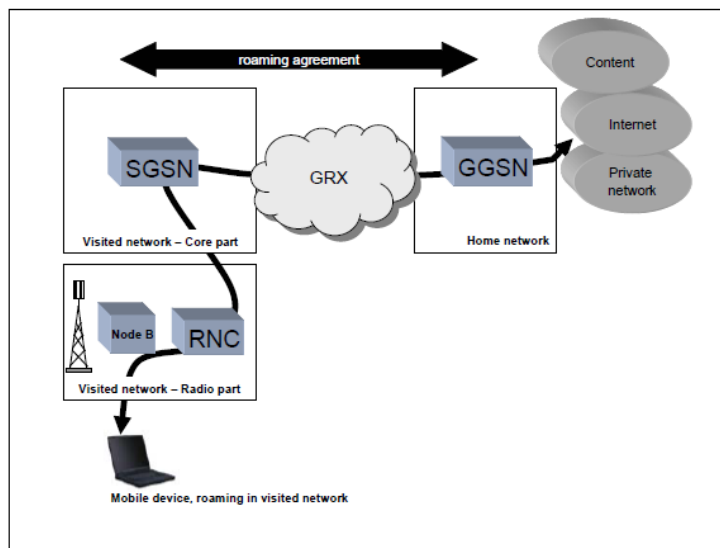
So the IMSI is needed for roaming and the IMEI is used by the Home Network to send updates (which generates passive data roaming).

### **Connection**

The antenna built into the mobile device communicates with the Visited Network's nearest tower (Base Station Receiver, BTS) which then links to the Remote Network Controller (RNC, also called Base Station Controller) which manages a group of towers. The Visited Network may need to augment such radio network capacity to accommodate data roaming. If the traffic profile is similar to domestic data traffic, it would actually reduce unit costs of carrying data for the Visited Network. It is only if there were seasonal differences at specific locations causing over-capacity outside the tourist season that roaming data traffic would increase costs per MB carried.

In Figure 5 below, the Serving GPRS Support Node (SGSN) on the Visited Network manages the mobility of the mobile device; keeping track of its location and managing the data connection toward the radio network.

**Figure 5: Traffic management for data roaming**



Source: Figure 6 in Vrolijk & Bouwman Study 'Roaming data services'

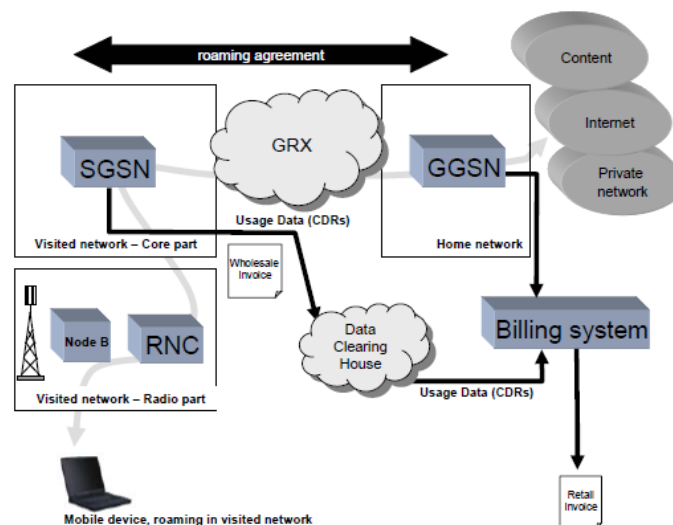
The Gateway GPRS Support Node (GGSN) on the Home Network manages the connectivity to the destination for the data session; such as the internet.

The SGSN and the GGSN could be interconnected by the GPRS Roaming Exchange (GRX), which is a peering exchange where several operators meet to exchange traffic, or by a direct connection between two networks. The latter is probably the case for Trans-Tasman data roaming.

### Billing

The two thick black lines in Figure 6 below show where usage records are generated and where they are sent. The records collected by the Visited Network's SGSN support wholesale fees under the IOT. The records generated on the Home Network's GGSN can independently support retail billing.

**Figure 6: Information flows for billing data roaming**



Source: Figure 14 in Vrolijk & Bouwman Study 'Roaming data services'

At the SGSN the usage by a subscriber in a Visited Network is captured in a file called the TAP (Transferred Accounting Procedure) / CIBER (Cellular Inter-carrier Billing Exchange Record) which is sent to the Home Network. Files are exchanged monthly.

The Home Network operator validates the data in the TAP files to ensure that it conforms to the TAP standard and to the terms of the roaming agreement. If the received TAP file contains any errors, the Home Network operator can reject the entire file or only the incorrect call event detail records. The incorrect file or records are returned to the Visited Network operator in a Returned Account Procedure (RAP) file.

It appears that Telstra was not as diligent as it should have been in validating the files it received. Box 2 below refers to the fact that some (unnamed) Visited Networks sometimes cut long data sessions<sup>5</sup> into segments. The data files should indicate when a data file relates to a part data session or a full data session. It is understood that some carriers left the indicator for a part data session blank and that was interpreted by Telstra as a full data session, resulting in the data session fee being applied multiple times for a single data session.

#### **Box 2: Inaccurate records and over-charging**

Telstra has begun issuing refunds of about \$30 million after admitting it had been over-charging customers for global roaming services on mobile phones since 2006.

The telco has been writing to customers for the past month informing them that their data charges while they were travelling overseas had been "incorrectly calculated" and they would be given refunds.

Despite the over-charging going back to 2006 and involving tens of millions of dollars, Telstra only became aware of the issue when it conducted an audit earlier this year. It is understood the issue only affected Telstra but a spokesman for the telco blamed international carriers.

*"Telstra became aware of an issue whereby some customers were charged multiple data session fees due to the way international carriers generate their data usage records," the Telstra spokesman said. "Once we identified the issue, we put immediate steps in place to prevent further multiple charging."*

SMH, 21<sup>st</sup> December 2012 <http://www.smh.com.au/technology/technology-news/telstra-repays-30-million-after-overcharging-for-global-roaming-20121221-2bqr1.html>

---

<sup>5</sup> The data session concept is a product of the Product Data Protocol (PDP). When a mobile device is switched on, it registers with the Visited Network and a session commences when the device is assigned an access point at the GGSN, connecting it to, say, the internet. Data is sent and received, but not in a constant flow. A session could last a long time and capture several instances of active data exchange. The session length may depend upon the device (a Blackberry supports a single session while it is switched on and within network reach) and/or the mobile network (a session may be terminated if there has been no active data exchange for a certain period of time).



Research into pricing by the Australian and New Zealand Governments found that both Telstra’s post-paid and pre-paid customers paid a 50 cent session fee<sup>6</sup>. It is unclear from its site whether Telstra still has a session fee.

At the GGSN, the Home Network generates its own usage records for retail billing. These records are immediately available and therefore allow an efficient means for offering data roaming services to pre-paid services (e.g. to see if sufficient credit is available) and enable real time charging. The GGSN also provides an efficient means for monitoring usage, prevention of fraud and misuse. The GGSN is not an incremental expense for data roaming; it already exists.

### What does it cost the networks to provide data roaming?

The large differences between domestic and overseas retail prices per MB of data do not appear to be justified by differences in cost. As shown in Table 3 below, it costs Australian mobile operators less than \$1/MB to provide data roaming in New Zealand with more than half the cost accounted for by the wholesale rate (Inter Operator Tariff, IOT) paid to the New Zealand mobile carrier.

**Table 3: Cost per MB of serving a data roamer**

	Australia A\$ cents	New Zealand NZ\$ cents
<b>Home Network</b>		
Inter-operator tariff paid	63.73	42.86
International transit	2.85	3.36
Signalling	0.14	0.11
Roaming overheads	2.78	3.28
Retail costs	<u>25.18</u>	<u>29.68</u>
	94.68	79.29
<b>Visited Network</b>		
Data traffic costs	18.90	20.79
International transit	2.85	3.36
Signalling	0.14	0.11
Roaming overheads	<u>2.78</u>	<u>3.28</u>
	24.67	27.54

Source: WIK-Consult, May 2012

The cost data in Table 3 above comes from the modelling commissioned by the Australian and New Zealand governments from WIK Consult<sup>7</sup>. Naturally, any cost modelling can be subject to debate<sup>8</sup>.

<sup>6</sup> Analysis of retail trans-Tasman mobile roaming prices: methodology, assumptions and price data, May 2010, Tables 21 and 22. It also reported no flag-fall for the other Australian carriers for trans- Tasman roaming.

<sup>7</sup> The WIK model was originally developed for the ACCC in 2007. It was based on 2.5G technology and is consequently a bit out-dated as 3G and 3.5G technology is now employed – Telstra had a 3G data roaming agreement with Vodafone in 2007.

<sup>8</sup> The Final Report issued by the Australian/New Zealand governments in 2013 responds to the criticisms levelled at the WIK model at pages 23-27.

But it is important to focus only on the incremental costs of providing data roaming given that the mobile network and supporting systems and processes exist primarily to support local customers and traffic.

The top half of Table 3 shows the costs per MB of an Australian (New Zealand) mobile network serving its data roaming customers in New Zealand (Australia). The cost to the Australian network is 94.68 cents/MB of which 63.73 cents is the IOT remitted to the Visited Network operator in New Zealand.

The bottom half of Table 3 shows the costs per MB of an Australian (New Zealand) mobile network as the Visited Network serving data roaming customers from New Zealand (Australia). Note that the inter-operator tariff (IOT) paid by the Australian network to the Visited Network in New Zealand is considerably higher than the corresponding cost to the Visited Network (the IOT and corresponding costs in the Visited Network are highlighted in yellow).

One can understand why regulators are keen to see IOTs reduced towards cost; the difference between the yellowed numbers in Table 3 is very large (even after exchange rate conversion). But regulators have no influence over operators in an overseas jurisdiction. Even if they could force the wholesale (IOT) rate down, there is no guarantee that the Home Network in Australia would pass on any reductions in IOT costs to their own customers<sup>9</sup>.

There is an exception. A maverick operator breaking ranks can alter the situation. 2degrees became a mobile operator in New Zealand in 2009. Initially, its rates per MB were higher than for Vodafone and Telecom New Zealand (XT). But when it slashed its rates, the others followed, as shown in Table 4 below. The minimum rates are for some post-paid customers and are above the NZ 42.86 cents paid to the Australian Visited Network (Table 3).

**Table 4: New Zealand data roaming rates into Australia**

		<b>2degrees</b>	<b>Vodafone</b>	<b>XT</b>
May 2010		\$30.00	\$10.00	\$10.00
Mar. 2012	Min	\$0.50	\$0.50	\$2.50
	Max	\$0.95		\$4.00

Source: Ross Patterson and operator sites

The New Zealand regulator at the time, Ross Patterson, attributes the move to the joint Australian/New Zealand inquiry into Trans-Tasman data roaming: *“It is interesting to note that since the publication of the issues paper in May 2010, headline retail prices for trans-Tasman roaming services began to drop significantly in New Zealand, particularly for data. This suggests that the mere fact of the investigation has led operators to reconsider their roaming charges”*<sup>10</sup>.

Another maverick speaking frankly is the UK’s smallest mobile operator; see Box 3.

<sup>9</sup> A similar situation arose with reductions in mobile voice termination rates.

<sup>10</sup> Presentation by Ross Patterson to the Asia-Pacific Regulators Forum, 31 March 2012 at <http://www.comcom.govt.nz/presentation-to-itu-trai-asia-pacific-regulators-round-table-31-march-2012/>

### Box 3: An inside view of costs

As the smallest UK mobile network operator, it is unsurprising that 3 is willing to break the industry *Omertà* surrounding the actual costs involved. The company's regulatory chief, Hugh Davies, tells ZDNet UK that operators do need to incur some one-off costs when enabling data roaming, but these do not explain the charges being levied on consumers. In fact, he says, data-roaming retail prices bear no relation to the underlying costs of data transport — between 1p and 3p per megabyte, depending on the operator.

"It costs you [the operator] about the same as it costs you at home — plus a little bit extra for the cost of billing from someone else's systems and the integration and connection with someone else's systems, and the risk of countries where you don't have fully integrated systems — but essentially it's the same as what it costs you to sell it in your own market, plus a little bit more," Davies says. "And that little bit more is not the same as what consumers are paying. It's way too high. It's the equivalent of walking into a bar in Germany and being told 'here's a glass of wine for €500 (£439) because you're a Brit or a Spaniard'."

Apart from things like [visitor location registers], there are no dedicated 'roaming network assets.

<http://www.zdnet.com/why-data-roaming-costs-too-much-3040092266/> 29<sup>th</sup> March 2011

### How can we cut the cost of roaming?

The Australian and New Zealand governments are concerned about the cost of roaming and commissioned research leading to actions to increase customer awareness (Box 4).

### Box 4: Customer warnings

In August, 2012 following the joint report with NZ, Conroy directed the ACMA *“to put in place an industry standard for mobile roaming so that consumers know exactly how much they will be charged when they make a phone call, send a text message, or surf the internet, wherever they may be overseas”*. In 2013 the ACMA announced a new IMR standard which was implemented in September 2013. Its four key consumer protection measures are:

- A notification via SMS to be sent to all consumers on arrival overseas, warning them that significantly higher charges for using roaming services may apply.
- Enabling customers to stop international roaming, at low cost, at any time—including from an overseas location.
- A notification to be sent via SMS to customers of service providers giving them pricing information for using a range of roaming services. These services include any that would normally be free in the domestic market, such as receiving a call on a mobile device.
- Spend management tools, including notifications in \$100 increments for data usage and notifications at 50, 85 and 100% of included value, if a customer has purchased an included value travel package from their IMR service provider.

The current draft Telecommunications Legislation Amendment (International Mobile Roaming) Bill 2014 (the IMR Bill) would, if enacted, enable the Australian Competition and Consumer Commission

(the ACCC) to, where necessary, take coordinated regulatory action with the New Zealand competition regulator, the New Zealand Commerce Commission (the NZCC)<sup>11</sup>.

A possible remedy foreshadowed in the Explanatory Memorandum to the Bill is the imposition of retail price caps (or other price-control arrangements) on IMR services sold to Australian customers travelling overseas.

This is following the same path taken in Europe where in 2012 the European authorities set price caps on both retail and wholesale roaming prices. BEREC (an association of European telco regulators) considered that the €0.10/MB (12 to 16 cents Australian) cap on data roaming was comfortably above costs which is said could be below €0.05/MB (6 to 8 cents)<sup>12</sup>.

But, the Europeans have moved on. On 3 April 2014, the European Parliament voted by 534 votes to 25 to end roaming fees within the European Union from 15 December 2015<sup>13</sup>. If this is ratified by member governments, any service offered by a mobile operator must not cost more when roaming than on the mobile operator's own network.

That looks like a great idea. It looks like the end-point for the Australian IMR Bill suggests that *"if prices for TTMR (Trans-Tasman Mobile Roaming) services continue to converge with domestic prices, the necessity for the ACCC to impose price regulation using the measures contained in the IMR Bill will likely diminish"*.

Why wait? Under the proposed Bill, *"The ACCC would also be able to make price -control determinations imposing price -control arrangements other than price caps, or setting principles that carriers and carriage service providers must comply with when altering their prices"*. (Explanatory Memorandum to Bill, emphasis added).

National regulators lack the jurisdiction to regulate wholesale prices charged by foreign operators and, sometimes, have little motivation to do so regarding wholesale charges in their home countries, as this may only benefit foreign roaming roamers in that country. But there is a political will for Australia and New Zealand to act in concert. That could happen now and other countries happy to make simultaneous changes could follow (UK and USA next?).

John de Ridder

1 July 2014

---

<sup>11</sup> [http://www.communications.gov.au/mobile\\_services/international\\_mobile\\_roaming](http://www.communications.gov.au/mobile_services/international_mobile_roaming)

<sup>12</sup> BEREC (Body of European Regulators for Electronic Communications) Analysis of Wholesale Roaming Costs, February 2012

<sup>13</sup> <http://www.bbc.com/news/world-europe-26866966>

## References

ACCC Mobile Services Review: International inter-carrier roaming. A final report on the provision of international inter-carrier roaming services, September 2005 [[mainly voice](#)]

BEREC (Body of European Regulators for Electronic Communications)

- International Roaming, Benchmark Data Report July 2011 – December 2011, May 2012
- Analysis of Wholesale Roaming Costs, February 2012

Department of broadband communications and the digital economy (DBCDE)

- with Ministry of Business Innovation and Employment (New Zealand), Trans-Tasman Roaming, Final report, 8 February 2013
- with Ministry of Economic Development (New Zealand), Trans-Tasman Roaming Discussion Document, April 2010 and submissions at [http://www.dbcde.gov.au/mobile\\_services/mobile\\_roaming/trans-tasman\\_mobile\\_roaming\\_discussion\\_paper](http://www.dbcde.gov.au/mobile_services/mobile_roaming/trans-tasman_mobile_roaming_discussion_paper)
- with Ministry of Economic Development (New Zealand), Technical description of international mobile roaming, May 2010 at [http://www.archive.dbcde.gov.au/2013/publications/2010\\_publications/revise\\_publications/trans-tasman\\_mobile\\_roaming\\_discussion\\_papersupporting\\_documents](http://www.archive.dbcde.gov.au/2013/publications/2010_publications/revise_publications/trans-tasman_mobile_roaming_discussion_papersupporting_documents)
- with Ministry of Economic Development (New Zealand), Analysis of retail trans-Tasman mobile roaming prices: methodology, assumptions and price data, May 2010 at [http://www.archive.dbcde.gov.au/data/assets/pdf\\_file/0006/127707/Analysis\\_of\\_retail\\_trans-Tasman\\_mobile\\_roaming\\_prices.pdf](http://www.archive.dbcde.gov.au/data/assets/pdf_file/0006/127707/Analysis_of_retail_trans-Tasman_mobile_roaming_prices.pdf)

KPMG report to DBCDE on International Mobile roaming charges, June 2008

[http://www.dbcde.gov.au/data/assets/pdf\\_file/0005/86369/KPMG\\_Report\\_of\\_findings\\_on\\_International\\_Mobile\\_roaming\\_charges.pdf](http://www.dbcde.gov.au/data/assets/pdf_file/0005/86369/KPMG_Report_of_findings_on_International_Mobile_roaming_charges.pdf) [voice only focus]

NITA (Danish regulator), Analysis of Prices and Costs for Mobile Data Services Abroad, dated June 2008, available at <http://en.itst.dk/interconnection-and-consumer-protection/filarkiv-international-roaming/Analyse%20af%20priser%20og%20omkostninger%20for%20brug%20af%20mobile%20data%20tjenester%20i%20udlandet.pdf>

OECD: International Mobile Data Roaming, Working Party on Communication Infrastructures and Services Policy, 30 May 2011 at <http://www.oecd.org/internet/broadband/48127892.pdf>

Patterson, Ross (NZ Commerce Commission), presentation to the Asia-Pacific Regulators Forum, 31 March 2012 at <http://www.comcom.govt.nz/presentation-to-itu-trai-asia-pacific-regulators-round-table-31-march-2012/>

Vrolijk E. & Bouwman R.'s study 'Roaming data services' by Connect2Roam, 24 June, 2008

WIK-Consult, Trans-Tasman Roaming: Service Costs. Report to the DBCDE, May 2012 at <http://www.med.govt.nz/sectors-industries/technology-communication/communications/mobile-phones/trans-tasman-roaming>

## Attachment 1 – Mobile data rates at June 2014

### Telstra

<b>Domestic</b>		<b>Bring your own (SIM only) plans</b>				<b>Excess</b>
Post-paid	\$ pm	45	55	70	95	
	GB	0.5	1.5	2.5	3	
	cents/MB	8.8	3.6	2.7	3.1	3
Pre-paid	\$ pm	55	70	95	130	
	GB	0.5	1.5	2.5	3	
	cents/MB	10.7	4.6	3.7	4.2	3
<b>Data Packs</b>		<b>Same for pre and post paid</b>				<b>Excess</b>
Domestic	\$	5	15	30	60	
	GB	0.25	1	3	6	
	cents/MB	2.0	1.5	1.0	1.0	3
<b>Casual traveller data packs</b>						
Overseas	\$	29	85	160	350	
	GB	0.1	0.3	0.6	1.5	
	cents/MB	28.3	27.7	26.0	22.8	300
<b>pay-as-you-go</b>						
	cents/MB	300.0				

### Optus

<b>Domestic</b>							
Postpaid	<b>SIM only</b>	<b>New and existing customers</b>					
	\$ pm	25	40	65			
	GB	0.2	1	2			
	cents/MB	12.2	3.9	3.2			
	<b>My Plan</b>						
	\$ pm	35	50	60	80	100	
	GB	0.2	0.5	1.5	2	3	
	cents/MB	17.1	9.8	3.9	3.9	3.3	
	<b>My mobile broadband plan</b>						
	\$ pm	5	20	30	45	60	
	GB	0.1	1.5	4	7	10	
	cents/MB	4.9	1.3	0.7	0.6	0.6	
Prepaid	<b>Prepaid mobile broadband recharge options</b>						
	\$ pm	10	30	50	80	130	
	GB	0.3	3	5	8	15	
	cents/MB	3.3	1.0	1.0	1.0	0.8	
	Expires	30	30	60	90	365	

**Optus****Overseas**

All

**Casual for postpaid and prepaid customers**

\$ pm 0

GB na

cents/MB 50 Charged in 10kB increments

Postpaid

**Travel Pack for postpaid customers**

\$ 10 per day (includes unlimited talk and text and 50MB)

MB 70

cents/MB 14.3

Prepaid

**Prepaid travel packs**

\$ 45 85

MB 90 170

cents/MB 50 50

**Vodafone****Domestic**

Postpaid \$ pm 20 30 35 45 50 65 85

GB 0.3 0.5 1 1.5 3 5 10

cents/MB 6.5 5.9 3.4 2.9 1.6 1.3 0.8

Prepaid \$ pm 10 19 29 39 49 75 125 200

GB 0.2 0.6 2 3 6 8 15 22

cents/MB 4.9 3.1 1.4 1.3 0.8 0.9 0.8 0.9

Expiry 15 20 30 30 30 90 365 365

**Overseas Pay-as-you-go rate**Postpaid **Casual**

\$ 1

MB 1

cents/MB 100

Postpaid **\$5/day assuming avg daily use**

Plan 20 30 35 45 50 65 85

1 day

(GB) 0.01 0.02 0.03 0.05 0.10 0.17 0.33

cents/MB 48.8 29.3 14.6 9.8 4.9 2.9 1.5

Prepaid

\$

MB 1

cents/MB 5120