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27 July 2011

Lauren Zhu
cc Julian James
Communications Group
Australian Competition and Consumer Commission

By email

lauren.zhu@accc.gov.au
julian.james@accc.gov.au

Dear Lauren,

Macquarie Telecom's Submission in relation to the ACCC's Review of Domestic Mobile Termination Access Service (MTAS) – June 2011 – Discussion Paper

Macquarie Telecom Pty Limited ('**Macquarie**') appreciates the opportunity to make this submission to the Australian Competition and Consumer Commission ('**ACCC**') in relation to the ACCC's Discussion Paper of June 2011 entitled *Domestic Mobile Terminating Access Service (**MTAS**): Public Inquiry to make an Access Determination.*

Prima facie, the case for a material MTAS price reduction is compelling, as the current MTAS indicative price of 9 cents per minute is well above international benchmarks and the underlying cost of its provisioning. An over-priced MTAS results in sub-optimal market outcomes which are to the detriment of end users. Macquarie is therefore strongly supportive of significant changes to the current MTAS regime including *inter alia* the promulgation by the ACCC of:

- A final access determination for the MTAS ('**MTAS FAD'**) which embraces significantly lower MTAS rates subject to certain conditions for fixed to mobile ('**FTM**') calls and for mobile to mobile ('**MTM**') calls;
- An indicative MTAS price to be based on international benchmarking (and to be confirmed as required by the ACCC using cost based studies) for three (3) years embodying a substantial initial reduction to 3.5 cents per minute from 1 January 2012. A significant early reduction is consistent with global precedents; and
- New record keeping rules ('**RKRs**') which apply to integrated operators (namely Telstra and SingTel Optus) requiring them to report their average FTM retail prices on a quarterly basis in order to secure lower MTAS rates. Such mechanisms are, Macquarie believes, consistent with the transition to the new National Broadband Network ('**NBN**') environment.

Macquarie's compelling arguments, in support of the above, which are designed to frame MTAS regulation and result in more efficient markets and improved consumer benefits are detailed in an Attachment to this letter.

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Macquarie would be pleased to engage directly with the ACCC going forward to elaborate on its thinking on these important matters. Should you have any queries concerning this submission, please feel free to contact me.

Yours sincerely

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ATTACHMENT

Macquarie Telecom's Submission In Relation To The ACCC's Review Of Domestic Mobile Termination Access Service (MTAS) – June 2011 – Discussion Paper

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1. INTRODUCTION

Macquarie Telecom Pty Limited ('**Macquarie**') appreciates the opportunity to make this submission to the Australian Competition and Consumer Commission ('**ACCC**') in relation to the ACCC's Discussion Paper of June 2011 entitled *Domestic Mobile Terminating Access Service (**MTAS**): Public Inquiry to make an Access Determination.* This Attachment details Macquarie's submission on the issues raised by the Discussion Paper and its various appendices.

Macquarie's submission is divided into three main sections – firstly, a summary of the Key Points, secondly General Comments and lastly, Macquarie's specific comments in relation to the ACCC's 32 questions posted in the Discussion Paper. Please note that references to section numbers in the submission are references to sections in the Discussion Paper.

2. SUMMARY OF KEY POINTS

Prima facie, Macquarie considers that the case for a material MTAS price reduction is compelling. This is because the current MTAS indicative price of 9 cents per minute is well above international benchmarks and the underlying cost of its provisioning. An over-priced MTAS results in sub-optimal market outcomes which are to the detriment of end users. Macquarie is therefore strongly supportive of significant changes to the current MTAS regime including *inter alia* the promulgation by the ACCC of:

- A final access determination for the MTAS ('**MTAS FAD**') which embraces significantly lower MTAS rates subject to certain conditions for fixed to mobile ('**FTM**') calls and for mobile to mobile ('**MTM**') calls;
- An indicative MTAS price is to be based on international benchmarking (and to be confirmed as required by the ACCC using cost based studies) for three (3) years embodying a substantial initial reduction to 3.5 cents per minute from 1 January 2012; and
- New record keeping rules ('**RKRs**') which apply to integrated operators (namely Telstra and SingTel Optus) requiring them to report their average FTM retail prices on a quarterly basis in order to secure lower MTAS rates. Such RKRs being necessary to address the fact that integrated operators have little incentive to pass through MTAS price reductions to their fixed network retail customers. Such mechanisms should facilitate the pass through of any reduction in MTAS going forward. Such mechanisms are also, Macquarie believes, consistent with the transition to the new National Broadband Network ('**NBN**') environment.

The arguments detailed in Macquarie's general comments and the answers to specific questions raised in the Discussion Paper are designed to frame MTAS regulation and result in more efficient markets and improved consumer benefits.

3. GENERAL COMMENTS ON THE DISCUSSION PAPER

Macquarie's general comments are divided into four sections namely:

(i) The context: International trends in Interconnection charges (section 3.1);

(ii) Drivers of reductions in mobile termination charges (section 3.2);

(iii) Benchmarking mobile termination charges in foreign jurisdictions (section 3.3); and

(iv) How wireless technology innovations are further affecting mobile termination costs (section 3.4).

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3.1 The context: International Trends in Interconnection Charges

As the ACCC will be aware, since the liberalisation of telecommunications markets around the world began around 20 years ago, various trends in interconnection charges have become evident. Such trends are a result of the forces which shape the overall telecommunications sector. Exhibit 1 below summarises the international trends in interconnection charges with the move away from traditional telephony to emerging IP context.

Exhibit 1: Trends in Interconnection Charges and Driving Forces

Factor	PSTN-Cellular Networks	IP-Based Networks
Causation	Caller triggers the call using facilities provided - or paid for - by the caller's carrier	The traffic types are varied and it is unclear which party triggers the exchange
Revenue stream	Call costs (and margin) paid for by the call initiating subscriber	Generated by subscriber access flat rates and advertising
Traffic measurement	Symmetrical traffic with calls and minutes monitored and measured	Asymmetric traffic, so measurement is possible but not necessarily clear who should pay
Parties	Just two carriers at each end of circuit established for duration of the call	Many carriers may be involved in handing off packets on a best efforts basis
Model	Framework developed by the ITU on a multilateral basis between countries with Calling Party Network Pays ('CPNP') is the preferred regime	The model evolved from zero cost peering to a commercial hierarchy of peers and clients with Sender Keeps All ('SKA') emerging as the preferred regime
Technical interconnection	Carriers interconnect at agreed POIs	Unregulated connection through peering or transit
Routing	Calls are routed on a dialled number, circuit switched with end-to-end signalling	Packets routed on IP header on best effort basis through connectionless protocol
Network characteristics	Intelligent network elements contained at the core	Intelligent network elements contained at the edge

Source: Windsor Place Consulting, 2011

In essence, the global migration to next generation networks ('**NGN**') including both fixed and mobile networks, breaks the historic linkage between communications services and networks, facilitating the growth of independent service providers. Traditional concepts in relation to connectivity, access and interconnection payments are likely to change as the industry moves into an IP environment where:

- More fixed charges between operators will be based on capacity;
- Fewer variable charges will be based on the volume of traffic;
- Differential interconnection costing may apply at service, transport and control layers, leading to more specialised and segmented interconnection markets; and
- The overall value of interconnection payments between operators may decline.

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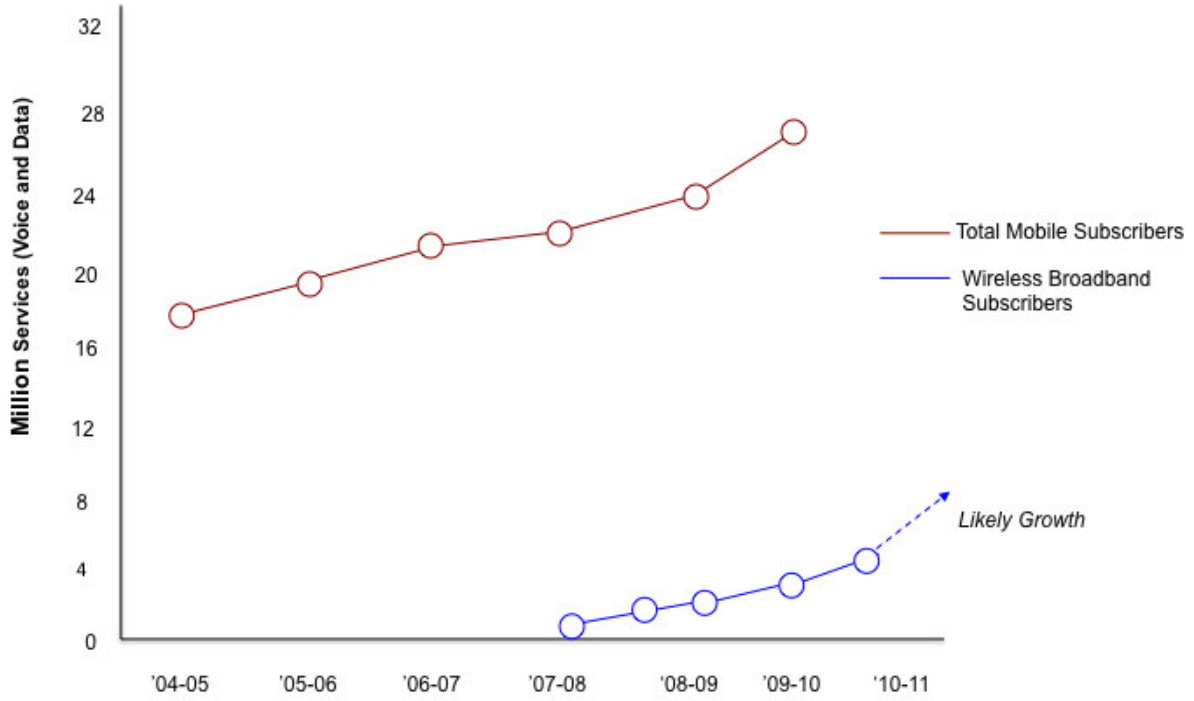
3.2 Drivers of reductions in mobile termination charges

In most world markets there is a well established trend to substantially reduce mobile termination rates ('**MTRs**'), towards current fixed interconnection rates for a range of factors that include *inter alia*:

- Rapid growth of subscribers and traffic result in increased economies of scale and scope for mobile operators (equipment costs, costs of spectrum etc) which arguably translate into lower cost structures and wholesale rates. The historical growth in mobile and wireless broadband subscribers in Australia is depicted in Exhibit 2 while Exhibit 3 over shows likely global and regional wireless data growth.

- The great bulk of the investment made by Telstra, SingTel Optus and Vodafone Hutchison Australia ('**VHA**') (like foreign MNOs) on their mobile networks in the past 3 to 5 years has been supporting the significant growth in wireless broadband services. The revenue from mobile data now forms a significant share (ranging from 31 to 35 per cent) of the mobile sector's revenues.[1] Such a trend is likely to strongly continue in the future, especially based on foreign country market experience. Announced deployment of LTE and HSPA+ network upgrades are indicative of such growth and such investments are certainly not required to provide voice services.

Exhibit 2: Growth in mobile and wireless broadband subscribers in Australia



Source: ACMA and ABS Statistics, 2011 and earlier

[1] See ACCC, Telecommunications reports,
In 2008-09, mobile data was responsible for 33 per cent of Telstra's revenue of the sector (compared with 28.7 per cent in the previous reporting period). Data contributed 35 per cent of SingTel Optus' revenue in 2008-09 up from 31 per cent in 2007-08 while 31.2 per cent of Hutchison's then revenue was derived from mobile data services in the first half of 2009.

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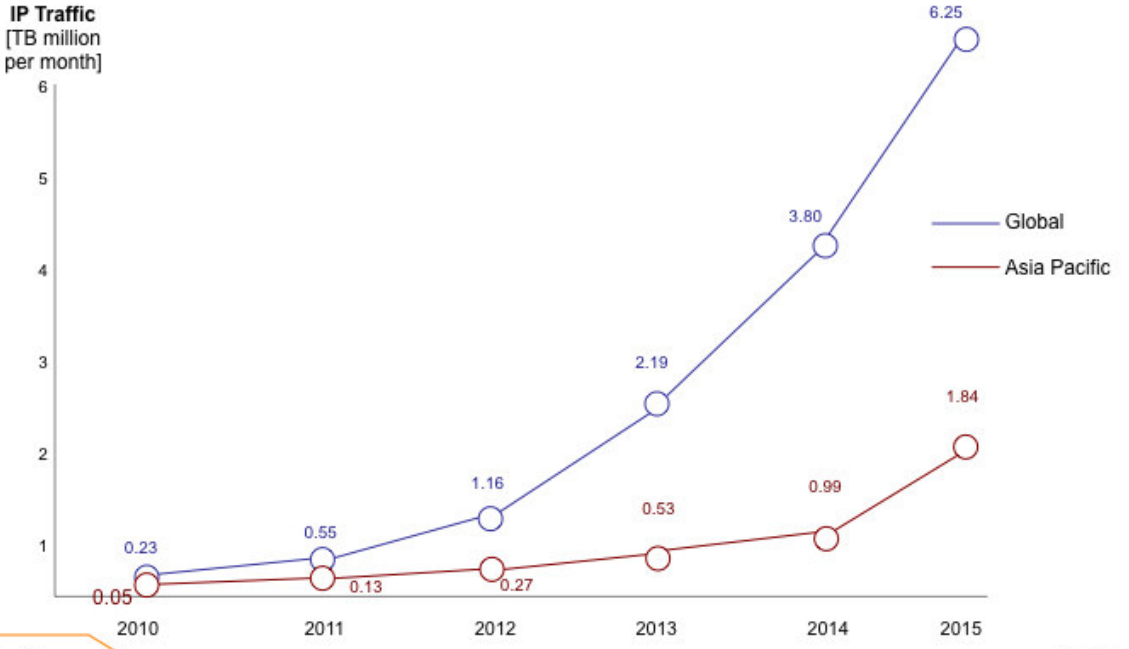
Exhibit 3: Overall Mobile Data Traffic Growth 2010 – 2015[2]



Selected Segments							CAGR
Data	0.07	0.16	0.32	0.56	0.89	1.41	80%
Video	0.12	0.29	0.65	1.33	2.45	4.15	104%
File sharing	0.03	0.06	0.11	0.18	0.26	0.38	62%

nb. CAGR – Compound Annual Growth Rate

- Mobile operators creating regulatory (and political) expectations of lower mobile termination costs by offering low or free 'on-net' calls' to their customers. There are a number of examples of such discounted on-net calls in Australia;[3]
- Active regulatory intervention, including increased scrutiny of wholesale arrangements applicable to global roaming services in many country markets; and
- In addition, depending on the cost models used in a particular market, it is arguable that mobile carriers are currently overcompensated for voice interconnection given that the cost pool for termination charging includes network elements used to deliver data and content services (see Exhibit 4 below);

[2] According to the Cisco *Visual Networking Index Global Mobile Data Traffic Forecast* overall mobile data traffic is expected to grow to 6.3 Exabytes per month by 2015

[3] For example, see www.vodafone.com.au/personal/prepaid/home/options/txt-talk/

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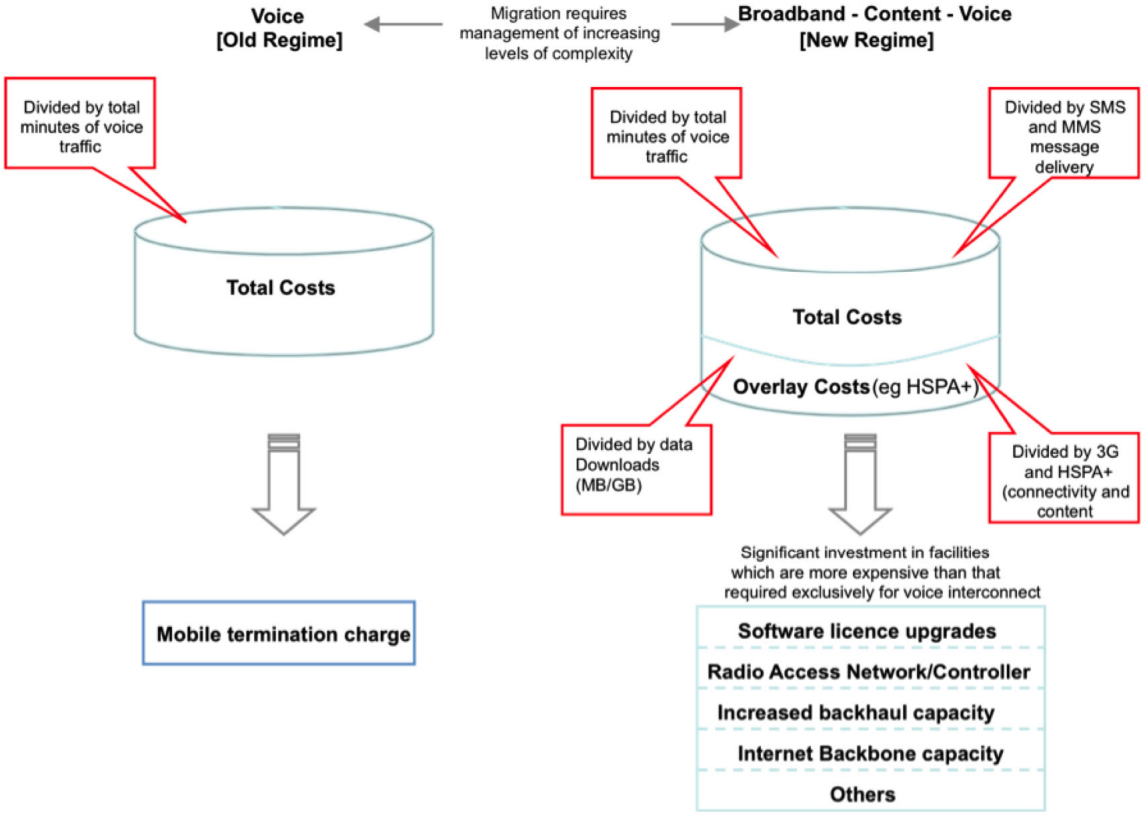
Exhibit 4: Changes in relevant mobile interconnect costs



Source: Windsor Place Consulting, 2008

- Notwithstanding the impacts of the global financial crisis, the Weighted Average Cost of Capital ('**WACC**') for mobile operators has fallen significantly, reflecting in part that their asset beta and their debt premium has reduced due to increasing maturity of mobile telecommunications networks and services. For example, in a recent detailed study for the Dutch regulator, OPTA, the mobile WACC fell from 11.55 per cent calculated in 2006 to 8.45 per cent in April 2010.[4] By way of comparison the fixed WACC for the incumbent operator KPN remained relatively constant at 7.5 per cent in April 2009 to a weighted level of 7.38 per cent in April 2010. It is also noted that the ACCC in its fixed service inquiry has lowered the WACC from 9.04 per cent to 8.54 per cent.[5]

- There is also a view by some analysts that moves for NBNs and the required investment in them, increasing fixed line revenue reductions, increased risks etc mean that fixed network operators may, going forward, face a higher WACC.[6]

All of the above drivers make a compelling case for the ACCC to promulgate a MTAS FAD which embraces significantly lower MTAS rates in the short term.

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[4] See Analysys Mason, *Report for OPTA, Conceptual approach for the fixed and mobile BULRIC models, Version after industry Comments*, 20 April 2010.

[5] ACCC, Inquiry to make final access determinations for the declared fixed line services, July 2011.

[6] See OVUM, *The impact of the credit crunch on telco's WACC and interconnection rates*, 2009. In Australia, with the recent signing of the NBN Co – Telstra Agreement it arguably means that such issues are resolved in Australia with Telstra receiving compensation of each and every customer which transitions to the NBN.

3.3 Benchmarking mobile termination charges

While MTRs have been decreasing globally over the last several years, they still vary widely across countries and regions of the world, reflecting their disparate regulatory treatment. While Appendix A contains detailed case studies on the setting of MTRs in Europe, India, New Zealand and the United Kingdom, Exhibit 5 below sets out the MTRs for selected countries as compared to Australia. The details of the MTRs and regulatory framework for the setting of those rates are summarised in Appendix B.

Exhibit 5: Global MTRs in order of AUD equivalent rates

Country	Previous MTR (per minute) (typically 2009)	Current MTR 2010/2011 (per minute)	Final MTR (per minute) (typically 2013 or 2014)	Per cent Reduction	Final MTR in AUD (per min)
Hong Kong[7]	HKD0.0545	Not regulated	Not regulated	N/A	Not known
Singapore[8]	0	0	0	N/A	0
Pakistan	PKR 1.3	PKR0.9	PKRH0.9	30%	0.0096
United Kingdom	£0.04	£0.0418 for 4 major operators, £0.0448 for H3G	£0.0069	83%	0.0104
France	€0.045, €0.06	€0.02[9]	€0.008[10]	82%	0.0106
Belgium	€0.072 to €0.1143	€0.0452 - €0.0568	€0.0108	85%	0.0143
Israel	ILS 0.254	ILS 0.0687	ILS 0.0555[11]	71%	0.0151
Malaysia	MYR0.0836	MYR0.05	MYR0.05	40%	0.0155
Indonesia	IDR 261	IDR 251	-	4%	0.0272
Sweden	SEK 0.32	SEK 0.265	SEK 0.19	38%	0.0277
New Zealand	N/A	NZD0.0748	NZD0.0356	52%	0.0283
Norway	NOK 0.60	NOK 0.30	NOK 0.17	72%	0.0289
Philippines	PHP 6, PHP 4	PHP 4	PHP 1.5	63%	0.0326
Germany	€0.0656, €0.0714	€0.0336 - €0.0339	€0.0336 - €0.0339	49%	0.0445
South Africa	ZAR0.89	ZAR0.73	ZAR0.40	55%	0.0545
Mexico	MXN1.21	MXN0.95	MXN0.69	27%	0.0546
Italy	€0.0936	€0.053	€0.045	52%	0.0596
Japan	JPY8.1	JPY5.22	JPY5.22	36%	0.0615
Brazil	USD0.20	USD0.20	USD0.09[12]	55%	0.0830
AUSTRALIA	**AUD0.09**	**AUD0.09**[13]	**TBA**	**TBA**	**0.0900**
Chile [14]	CLP77.98	CLP77.26	CLP76.42	2%	0.1524

Source: Windsor Place Consulting analysis of industry sources, July 2011. Foreign exchange rates from www.xe.com as at 26 July 2011

[7] Following a review of the termination framework as part of an assessment of fixed-mobile convergence in 2006, OFTA completely deregulated mobile termination over a 2-year transition period culminating in the withdrawal of the mobile party network pays arrangement on 27 April 2009.

[8] For fixed-mobile and mobile-mobile calls Singapore has a Bill and Keep (BAK) arrangement with no provisions for compensation of traffic imbalances. For fixed-fixed and mobile-fixed calls a low cost-based termination rate (SGD0.0084) applies to all traffic that terminates on incumbent fixed networks

[9] Starting on 1 July 2011

[10] From 1 January 2013

[11] By 2014

[12] From 2011-2015

[13] Average rate from 1 January 2009 – 31 December 2011

[14] Accurate as of 2009.

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Based on the above comparison it is evident that Australia's current MTAS price is particularly high compared to a wide range of overseas jurisdictions. Macquarie, would argue that the disparity is so great that it is unnecessary to make any adjustments to reflect Australian conditions.[15] That is, with or without any such adjustment, the gap between Australia's current MTAS price and the rates applicable in overseas jurisdictions is particularly large and that a significant and immediate reduction in the current MTAS price is justified. In Macquarie's view, it considers that an immediate reduction to 3.5 cents per minute is justified. This initial reduction is similar to the reduction in other comparable markets including New Zealand as detailed in Exhibit 6 below.

Exhibit 6: Case Study: MTR in New Zealand

In 2007, New Zealand's Commerce Commission recommended the regulation of mobile termination. This was rejected by the Minister of Economic Development in favour of binding commitments by Telecom NZ and Vodafone NZ.

After considerable regulatory reviews and commercial moves by operators, finally in May 2011, the Commission released the *Standard Terms Determination for the designated services of the mobile termination access services (MTAS) fixed-to-mobile voice (FTM), mobile-to-mobile voice (MTM) and short messaging services (SMS).* The Commission decided *inter alia* that the MTRs will drop to less than 4 cents by 1 April 2012, with further reductions until 2014 while termination rates for text messages will drop to 0.06 NZ cents from 6 May 2011. The schedule for wholesale MTR are as follows (i) 6 May 2011: 7.48 c/min (ii) 1 October 2011 5.88 c/min (iii) 1 April 2012: 3.97 c/min (iv) 1 April 2013 3.72 c/min (v) 1 April 2014 3.56 c/min.

For more information, see the detailed case study on New Zealand in Appendix A.

3.4 How wireless technology innovations are further affecting mobile termination costs

Macquarie would like to highlight that there are a number of wireless technology innovations which are having a material impact on the cost of mobile voice call termination going forward. In Appendix C, Macquarie highlights three of those innovations which are reducing termination costs, and should be taken into account in the ACCC's future cost modelling namely:

(i) Voice over LTE ('**VoLTE**'). Similar to the termination of voice calls in 3G networks which are cheaper than the termination of voice calls on 2G networks, it is expected that the termination of voice calls on LTE and future 4G networks (e.g., LTE-A) will even be cheaper as the cost of terminating a voice call as part of a broadband IP stream will be low;

(ii) Wi-Fi offloading. The current utilisation of Wi-Fi off-loading in Australia and its likely increased future use, would suggest that in certain scenarios where Wi-Fi is used for voice termination the cost is likely to be significantly reduced as the number of mobile network elements is significantly reduced. If a large proportion of calls are transported and terminated in this manner then falls in cost may be considerable; and

(iii) Deployment of femtocells. Similar to Wi-Fi off-loading, should the deployment of femtocells accelerate (perhaps facilitated by the NBN) then a growing proportion of voice calls terminating on mobile numbers will in fact be terminating utilising fixed network rather than mobile network infrastructure.

In Macquarie's view such cost factors should be considered by the ACCC when determining both the quantum of the target MTAS price and the slope of any glide path. Given the likely uptake of such technologies, as announced by the MNOs themselves, there is a material risk that if the slope of the glide path is gentle then there will be a high degree of continuing over-compensation to the MNOs. Such technology innovations would suggest that mobile termination costs should be similar or equal to fixed network termination costs in the near term.

[15] Specifically, large and small countries, developed and emerging markets, markets with more and less competition all have MTRs significantly below the rate applying in Australia.

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4. CONCLUSIONS AND SUGGESTED WAY FORWARD

In closing, Macquarie considers that it is timely for the ACCC to review the appropriate regulatory approach for MTAS. From Macquarie's perspective, the Australian mobile sector has grown substantially and evolved significantly since the current regulatory approach was put in place. A new approach is required to regulating MTAS which leads to substantially lower charges than continuation of the current system. This in turn would create greater benefits for consumers and promote competition. In particular, lower MTAS charges will *inter alia*:

- Lead to falling retail mobile prices and increase efficiency through aligning charges more closely with relevant cost structures;
- Assist operators to compete on a level playing field, regardless of their balance of incoming and outgoing traffic and size;
- Reduce the inherent subsidy from fixed to mobile services in Australia which in part has arguably promoted fixed to mobile substitution by creating a greater price differential for MTM versus FTM voice calls;
- Facilitate investment by fixed network operators like Macquarie in the provision of services over the NBN. Macquarie and other service providers face a range of back office and additional costs as part of the migration to the NBN over the next eight years;
- Reduce a significant proportion of the cost underlying retail fixed to mobile prices providing the opportunity for them to fall; and
- Increase telecommunications usage through these lower prices.

Against this background, given the high Australian MTRs in absolute terms and the number of compelling global precedents supported by quality costing analysis (which would support a material reduction in MTRs in those foreign markets), Macquarie considers there is a strong case for change over the next three years in Australia. It is considered that any regulation of MTRs should be done in a strategic manner given the wide reaching impacts of MTRs on competition in mobile and the wider communications sector. Certainly there is no case for the continuation of current high MTAS indicative prices which were extended by the ACCC from 2009 until end of 2011 given the uncertainties that then existed as part of the global financial crisis.

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5. SPECIFIC RESPONSES TO QUESTIONS IN THE DISCUSSION PAPER

Question 1

Is the flow of voice traffic between any pair of mobile network operators broadly symmetrical?

Macquarie has no relevant data at its disposal to address this question. Macquarie does, however, note that based on the experience of other country markets, traffic between Telstra, SingTel Optus and VHA is likely to be consistent with their respective customer bases and broadly balanced between the three network operators.

Question 2

Is there any evidence which suggest that retail pricing of FTM services reflects the reducing cost of MTAS?

In general terms, Macquarie considers that as MTAS is a key input cost to FTM calls there ought be a relationship between it and the retail pricing of FTM services.

While this is not always seen in practice, as a consequence of the lack of effective competition in the retail market for FTM calls, in the case of Macquarie its retail pricing of FTM services is strongly correlated with the earlier reductions in the cost of MTAS as show in Exhibit 7 below. As such there is a strong case to argue that Macquarie has passed on the reductions in the MTAS cost, even though in many cases Macquarie pays higher interconnection costs than the indicative MTAS rate of 9 cents per minute.

[Commercial in Confidence]

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The exhibit shows Macquarie's average retail FTM price and the MTAS cost by month for the period from July 2005 to May 2011. It is evident that the retail FTM price has fallen by an amount greater than the fall in the MTAS cost.

[Commercial in Confidence]

Question 3

Are MNOs likely to negotiate BAK-based access agreements for MTM calls commercially, and if so, within what timeframes?

Macquarie believes that only the MNOs can truly address this question. However, Macquarie is prepared to speculate that while Telstra retains its dominant market position in Australia's telecommunications sector, encompassing fixed line, mobile, broadband and pay TV services, it is unlikely that VHA and SingTel Optus would be prepared to negotiate BAK-based access agreements with Telstra. This view reflects a deep-seated mistrust of Telstra and the reality that while traffic flows between the MNOs are balanced, the benefit to any MNO in shifting to BAK is perceived as being marginal.

In addition, while there may be benefits to the MNOs of moving to a BAK system for MTM calls, including reductions in wholesale billing and call processing costs (at the MSC), it is also likely that the MNOs would prefer not to implement a BAK system at this time. This is because the current system reinforces both the requirement for and the quantum of the MTAS price to be paid by fixed network operators for FTM calls.

Question 4

Should the ACCC set a price of zero for MTM termination in the MTAS FAD?

BAK arrangements are appropriate where traffic flows between MNOs are broadly balanced. While traffic flows remain balanced, the benefit of BAK arrangements are essentially a saving in call processing and the administration of payments between the MNOs. However, if traffic becomes imbalanced then arguably one MNO gains a benefit and the other MNO suffers a loss.

In Macquarie's view, setting of prices is essential to the effective operation of markets. The termination of call traffic is not a zero cost. If the ACCC were to set a price of zero for MTM termination, there would be no effective discipline on market behavior which could create an opportunity for arbitrage activities. Further, and perhaps more importantly, Macquarie would highlight to the ACCC that an MTAS price is critical in helping to set market price guidance for MTM (including both on-net and off net) services that Macquarie (and other licensees) purchase from the MNOs including end to end services and for mobile virtual network operator ('**MVNO**') services. If this is not done then there could be an adverse impact on other competitive services.[16] As such, Macquarie is strongly of the view that should the ACCC continue to regulate MTM termination a cost-based price should ultimately be set.

[16] It is arguable that high MTM prices have had a negative impact on the creation of a vibrant MVNO market in Australia compared with other comparable country markets. With recent mobile market consolidation there is a strong case for the ACCC to ensure that the future MTAS FAD and other elements of the regulatory regime supports and facilitates greater competition in this market segment.

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If the ACCC does decide to set a zero price for MTM termination then care will need to be taken in the crafting of the terms of the MTAS FAD as it is pertains to what is MTM termination. This is because the termination of calls on the networks of retail service providers who are utilising NBN Co's fixed wireless system (which will be TD-LTE at 2.3 GHz) and is capable in the future of providing voice over LTE ('**VoLTE**') (even if this capability is not initially deployed) should not fall within the scope of such a determination.

Question 5

If commercial BAK arrangements for MTM termination were implemented successfully, should MTM termination be deregulated?

Macquarie considers that outcomes reached by competitive markets are generally preferred to regulated outcomes. As noted above in response to question 3, Macquarie considers it unlikely that commercial BAK arrangements will emerge. However, if such arrangements did in fact emerge, there would appear to be a case for the ACCC to deregulate MTM termination. For example, Macquarie notes that in Singapore which has instituted BAK regimes for MTM calls, dominant licensees are required to obtain the regulator's approval for charges for IDA specified interconnection and/or network charges.

Question 6

If MTM termination was deregulated, how would any-to-any connectivity be maintained?

Any-to-any connectivity is a concept by which customers of any given network can make (and receive) calls to (and from) customers of any other network. This principle is maintained by the obligation of MNOs to interconnect with each other. Whether or not MTM termination is regulated, MNOs remain obligated to interconnect with each other. As such, Macquarie does not believe that any-to-any connectivity would be at risk if MTM termination was deregulated.

Question 7

Should reductions in the MTAS rate be subject to a pass-through safeguard for fixed or integrated operators?

Macquarie notes the ACCC's concern that Telstra has evidently not passed on reductions in MTAS prices for its fixed to mobile customers. As shown in the response to question 2, Macquarie has more than fully passed on MTAS reductions to its own FTM retail customers.

To address the ACCC's concern, Macquarie is of the view that differential regulation of the MTAS price should apply in the provision of FTM services. In particular, integrated operators, (those which are MNOs and fixed network operators) should be denied any reduction in the MTAS price unless they can demonstrate to the ACCC's satisfaction that they have already sufficiently reduced their retail FTM prices. All other operators which provide retail FTM services would have unconditional access to reductions in the MTAS price as set by the ACCC.

Macquarie envisages the ACCC promulgating a MTAS FAD which contains the following in respect of FTM services:

- an MTAS price for integrated operators which is equal to the current MTAS price and which is subject to periodic ACCC review; and
- an MTAS price for non-integrated operators which is determined by the ACCC on a cost basis.

Integrated operators should be subject to a record keeping rule ("**RKR**") under section 151BU of the *Competition and Consumer Act 2010.* Such a RKR would require integrated operators to report on a quarterly basis to the ACCC their respective:

- average retail price per minute of fixed to mobile calls for all customers;
- average retail price per minute of fixed to mobile calls for residential customers;
- average retail price per minute of fixed to mobile calls for business customers;
- average revenue per call of fixed to mobile calls for all customers;
- average revenue per call of fixed to mobile calls for residential customers; and
- average revenue per call of fixed to mobile calls for business customers.

In all of the above cases, fixed to mobile services provided in a bundle of services where prices are not specified for the fixed to mobile service should not be included.

On the ACCC's consideration of the data reported under the RKR, the ACCC may vary the MTAS price applicable to integrated operators via a variation to the MTAS FAD. In deciding whether to vary the MTAS price applicable to such operators, the ACCC must consider the extent to which such operators have passed on previous MTAS price reductions, the extent to which such pass through has benefited all classes of customers and reductions in retail FTM prices which have been achieved. In particular, Telstra's average FTM retail price would need to fall to below 27 cents per minute to ensure that past MTAS price reductions have been passed through to customers. The ACCC may vary the MTAS price applicable to integrated operators no more than once in a six month period.

Under the mechanism proposed by Macquarie, no specific pass through requirement applies to non-integrated operators. As shown above in response to question 2, Macquarie has demonstrated that past MTAS price reductions have been more than fully passed on to customers. On this basis, the ACCC need not require specific regulation of pass through for non-integrated operators.

The need for a mechanism to ensure the pass through of any reductions in MTAS prices by integrated operators is also arguably supported by overseas studies. In a European study which examined theory, academic literature, relevant European experience, as well as econometric methods to study the impact of MTRs on retail price and demand for 61 mobile operators from 16 European countries in the period from 2003 to 2008, the authors found that:

> *"… lower MTRs tend indeed to result in a lower average retail unit price, with a highly significant coefficient of +0.71. That the coefficient is less than +1.0 confirms the existence of a "waterbed effect". Our results also demonstrate, with high significance, that lower MTRs (presumably operating through the mechanism of lower retail prices) tend to result in greater consumption of mobile services in terms of minutes of use per month per subscription. Long term elasticity (in the range of -0.52 to -0.61) is much greater than short term elasticity (-0.097)."*[17]

Question 8

If a percentage pass-through obligation is adopted, should pass-through occur at the same time, or after the reduction in the MTAS rate? What is the most effective way for the ACCC to monitor compliance with the provision?

As discussed above, Macquarie considers that pass-through of MTAS price reductions should be implemented through the differential regulation of the MTAS price in the provision of FTM services as between integrated operators and all other operators. The mechanism proposed by Macquarie requires an integrated operator to satisfy the ACCC that retail FTM prices have been reduced (including the impact of past MTAS price reductions) before further MTAS price reductions are made available. The ACCC would monitor changes in retail FTM prices through the use of RKRs.

[17] Christian Growitsch, J. Scott Marcus & Christian Wernick, *The Effects of Lower Mobile Termination Rates (MTRs) on Retail Price and Demand*, Communications and Strategies, 80, 4th Quarter, 2010, page 119.

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Question 9

If a 'retail-minus' approach is adopted, should integrated operators lodge their average retail prices with the ACCC? If so, how often should retail prices be reviewed?

As discussed above, Macquarie considers that pass-through of MTAS price reductions should be implemented through the differential regulation of the MTAS price in the provision of FTM services as between integrated operators and non-integrated operators. As such, Macquarie considers that a "retail-minus" approach is not appropriate to achieve pass through.

Question 10

If a 'retail-minus' approach is adopted, what should the floor price be before integrated operators can return to the standard MTAS price set out in the FAD?

As discussed above, Macquarie considers that pass-through of MTAS price reductions should be implemented through the differential regulation of the MTAS price in the provision of FTM services as between integrated operators and non-integrated operators. As such, Macquarie considers that a "retail-minus" approach is not appropriate to achieve pass through.

Question 11

What factors should the ACCC consider in setting a minimum level of pass-through?

In the context of the FTM pass through mechanism proposed by Macquarie, the integrated operator(s) must first demonstrate that that retail FTM prices have been reduced (including the impact of past MTAS price reductions) before a further MTAS price reduction is made available. That is, the extent of an MTAS reduction would be no more than the retail FTM price reduction which must have already been achieved. For non-integrated operators no pass through regulation is applied.

Question 12

Are there other pass-through safeguard measures that promote the LTIE?

Macquarie believes that the pass through mechanism proposed in its response to question 7 is the most appropriate for promoting the LTIE. In particular, this mechanism applies regulation to the situation where past MTAS reductions have not been passed through to customers, i.e., Telstra's FTM traffic.

Question 13

Does TSLRIC+ remain an appropriate methodology for deriving an MTAS price?

The recent practice in leading overseas jurisdictions is that pure LRIC has become the appropriate methodology for deriving an MTAS price. As such, Macquarie believes that TSLRIC+ is not an appropriate methodology for deriving an MTAS price. This view is consistent with the ACCC's preliminary view (and that of the Australian Competition Tribunal) outlined in the Discussion Paper that given the changes in the market and policy, the TSLRIC+ methodology may not be flexible enough to deal with new issues and as such is longer appropriate going forward.

Question 14

Is a new cost model required to estimate the price of the MTAS using a TSLRIC+ pricing methodology?

No. As noted above in response to question 13, the recent practice in leading overseas jurisdictions is a switch to pure LRIC. As such, Macquarie believes that a new TSLRIC+ cost model is not appropriate for deriving an MTAS price.

Question 15

Is pure LRIC an appropriate methodology for deriving an MTAS price?

Yes. As noted above in response to question 13, pure LRIC has become the appropriate methodology for deriving an MTAS price in leading overseas regulatory jurisdictions.

Specifically, in May 2009 the European Commission adopted a *pure LRIC* approach to the determination of call termination costs.[18] It recognised that higher than necessary call termination charges distort competition and sustain retail charges to end customers at higher levels than otherwise. The pure LRIC approach recognises that an economically rational business would be prepared to accept only its long term incremental costs of providing new services (with the profit margin being recognised in the cost of capital), given that existing revenues already recovered the costs of shared and common costs. Pure LRIC for call termination was therefore determined to be appropriate. Pure LRIC is calculated by subtracting the efficient costs of the operation *without* call termination from the efficient costs *with* call termination.

In the UK, the Ofcom also adopted a charge control based on pure LRIC consistent with the 2009 EC Recommendation. Ofcom's view was that adopting pure LRIC would be more likely to promote efficiency, sustainable competition and would confer the greatest possible benefit on consumers.

Macquarie also considers that a pure LRIC cost model is able to cater for the move to NGN networks. As costing models should seek to reflect economic costs for future regulatory decision-making, rather than attempting to recover past expenditures, a pure LRIC model is able to model the costs applicable to those networks that would be installed today.

In all cases a network operator installing a new network in 2011 would install an IP-based NGN with appropriate soft- switches, IP processing and, where justified, high capacity LTE and fibre platforms. The traffic handling costs and network OPEX will be substantially below the unit costs of a circuit-switched network.

Macquarie is of the view that the development of a pure LRIC approach for deriving an MTAS price should be in LTIE and ought be the ACCC's medium term aim, i.e., over the next 2 - 3 years.

Question 16

Is international benchmarking an appropriate methodology for deriving the MTAS price?

Yes. International benchmarks are readily available, involve negligible cost and would enable the ACCC to quickly make an important regulatory adjustment. It is evident that Australia's current MTAS price is particularly high compared to MTRs in a wide range of overseas jurisdictions. Macquarie is of the view that international benchmarks suggest that a reduction in the MTAS price from 9 cents per minute to 3.5 cents per minute is justified.

[18] Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC)

See Exhibit 3 and Appendix B for international MTR benchmarks.[19]

Question 17

Which parameters should be adjusted so as to ensure a benchmarked result reflects Australia conditions?

As noted above in response to question 16, it is evident that Australia's current MTAS price is particularly high compared to a wide range of overseas jurisdictions. The disparity is so great that it is unnecessary to make any adjustments to reflect Australian conditions. That is, with or without any such adjustment, the gap between Australia's current MTAS price and the rates applicable in overseas jurisdictions is particularly large and that a significant and immediate reduction in the current MTAS price is justified.

Question 18

Are MNOs actual costs an appropriate methodology for deriving the MTAS price?

Macquarie considers that MNO actual costs are an appropriate methodology for deriving the MTAS price. This is because this is what happens in competitive markets, i.e., operators set prices based on their costs. Efficient competing operators will ensure that prices will be driven down to cost. Such a methodology might be worth considering by the ACCC provided that it has the support of MNOs. As noted above in response to question 16, international benchmarks should be used now by the ACCC to set new MTAS prices.

Question 19

On what basis could MNOs demonstrate that their actual costs are efficiently incurred?

MNOs could demonstrate that their actual costs are efficiently incurred by reference to international benchmarks.

Question 20

What is an appropriate timeframe for the MNOs to provide the ACCC with this information?

In Macquarie's view actual MNO costs should only be used to set MTAS prices with the support of MNOs. Macquarie envisages that international benchmarks would provide the initial basis for an immediate and significant reduction in the MTAS price. A pure LRIC based model would provide a medium to long term basis for setting the end point MTAS price. MNOs who disagree with the results of these approaches might then wish to provide their actual call termination costs to the ACCC.

[19] For the record, such benchmarks do include country markets (e.g., France) where there is a significant deployment of HD voice. While HD voice offers improved voice quality by encoding twice the audio bandwidth (50-7000Hz) of the current codecs (300-3400Hz) there is no difference in the regulated MTRs from Macquarie's review. It normally uses 12.6kbps of bandwidth to do this but can drop back to 8.85kbps and 6.6kbps during adverse radio conditions or periods of cell congestion and requires handset support. The first commercial HD voice service went live in September 2009 and the Global GSM Suppliers Association now lists 20 operators in 18 countries as offering this service.

Question 21

In the likely event that the MNOs provide the ACCC with different MTAS cost figures, how should the ACCC arrive at a single price for the MTAS in the FAD? For example, would a weighted average be appropriate and what weighting factors should be used?

In Macquarie's view this question is premature and presumptive. That is, the ACCC need not resort to the analysis of actual operator costs until it has assessed international benchmarks and considered the development of a pure LRIC cost model.

Question 22

Is a BAK system an appropriate methodology for the MTAS?

Macquarie considers that BAK is an appropriate methodology for the MTAS provided that traffic flows between operators are balanced and continue to be balanced and operators willingly enter into such arrangements. Having said that Macquarie would highlight to the ACCC that an MTAS price is important in helping to set the market prices for MTM (including both on-net and off net) services that Macquarie (and other licensees) purchase from the MNOs including end to end services.

In a report by Concept Economics[20] which evaluated the application of BAK for MTM termination, it was noted that the use of cost models can be time-consuming and expensive process, while benchmarking is vulnerable to differences in regulatory approaches across jurisdictions. On the other hand, BAK avoids the need to engage in any cost modeling, and is less costly to implement as it avoids the need for reconciliation, billing and payment collection.

Question 23

What is the traffic imbalance (if any) between FTM and mobile-to-fixed (MTF) calls?

Macquarie has no relevant data at its disposal to address this question.

Question 24

Should there be a glide path or a single transition point?

Building on the mechanism proposed in response to question 7, Macquarie considers that a glide path is appropriate. Macquarie's proposed glide path is shown in Exhibit 7 below.

Exhibit 7: Macquarie's proposed MTAS pricing glide path

Service Type		Current Price / Min	Year Ending 2012 Price / Min	Year Ending 2013 Price / Min	Year Ending 2014 Price / Min
MTM		9	3.5	2.5	1 (provisional)
FTM	**Integrated Operators**	9	9 initially, subject to ACCC review	Previous end of year rate, if not varied by ACCC	Previous end of year rate, if not varied by ACCC
	Non-integrated Operators	9	3.5	2.5	1 (provisional)

[20] See the report entitled *Bill and Keep Is the Mobile Termination Option Most in the Long Term Interests of End Users* dated 21 December 2008

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Macquarie considers that:

- A three year period for the MTAS FAD is appropriate;
- International benchmarks support an immediate and significant fall in the MTAS price for MTM and FTM (Non-integrated operators), i.e., a fall from 9 to 3.5 cents per minute;
- A further reduction of 1 cent and 1.5 cents per minute is appropriate for years 2013 and 2014 respectively for MTM and FTM (Non-integrated operators) and is supported by international benchmarks;
- The 1 cent per minute MTAS price end point for MTM and FTM (Non-integrated) for 2014 is provisional pending the ACCC's consideration of a pure LRIC based costing model and/or operator actual costs;
- Integrated operators begin 2012 with a 9 cents per minute MTAS price for its FTM traffic which may (in the second half year) be varied by the ACCC on its consideration of their RKR reports; and
- For integrated operators, the MTAS price for FTM traffic in years 2013 and 2014 is either the previous year's end of period rate or another rate set by the ACCC on its consideration of RKR reports.

Importantly, Macquarie would argue that the ACCC should reject any arguments put forward by the MNOs that higher MTAS prices are required to support:

- Investment in new LTE/4G networks when such networks are designed solely for non-interconnected wireless data services and not for the origination and/or termination of voice calls;
- Higher prices for spectrum acquisition. Decisions on spectrum acquisition are solely a competitive MNO decision and would be supported by their own internal valuation models. Consumers making FTM calls should not pay higher prices to support such prices when, given the significant growth of wireless data revenues MNOs will make a return considerably higher than their cost of capital. By contrast, operators like Macquarie face a range of additional costs in the migration to the NBN regime for which there are few ways to increase revenues; and
- Handset subsidies. Again, decisions on handset subsidies are competitive issues for the MNOs and may be driven by for example, network quality issues.[21] Given the high current penetration of mobile services in Australia,[22] cross subsidies from FTM voice calls to handsets (and other devices which have already fallen substantially in real terms), would not seem to consistent with sector policy. In fact the opposite may be true as older Australians who typically use the fixed network proportionally more should not pay higher prices for FTM calls.

Question 25

If a glide path was implemented what would be the appropriate frequency and size of adjustments?

Refer to the response to question 24.

[21] Goldman Sachs, *Telecommunications Services, Mobile Market Dynamics Drive Earnings Changes*, Thematic 10 May 2011

[22] There were some 24.2 million mobile services in operation versus 10.7 million fixed voice services in operation in 2008-09. See ACCC, Telecommunications reports, *op cit*

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Question 26

If a glide path was implemented, should the end point be cost-based, BAK-based or zero?

Refer to the response to question 24. Macquarie is of the view that the end point should be provisionally set at 1 cent per minute on the basis of international benchmarks pending the ACCC's consideration of a pure LRIC based costing model and/or operator actual costs.

Question 27

Are there any circumstances that warrant a difference in the expiry dates of the access determination and the MTAS declaration?

Macquarie agrees with the ACCC's view that the expiry date of the MTAS FAD should be aligned with the MTAS declaration timeframe of 30 June 2014. Macquarie does not foresee circumstances that would warrant a difference in the expiry dates of the access determination and the MTAS declaration.

Question 28

Is the current MTAS service description appropriate and relevant to the continued promotion of the long-term interests of end-users?

Macquarie has no concerns with the current MTAS service description *per se* and does not consider that it should be changed. However, Macquarie is concerned that there is a misalignment between the construct of the ACCC's declared services and the construct of the services provided by access providers and sought by access seekers. In particular, Macquarie seeks and is provided a fixed to mobile service. That is, a service which originates on a fixed network and terminates on a mobile network and is priced as a single service. On the other hand, the ACCC has declared a fixed origination service and has provided a price for that service and has declared MTAS and provided a price for that service. This means that Macquarie does not have a regulated price which matches the service that it actually seeks. Inevitably, because of the imbalances in bargaining strength, Macquarie pays more for a fixed to mobile service than the sum of charges for a fixed originating service and a MTAS.

Question 29

Would there be significant consumer benefits gained from including other mobile termination services in the MTAS service description?

Macquarie does not believe that there are any concerns with the current MTAS service description.

Question 30

Please provide comments regarding the appropriateness of the proposed NPTCs above.

Macquarie supports the ACCC's position that it is minded to include NPTCs into a MTAS FAD which would be based on the ACCC's 2008 Model Terms. Macquarie believes that the provisions in the 2008 Model Terms are important for both access seekers and access providers and should be preserved in the MTAS FAD.

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Question 31

Should the ACCC include terms and conditions relating to the liability and risk allocation in the FAD? If so, should it apply to all access seekers equally, or should it be restricted to a particular class of access seekers?

Macquarie understands that the provisions which are contained in clause C of the 2008 Model Terms relating to the liability and risk allocation have the effect of limiting the liability of either party to the other. Macquarie believes that such provisions are likely to be of benefit to it *qua* access seeker. Further, it is unlikely that such a provision would be agreed to by an access provider in the context of a bilateral negotiation. Accordingly, Macquarie is of the view that terms and conditions relating to the liability and risk allocation should be included in the MTAS FAD and such provisions should apply to all access seekers.

Question 32

Please provide any comments regarding additional NPTCs the ACCC ought to include in the FAD.

Macquarie does not believe that there are any additional NPTCs which the ACCC ought to include in the MTAS FAD.

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APPENDIX A

SELECTED CASE STUDIES ON MOBILE TERMINATION CHARGES

While in this appendix selected case studies on mobile termination charges are presented, from Macquarie's analysis of the MTRs across a range of the selected countries, it is possible to conclude that:

- The **Australian MTR per minute is very high in absolute terms** as expressed in AUD. Only Chile has higher rates and other developed countries have significantly lower MTRs than those which apply in Australia;
- A **large number of countries have mandated reductions in MTRs in 2010 and 2011** with reductions being phased in to provide a time for industry to adjust out to 2014;
- **For countries that regulate MTRs, most have adopted a glide path in the imposition of the reduction**. A key policy basis for these proposals and changes is the belief that lower MTRs would tend to lead to lower unit prices for most end-users and that the lower retail prices would be associated with higher usage. Most MTRs have been reduced taking into account cost-based models;
- There are **significant variations in the selected countries in terms of the percentage decrease in MTRs, ranging as high as 83 per cent**. Even within the EU member states, there is a big variation in the MTRs and the percentage decrease in MTR ranging from, for example, 38 per cent in Sweden and to as high as almost 83 per cent in the UK;
- **The decrease in MTRs is not dependent on the economic state of development of the country**. For example, the percentage decrease in MTRs in New Zealand and Japan (developed countries) at 52 per cent and 33 per cent respectively are comparable to that of Malaysia[23] and South Africa (emerging markets) at 40 per cent and 55 per cent respectively;[24]
- **Smaller city states like Singapore and Hong Kong[25] have respectively instituted a bill and keep arrangement (meaning zero interconnect rates) or completely deregulated the termination market;** and
- **Some countries particularly the EU have made provision for temporary asymmetric termination rates in the case of late entrants** to compensate for factors such as lack of economies of scale and scope, and differential spectrum allocation with the purpose of fostering competition.[26]

A.1 Europe

Since 2001, many European countries introduced price controls for MTRs, particularly for mobile termination. In 2008, MTRs ranged from €0.02 per minute (in Cyprus) to almost €0.16 per minute (in Bulgaria).

In June 2008, the European Commission ('**EC**') proposed reducing the asymmetries between mobile and fixed termination rates, and between rates in different countries. In May 2009, the EC adopted a

[23] Note that in Malaysia, a review of the current access prices including the MTR is scheduled for later in 2011 and it is expected that mobile operators will be arguing for an increase in the current MYR0.05 per minute MTR.

[24] The extent to which a mobile operator may argue for any increase is likely to depend on its market share, the degree to which MTRs are asymmetric (between fixed and mobile operators and between different mobile operators), as well as the asymmetry in its traffic patterns (total minutes of calls initiated by its customers to, compared with the number they receive from other networks).

[25] OFTA has adopted the market driven approach and deregulated the interconnection regime as it considered that market forces and minimum Government intervention bring greatest benefit to the community by enhancing competition and efficiency while keeping costs and prices down.

[26] Other examples, include South Africa where the new operator 8ta has been provide with a higher interconnection rate and some Gulf Co-operation Council ('GCC') markets.

recommendation on the regulatory treatment of fixed and mobile termination rates throughout the European Union ('**EU**').

The recommendation *inter alia* set out the principles for national regulatory authorities to adopt when setting fixed or mobile termination rates. In particular, by 31 December 2012:

- National regulatory authorities should set fixed termination rates and MTRs based on costs incurred by an efficient operator;
- Fixed termination rates and MTRs should be asymmetric; and
- The evaluation of efficient costs should be based on current costs and the use of a bottom-up, "pure" LRIC model.

According to the EU Commission, this would lead to very significant cuts in MTRs across the EU of between €0.015 cents and €0.03 cents per minute by 2012.

It is important to note that the approaches used to regulate fixed and mobile termination rates in the member states are different, which has resulted in differential rates in MTRs and fixed termination rates. For example, the average mobile termination rate is more than five times higher than the average fixed termination rate in Europe. For fixed termination rates, about 70 per cent of the countries adopt a cost-orientation principle (e.g., LRIC or FDC cost models) to set fixed termination rates). In contrast, for MTRs, less than 30 per cent of the countries adopt cost models to determine the MTRs. More than half of the countries use either benchmarking alone or a combination of benchmarking and cost modeling.

The EC maintained that differences in MTRs and fixed termination rates were *driven by the national regulator authorities' inconsistent regulatory approaches* rather than variations in underlying costs, networks or national characteristics. As such, the EC considers that eliminating price distortions across the EU would lower consumer prices for voice calls and stimulate investment and innovation in the telecommunication sector as a whole.

The developments in selected member states in responding to the EC recommendation are as follows (and show graphically in Exhibit A.1 over):

- In the **United Kingdom**, Ofcom has issued a statement of its decision to reduce MTRs from £0.0418 per minute in 2010/11 to £0.0069 pence per minute by 2014;
- In **Italy**, the changes that will be introduced include revising in 2010 the value applicable in the year 2011-2012 on the basis of the LRIC model, lowering the 2011 rates to €0.053 for the three incumbents and €0.063 cents for the later entrant and implementation of full symmetry of MTRs at the level of €0.045 cents by 2012;
- In **Germany**, the regulator has announced the final approval for MTRs to be applied retroactively from 1 December 2010 for a fixed period until 30 November 2012 as follows (i) €0.0338 per minute for Telekom Deutschland GmbH (ii) €0.0336 per minute for Vodafone D2 GmbH, E-Plus Mobilfunk GmbH & Co KG (iii) €0.0339 per minute for Telefonica O2 Germany GmbH & Co OHG;
- In **Sweden**, the regulator has proposed continuation of rules to ensure that mobile operators accept voice calls from other operators and maintain cost-oriented prices. New operators that did not previously have obligations have been added;
- In **Belgium**, the regulator, BIPT, has announced a landmark decision to reduce wholesale MTRs to €0.0108 per minute for all operators in 2013; and
- In **France**, ARCEP has notified the European Commission and submitted to public consultation its draft decision on mobile termination rate for Orange France, SFR and Bougyes Telecom for the period from 1 July 2011 to 31 December 2013. ARCEP is proposing an incremental decrease over the next 18 months towards the target ceiling tariff of €0.008 per minute for 1 January 2013. The first decrease in mobile termination rate will be to €0.02 per minute starting on 1 July 2011 for six months, a second decrease to €0.015 per minute starting on 1 January 2012 for six months and a third decrease to €0.01 per minute starting on 1 July 2012 for six months.

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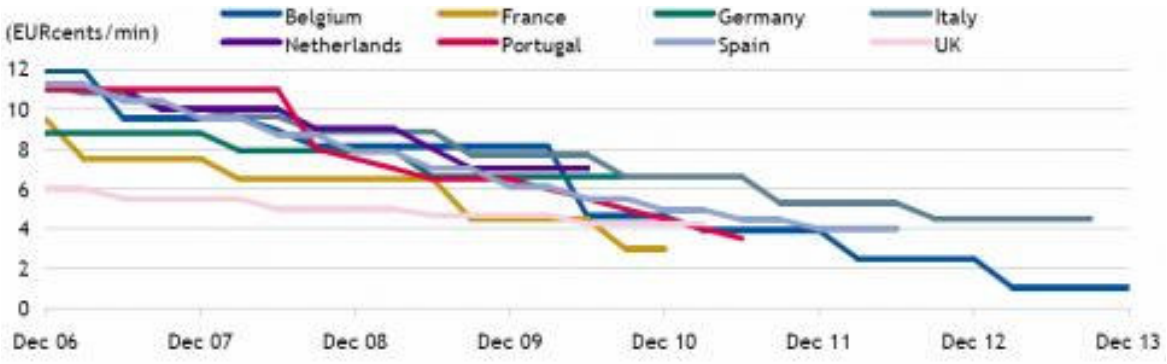
Exhibit A.1: MTRs of leading European operators



Source: Fitch, *European Telecoms - Mobile Termination Rates are a Drag*, 30 March 2010. NB. Average MTRs for two leading operators in each country

A.2 India

When TRAI, the Indian regulator first imposed Interconnection Usage Charge Regulations in 2003, it entailed a transition from a Receiving Party Pays ('**RPP**') regime to a Calling Party Pays ('**CPP**') regime. At this time, TRAI decided to impose common termination charges for fixed-to-mobile and mobile-to-mobile calls for the following reasons:

- Implementation of the regime would be simplified; and
- A common termination charge would facilitate the convergence of fixed-to-mobile and mobile-to-mobile prices, avoiding the imposition of cost items on certain types of calls on account of regulatory policy.

Given the lack of available cost and traffic information with regard to SMS, IN, paging and Internet, TRAI decided to maintain a forbearance policy for these services, leaving service providers to contract under mutually agreed arrangements.

Considering the issue of termination charges in its 2008 Interconnection review, the regulator made the following observations in relation to CPP tariffs and termination charges:

- When selecting a network, mobile subscribers may not take into account the price of fixed-to-mobile calls, as they are not required to pay for them; and
- CPP tariffs and termination charges are under pressure from market forces, as users continue to substitute mobile-to-mobile calls for fixed-to-mobile calls. This creates pressure on mobile operators to reduce fixed-to-mobile rates and mobile termination charges.

In March 2009, TRAI announced the results of the latest review, and reduced domestic termination rates (fixed-to-fixed, fixed-to-mobile and mobile-to-mobile) from Rs 0.30 to Rs 0.20 per minute.

Incumbent GSM operators had argued against a reduction, claiming that the existing termination charges were already below the average national termination charge using an international cost-based methodology. Further, according to their submissions, any further decrease in termination rates would negatively affect the expansion of rural coverage. RCOM had argued for asymmetric termination rates based on the results of a third-party LRIC study. The proposed rates were Rs 0.22 for new operators and Rs 0.08 for incumbent operators.

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A.3 New Zealand

In 2007, New Zealand's Commerce Commission recommended the regulation of mobile termination. This was rejected by the Minister of Economic Development in favour of binding commitments by Telecom NZ and Vodafone NZ, which undertook to reduce their fixed-mobile termination rates over five years from NZD 20 cents to NZD 12 cents and NZD 14 cents respectively.

In February 2010, the Commerce Commission favoured the retention of these undertakings, which had since been extended to reduce fixed-to-mobile and mobile-to-mobile termination rates on both networks to NZD 6 cents by 2014, as opposed to making mobile termination services a designated access service.[27]

However, in June 2010, the Commission released a "Reconsideration Report" reversing its position reached just months earlier. In the interim, Vodafone had introduced, and subsequently withdrawn, a prepaid add-on plan offering low rate on-net calling to an unlimited number of Vodafone mobiles as well as mobile calls to any fixed line. The Commission considered that this plan demonstrated the ability of incumbents to limit the competitive constraints placed on them by new entrants, as well as potentially affecting retail market penetration.

The concern of the Commission arose primarily from *"the relationship between the wholesale MTR and the retail on-net price, and the extent to which the combination of low retail on-net prices and above-cost wholesale MTRs creates or maintains a barrier to efficient expansion by a new entrant."* When combined with the particular set of circumstances in New Zealand, where over 80 per cent of voice traffic and 90 per cent of SMS traffic are carried on-net, the Commerce Commission saw fit to recommend a regulatory change. Following the release of the Commission's Reconsideration Report, the Minister announced a consultation process.

In May 2011, the Commission released the *Standard Terms Determination for the designated services of the mobile termination access services (MTAS) fixed-to-mobile voice (FTM), mobile-to-mobile voice (MTM) and short messaging services (SMS)*. The Commission decided *inter alia* that the MTRs will drop to less than 4 cents by 1 April 2012, with further reductions until 2014 while termination rates for text messages will drop to 0.06 NZ cents from 6 May 2011. The schedule for wholesale MTR are as follows (i) 6 May 2011: 7.48 c/min (ii) 1 October 2011 5.88 c/min (iii) 1 April 2012: 3.97 c/min (iv) 1 April 2013 3.72 c/min (v) 1 April 2014 3.56 c/min.

A.4 United Kingdom

In May 2009, the UK communications regulator Ofcom issued a consultation on the different approaches to regulating MTR including possible reforms. In the second consultation published on 1 April 2010, Ofcom provided explanation on why it thought that capping MTRs, based on some measures of cost, would lead to better outcomes for customers than alternative approaches. Ofcom proposed to cap MTRs based on the incremental cost of terminating a call (pure LRIC) and set maximum charges reaching a level set to pure LRIC over four years. Ofcom's view was that adopting pure LRIC would be more likely to promote efficiency, sustainable competition and would confer the greatest possible benefit on consumers.

[27] The Commerce Commission initially defined the scope of the Mobile Termination Access Services (MTAS) to include both fixed-to-mobile and mobile-to-mobile calls in its 2008 paper *"Reasons for Commerce Commission decision to investigate mobile termination access services"*. The reasoning behind this decision was that the MTAS are inputs into the supply of downstream retail calls and do not distinguish where these calls came from.

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In March 2011, the Ofcom issued a statement which set out its decision to adopt a charge control for the four national mobile communications providers ('**MCP**') based on pure LRIC. This approach will lead to MTRs falling from around 4.18 pence per min in 2010/11 to 0.69 pence per min by 1 April 2014. In the statement Ofcom *inter alia*:

- Identified each market for a relevant MCP as the provision of services to other communications providers for the termination of voice call to UK mobile numbers which that MCP has been allocated by Ofcom, in the area served by that MCP and for which the MCP is able to set the MTR;
- Designated each of those 32 MCPs as having significant market power with respect to the termination of calls to that network;
- Required all 32 MCPs to provide MCT on fair and reasonable terms;
- Required the four national MCPs not to unduly discriminate in relation to provision of MCT; and
- Limited MTRs for all four national MCPs so that the maximum permitted charge for MCT reaches pure LRIC by 1 April 2014.[28]

[28] The MTR cap will be set on a four year glide path and aims to limit disruptive price setting flexibility by setting a simple cap with a single maximum charge in each year after a 2 month transition period.

APPENDIX B

MOBILE TERMINATION RATES AND DEVELOPMENTS IN SELECTED COUNTRIES

Country	Method of Price Setting	Method of Calculating Prices	Previous MTR (per min)	Current MTR (per min)	Final MTR (per min)	Final MTR in AUD (per min)	Comments / Developments
Australia	Constant	LRIC	AUD0.09	AUD0.09 [29]	N/A	0.09	• Fixed to mobile termination rates are not treated any differently from mobile to mobile termination rates. • Currently, the Mobile termination access service ('MTAS') is a declared service and the ACCC has made an access determination setting price and non-price terms. • MTAS was declared in 2004 on the basis that regulating MTRs would promote competition, ensure any-to-any connectivity and encourage economically efficient investment in mobile network infrastructure • The ACCC issued a MTAS pricing principles determination in 2009 which set out indicative prices for MTAS for 2009 - 2011 • Operators are not required to publish standard interconnection agreements or prices.
Belgium	Glide Path	EU Costing model – pure LRIC	Proximus €0.0720; Mobistar €0.0902 Base €0.1143	Proximus €0.0452; Mobistar €0.0494; Base €0.0568	€0.0108 (all) *(2013)*	0.0143	• On 3 February 2010, the Belgian regulator (the BIPT) announced a landmark decision to reduce wholesale MTRs from August 2010 to 2013. Costing was based on EU pure LRIC model • The mobile network operators appealed to the Brussels Court of Appeal against the proposed reductions but this was dismissed in February 2011.
Brazil	Glide Path	Historic costs	USD0.20	USD0.20	USD0.09 *(2015)*	0.0830	• Regulator, Anatel has prepared a proposal in late 2010 on reducing MTRs by at least 55% over the next five years. • Brazil, which has asymmetric MTRs will require its larger telcos: Vivo, Oi, Brasil Telecom and Claro to commit to an additional 10% reduction over the next five years (75% in

[29] From 1 January 2009 – 31 December 2011

Country	Method of Price Setting	Method of Calculating Prices	Previous MTR (per min)	Current MTR (per min)	Final MTR (per min)	Final MTR in AUD (per min)	Comments / Developments
							total).
Chile	Glide Path	Unknown	77.98 pesos	77.26 pesos[30]	76.42 pesos *(2009)*	0.1524	• Access charge is established by the regulator. • Applicable from 2004 to 2009 pursuant to Government decree, starting at 77.98 pesos with an average fall of 0.5% per year for five years, ending at 76.42 pesos in 2009.
France	Glide Path	LRIC	€4.5 cents, €6 cents	€2 cents	€0.8 cents *(2013)*	0.0106	• ARCEP conducted a public consultation from 22 December 2010 to 31 January 2011 on the technical economic model for a mobile network in Metropolitan France. • ARCEP has notified the EC and is proposing a decrease in MTR in 3 stages starting from 1 July 2011 to target date of 1 January 2013
Germany	Step down	LRIC	€0.0656, €0.0714	€0.0336, €0.0338, €0.0339	€0.0336, €0.0338, €0.0339 *(2012)*	0.0445	• In February 2011, the regulator announced its approval for MTRs to be applied retroactively from 1 December 2010 for a fixed period until 30 November 2012
Hong Kong	Not regulated	Not regulated	HKD0.05 45	Not Regulated	Not Regulated	Not Known	• Following a review of the termination framework as part of an assessment of fixed-mobile convergence in 2006, OFTA completely deregulated mobile termination over a 2-year transition period culminating in the withdrawal of the mobile party network pays arrangement on 27 April 2009 • From April 2009, previous regulation on interconnection charges for MTRs ceased to be effective. Interconnection charges are now commercially negotiated.
Indonesia	Set bi-annually by DGPT	Cost based	IDR 261	IDR 251	N/A	0.0272	• Termination rates are regulated • The last review on interconnection rates was carried out in February 2008, with 40% reduction in MTRs
Israel	Glide Path	Cost based	ILS 0.254	ILS 0.0687	ILS 0.0555 *(2014)*	0.0151	• In May 2010, the Government proposed a significant reduction in interconnection charges.

[30] Applicable from 2004 to 2009 pursuant to government decree, starting at 77.98 pesos with a an average fall of 0.5% per year for five years, ending at 76.42 pesos in 2009.

Country	Method of Price Setting	Method of Calculating Prices	Previous MTR (per min)	Current MTR (per min)	Final MTR (per min)	Final MTR in AUD (per min)	Comments / Developments
							• This was modified by the Ministry in September 2010 with a plan to mandate the reduction of voice interconnection fees by over 70% and SMS rates by approximately 96% from 2011-2014.
Italy	Glide Path	Bottom up LRIC	€0.0936 (Oct 2008)	€0.053	€0.045 *(2012)*	0.0596	• In December 2008 AGCOM adopted a 3-year glide path for MTRs from 2009 to 2011 to address existing asymmetry. • EU Commission considered initial price caps for 2011 proposed by AGCOM were too high compared to other EU Member States, and invited AGCOM to develop a cost model whereby the MTRs should be reduced to the cost level of an efficient operator employing efficient technology with a view to eventually arriving at a symmetric rate by 2012. • AGCOM's final decision lowered the MTRs for 2011 to €0.053 and €0.063 for the later entrant. But AGCOM again lowered the rates in 2010 for 2011-2012 on the basis of a "bottom- up long-run incremental cost" model • Currently, AGCOM's plan envisages € 0.045 per min in 2012 (with full symmetry among the 4 mobile operators) but, according to the press reports, this may cut to €0.033 per min in the future.
Japan	Annual Step downs	Cost based	JPY8.1 (2009)	JPY5.22 for NTT Docomo	JPY5.22 *(2011)*	0.0615	• Telecommunications carriers with Category I and II designated telecommunications facilities are obliged to publicise their interconnection tariffs including termination rates (which are cost efficient). • Termination rates are principally determined through negotiations between carriers. • On 24 January 2011, NTT DOCOMO advised the Ministry of Internal Affairs and Communications of its reductions in MTRs for local and long distance calls based on the guideline announced by the Ministry in March 2010. The rates were backdated to 1 April 2010. This followed a 15.6 per cent reduction in MTRs in the previous year which was backdated

Country	Method of Price Setting	Method of Calculating Prices	Previous MTR (per min)	Current MTR (per min)	Final MTR (per min)	Final MTR in AUD (per min)	Comments / Developments
							to 1 April 2009.
Malaysia	One off Step down	Ministerial Set Price	MYR0.08 36	MYR0.05	MYR0.05 *(2011)*	0.0155	• New rates set by Ministerial intervention effective from 15 July 2010
Mexico	Industry agreed glide path	Cost based	MXN1.21 (2009)	MXN0.95	MXN0.69 *(2014)*	0.0546	• Telefonos de Mexico, and Radiomovil Dipsa, signed agreements with Telefonica Moviles Mexico, to reduce interconnection rates. The two America Movil subsidiaries agreed with Telefonica to cut interconnect fees between domestic fixed and cellular networks to MXN 0.95 as from January 2011, MXN 0.86 in 2012, MXN 0.78 in 2013 and MXN 0.69 in 2014. • Such reductions were insufficient for the smaller fixed network operator Alestra who sought and obtained a decision on 16 March 2011 from Cofetel (Mexican regulator) setting the rate at MXN0.39. This matter is currently being litigated.
New Zealand	Glide Path	Cost based	-	NZD0.074 8	NZD0.035 6 *(2014)*	0.0283	• In May 2011, the Commerce Commission proposed, *inter alia,* that the MTRs will drop to less than 4 cents by 1 April 2012, with further reductions until 2014
Norway	Glide Path		NOK 0.60	NOK 0.30	NOK 0.17 *(2013)*	0.0289	• Norway follows an asymmetric pricing system. In 2009, the Regulator required Telenor and Netcom, two of the nation's largest providers, to reduce termination rates to a greater extent than competitors. • In March 2010, the NPT proposed a draft decision on the three year regulation of MTRs, ending in 2013. By 31 December 2013, all providers will charge a symmetric rate of NOK 0.17.
Pakistan	Glide Path	Cost based	Rs 1.3	Rs 0.9	Rs 0.9 *(2008)*	0.0096	○ "The Determination on Cost-based Interconnection Charges for Fixed Line and Mobile Operators" dated 14 May 2008 set the interconnection charges for fixed and mobile operators. It resulted in a 30% reduction.

Country	Method of Price Setting	Method of Calculating Prices	Previous MTR (per min)	Current MTR (per min)	Final MTR (per min)	Final MTR in AUD (per min)	Comments / Developments
Phili-ppines	Glide Path	TSLRIC	PP 6, PP 4	PHP 4.0 [31]	PP 1.5 *(2012)*	0.0326	• The circular on "Implementing Guidelines on Developing Reference Access Offers" 2009 requires all cost oriented access charges with 3 year transition period to benchmarking interconnection charges using the principles of TSLRIC plus. • In practice, interconnection rates are mutually negotiated although the Government would like to impose ceiling rates. • In 2010 the NTC announced plans to bring down charges for voice and SMS. This represents a shift from the previous price setting approach.
Singapore	BAK	Not relevant	0	0	0	N/A	• For fixed-mobile and mobile-mobile calls Singapore has a Bill and Keep (BAK) arrangement with no provisions for compensation of traffic imbalances. • For fixed-fixed and mobile-fixed calls a low cost-based termination rate (SGD0.0084) applies to all traffic that terminates on incumbent fixed networks • Dominant licensees are required to obtain IDA's approval for charges for IDA specified interconnection and/or network access.
South Africa	Glide Path	Cost based with Ministerial intervention	ZAR0.89	ZAR0.73	ZAR0.40 *(2012)*	0.0545	• In April 2010, the Regulator, ICASA, announced a three-year glide path on MTRs for, *inter alia*, mobile services.
Sweden	Glide Path	LRIC	SEK 0.32	SEK 0.265	SEK 0.19 *(2014)*	0.0277	• In 2008, the Regulator decided that TeliaSonera was to reduce rates under a six year glide path by 80%. • The LRIC method was reportedly revised in 2010.
United Kingdom	Glide Path	LRIC	£0.04	£0.0418 for 4 major operators, £0.0448	£0.0069 pence *(2015)*	0.0104	• In March 2011 Ofcom announced a significant reduction in MTRs. From 1 April to 2011 to 1 April 2015 operators 3UK, O2, Everything Everywhere and Vodafone will face caps on chargeable rates. '

[31] However, as per draft circular 2009 on Interconnection Charge for mobile voice service, this was to be reduced to not higher than PHP 1.5.

Country	Method of Price Setting	Method of Calculating Prices	Previous MTR (per min)	Current MTR (per min)	Final MTR (per min)	Final MTR in AUD (per min)	Comments / Developments
				for H3G			• This will lead to an 80% reduction in termination rates over the next four years • By 2014/15 there will be a uniform cap of 0.69 pence per minute • Mobile operators were unhappy with this move and have taken Ofcom to the Competition Appeals Tribunal (except 3UK which supports the decision taken by Ofcom).

Source: Windsor Place Consulting Analysis, July 2011

APPENDIX C

WIRELESS TECHNOLOGY INNOVATIONS ARE FURTHER AFFECTING MOBILE TERMINATION COSTS

C.1 Overview

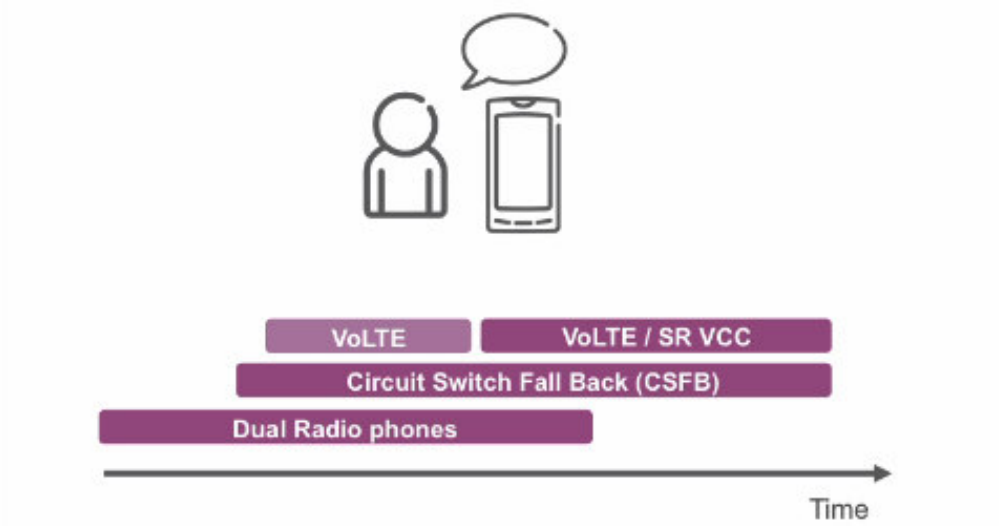
Macquarie would like to highlight to the ACCC that there are a number of wireless technology innovations which are having a material impact on the cost of mobile termination going forward. In this appendix three of those innovations which are reducing termination costs, are highlighted namely: (i) voice over LTE ('**VoLTE**'), (ii) Wi-Fi offloading and (iii) deployment of femtocells. Such cost factors should be considered by the ACCC.

C.2 VoLTE

Macquarie understands that VoLTE should be widely available globally in 2012, following the first commercial calls on the Verizon network in February 2011. Given Telstra's deployment of LTE over its 1800 MHz spectrum and announcements from SingTel Optus and VHA that they will also be deploying LTE networks in the same spectrum it is likely that sometime in 2012, Australian mobile network operators will offer VoLTE. VoLTE is also likely to be deployed on networks which utilise the 700 MHz digital dividend spectrum.

While the current approach is use dual radio phones which utilise the 2G networks in the mobile phone for all voice calls, from 2012 voice calls will be provided over LTE with circuit switch fall back ('**CSFB**') back to the 2G networks where necessary (e.g., no coverage). Ultimately the approach likely to be adopted by MNOs will be to adopt Single Radio Voice Call Continuity ('**SR VCC**') for VoLTE, which uses an IP Multimedia Subsystem ('**IMS**') system for call anchoring and handover and is based on a third party call control mechanism. This allows a mobile phone with an ongoing voice call to transition to the circuit-switch domain in the event of loss of LTE coverage. The options for voice calling on LTE networks are detailed in Exhibit C.1 below.

Exhibit C.1: Options for Addressing Voice on LTE



Source: *Informa Telecoms & Media* and *Ericsson*, *LTE Early Launch Strategies: Who and Why? Webinar*, 21 June 2011

Similar to the termination of voice calls in 3G networks which are cheaper than the termination of voice calls on 2G networks, it is expected that the termination of voice calls on LTE and further 4G

networks (e.g., LTE-A) will even be cheaper as the cost of terminating a voice call as part of an broadband IP stream will be low.

C.3 Wi-Fi off-loading

C.3.1 Overview

Globally, with the exponential growth in wireless data and broadband services MNOs are rapidly adopting network offloading techniques. These include Wi-Fi offloading, Femtocell deployment, smart repeaters, and distributed antenna systems.[32] Offload can be defined as utilising complementary technologies for delivering data originally targeted for 2G, 3G and future 4G networks.

MNOs support network offloading as an essential component of their strategies because it (i) alleviates capacity constraints and (ii) reducing their spectrum costs. Specifically, the ability to utilise unlicensed (and hence free) spectrum to support those small number of cell sites/locations which face congestion has commercial merit (and need to be factored in for any cost assessment).

Wi-Fi technologies[33] which were ubiquitous in computing, has been utilised extensively in urban environments where typically the demand is the greatest. More specifically the proliferation of smartphones and tablet computers with built in Wi-Fi is driving the demand for, and therefore the expansion of, public Wi-Fi networks.

C.3.2 Types of Wi-FI offloading

There are three types of Wi-Fi off-loading (see Exhibit C.2 over) depending on the degree of coupling between the MNO and Wi-Fi networks, namely:

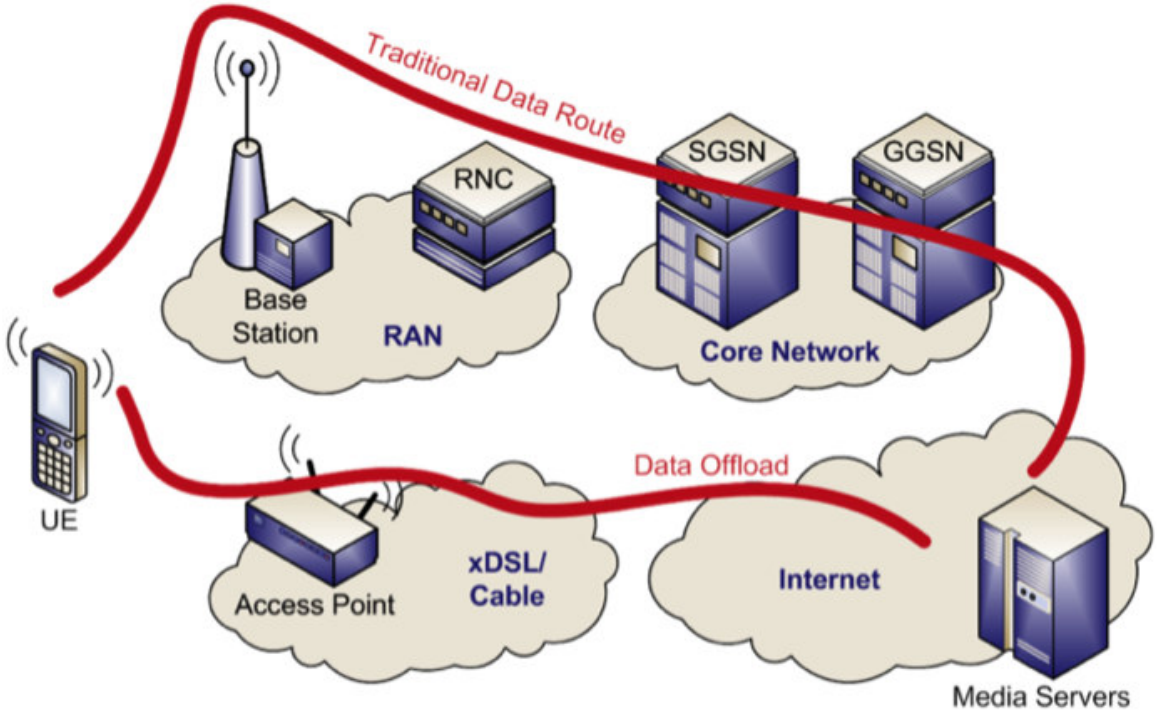
- **Tight coupling**. This utilises 3GPP Enhanced Generic Access Network ('**EGAN**') architecture as it specifies rerouting of cellular network signaling through Wi-Fi access networks. This makes the Wi-Fi access network as a de-facto 3GPP RAN. This technology is better known as Unlicensed Mobile Access ('**UMA**'). In the beginning, it was targeted to improve indoor coverage for the voice service in 2G networks. In 3GPP later releases GAN architecture was extended to cover also 3G packet data protocols, and hence is now referred to as EGAN architecture;[34]
- **Loose coupling**. 3GPP has also specified an alternative approach called Interworking Wireless LAN ('**IWLAN**') architecture and it is a solution to transfer IP data between a mobile device and operator's core network through a Wi-Fi access. In the IWLAN architecture, a mobile device opens a VPN/IPsec tunnel from the device to the dedicated IWLAN server in the operator's core network to provide the user either an access to the operator's walled-garden services or to a gateway to the public Internet. With loose coupling between the networks the only integration and interworking point is the common authentication architecture. Currently, it is not possible to initiate a call on a Wi-Fi network and continue the call on a 3G network; and
- **No Coupling**. This is the most straightforward way to offload data to the Wi-Fi networks. It results in there being a direct connection to the public Internet. It means that there is no need for interworking standardisation. For mere web access there is no added value to route the data through the mobile operator's RAN and core network.

[32]For the purposes of this paper Macquarie do not assess another data offload technique/technology known as Integrated Mobile Broadcast ('iMB'). iMB which a mobile wireless technology that enables broadcast of content has not been broadly embraced and may not be utilised in Australia.

[33]Wi-Fi is the marketing-friendly term for the 802.11 family of wireless networking standards. It got its start with 802.11b with a data-transfer speed of 11 Mbps. Next came 802.11g at 54Mbps, then the present fastest standard, 802.11n has a top speed of 450Mbps.

[34] There are six operators utilising the technology globally – Orange (UK), Orange (France), Rogers (Canada), TeliaSonera, Cincinnati Bell (United States) and T-Mobile (United States). The handsets with UMA access can be found at www.smart-wi-fi.com/smartphones.php . There is also debate in the US that AT&T will also be adopted the T-Mobile Wi-Fi calling.

Exhibit C.2: Wi-Fi offloading (referred to as HNB-GW) implementation



Source: Coleago, 2010

Many operators report that around 20 per cent of data traffic is being offloaded in congested public locations while Asian operators like Korea Telecom and PCCW claim that they offload 60 and 80 per cent of mobile data traffic to Wi-Fi, respectively.[35] As a consequence, these operators are increasingly bundling public Wi-Fi access into smartphone tariff plans. Wi-Fi offloading is attractive financially as case studies done for foreign operators would suggest that effective offload would reduce total traffic in the order of 25 per cent per annum by 2015. It typically has a lower total cost of ownership versus leading wholesale capacity. It does, however, need to be actively managed in order to be effective.

C.3.3 Future developments

While Wi-Fi is being deployed, it is still in its evolution phase and technological developments are ensuring that it will play a key role in future offloading solutions. Several enabling features are development phases, namely (see also Exhibit C.3 below):

(i) ***Secure Authentication***: This authentication is inbuilt into SIM cards and will mean that subscribers are granted exclusive access to their operator's Wi-Fi;

(ii) ***Wi-Fi Handover***: This will enable the seamless transition between different Wi-Fi cells; and

(iii) ***3G/4G Handover***: This is a key development area and is being actively pursued. It will enable the automatic transfer of devices from 3G/4G networks to Wi-Fi.

The introduction of these enhancements will have substantial effects on the utility and versatility of Wi-Fi as a means of alleviating capacity constraints. It will also add to the commercial appeal of this product.

[35] Informa, *Learning from the Femtocell and Wi-Fi Pioneers: Best practice in operator go-to- market strategy, Webinar*, 18 May 2011

Public

Exhibit C.3: Future Wi-Fi Developments

Integrated Off-loading[36]

Three of the four largest U.S. mobile operators (namely AT&T, T-Mobile and Sprint) are testing technology from startup WeFi (see www.wefi.com) that lets them point subscribers' smartphones to private and public Wi-Fi networks whenever practical. If the US operators formally adopt the program, consumers should see a change in the way their handsets navigate networks. That, in turn, should translate into savings in the number of downloads consumers use and hence costs.

The system announced in March 2011 is called WeANDSF – a name which combines WeFi's name with the words Access Network Discovery and Selection Function. It consists of three parts: (i) a software client for consumers' phones, (ii) a global database of Wi-Fi networks and (iii) a control panel that operators can use to specify how, when and where devices on their networks should connect to outside Wi-Fi. WeFi is also shopping the WeANDSF system to operators outside the US. Deutsche Telekom is currently trialing it and East Asian operators have also expressed interest in the technology.

Wi-Fi Developments

Going forward there are also developments in Wi-Fi technology. These are principally driven the Wireless Gigabit Alliance (WIGig).[37] WiGig Alliance has developed a unified specification for 60 GHz wireless technologies that will provide multi-gigabit wireless connectivity among PCs, consumer electronics and handheld devices. Two new versions of Wi-Fi are under development namely 802.11ac (at 1 Gbps) and 802.11ad (at 7 Gbps).

C.3.4 Conclusions

The current utilization of Wi-Fi off-loading in Australia and its likely increased future use, would suggest that in certain scenarios where Wi-FI is used for voice termination the cost is likely to be significantly reduced as the number of mobile network elements is significantly reduced. If a large proportion of calls are transported and terminated in this manner then such factors should be taken into account in the ACCC's cost modeling.

[36] Adopted from Forbes. http://blogs.forbes.com/elizabethwoyke/2011/04/22/automatic-wi-fi-offloading-coming-to-u-s-carriers/

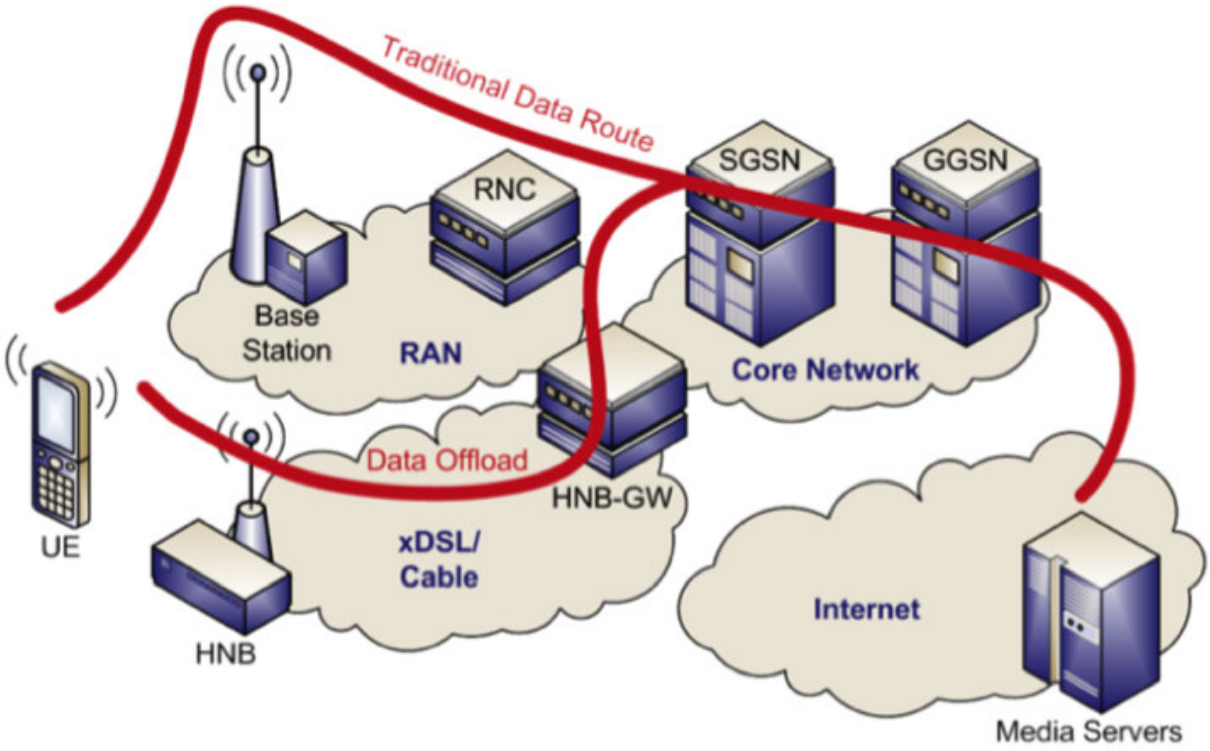
[37] See www.wirelessgigabitalliance.org

C.4 Deployment of Femtocells

C.4.1 Overview

Femtocells are low-power wireless access points (a home Node B) that operate using licensed spectrum to connect standard mobile devices to a MNO's network using xDSL, fibre or cable broadband connections (as depicted in Exhibit C.4 below). Femtocells can utilize the NBN connectivity in the future. Femtocells also form the first part of the new self-organising network ('**SON**') and transform the potential of small cells by providing a practical preview of core LTE functionality.

Exhibit C.4: Femtocell (referred to as HNB-GW) implementation



Source: Coleago, 2010

Currently, according to industry commentators, Informa, as at the end of March 2011, 20 mobile operators have already deployed femtocells in their networks and 34 operators have committed to their launch.[38] These include SingTel Optus and VHA (but not Telstra at this stage) as detailed in Exhibit C.5 below.

[38]Informa, *Learning from the Femtocell and Wi-Fi Pioneers: Best practice in operator go-to- market strategy, Webinar*, 18 May 2011

Public

Exhibit C.5: Femtocells in Australia

SingTel Optus becomes the first mobile operator in Australia to offer femtocells with the launch of a commercial pilot, in April 2011.

The product, branded Optus 3G Home Zone, is being promoted as offering improved in-building coverage. According to Optus, it will allow four simultaneous users to reliably make and receive calls and access 3G data services within a 30 metre radius. A web portal enables owners to add and remove the mobile numbers of family friends and visitors to whom they want to give access. A total of 12 can be nominated. However, all must be Optus mobile customers. Prices for the device range from AUD60 for those on AUD79 per month plans or higher to AUD240 for prepaid customers. Contract customers can also spread their payment over 12 months.

The device does not require an Optus broadband service but using it for 20 two minute calls per day would use about 1GB per month. Optus also says that, in addition to volume related data, the femtocell will impose a 'base load' on the broadband connection of about 1GB per month. Optus suggests that at a minimum the broadband service should deliver 1Mbps downstream and 256kbps upstream and says that, if upstream bandwidth falls below 128kbps, the device will stop working.

VHA in May 2011 has quietly launched its own femtocell product aimed at boosting 3G coverage indoors, but has limited the release to select business customers. It has begun rolling out femtocell services under the name of Vodafone Expand to selected business customers whose offices reside within the company's WCDMA 2100MHz spectrum footprint.

VHA is offering two devices: a small expander and a large expander that will allow businesses to offload their mobile phone call and data traffic from the VHA network onto the customer's own fixed-line broadband service in areas where there may be difficulty getting coverage, particularly inside the building. The smaller device is designed for between 10 and 20 users and is capable of handling up to four connections at once, while the larger device is for between 40 and 80 users and can handle up to 16 connections simultaneously. These femtocell devices are different to the Sure Signal products offered by Vodafone in the UK and New Zealand.

C.4.2 Conclusions

Similar to comments made by Macquarie in relation to Wi-Fi off-loading, should the deployment of femtocells accelerate (perhaps facilitated by the NBN) then a growing proportion of voice calls terminating on mobile numbers will in fact be terminated utilising fixed network rather than mobile network infrastructure. Again, Macquarie considers that such factors should be taken into account in the ACCC's cost modeling. Such termination combined with the growing economies of scale and scope on the mobile networks would suggest that mobile termination costs should be similar or equal to fixed network termination costs.