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FINAL REPORT

The Use of Benchmarking in Regulating Mobile Termination Rates

Submitted to

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1. EXECUTIVE SUMMARY

In March 2004, the ACCC ('the Commission') released its Draft Decision, *Mobile services review – Mobile terminating access service* that proposes to regulate mobile termination services on the basis of international benchmarks.

This report reviews the use of benchmarking approaches in mobile termination regulation. Benchmarking provides one means of gaining an indication of the efficient level of mobile termination charges for Australian operators. However, benchmarking will only be useful in this regard if there are either:

- Sufficiently close comparators, such as efficient prices for countries in which termination is supplied under similar supply conditions; or
- If such close comparators do not exist, reasonable means of adjusting the chosen comparators for differences in supply conditions.

The Draft Decision refers to four sources of information on the cost of providing mobile termination services and notes that the estimates "range from 5-6 cents per minute to around 12 cents per minute (cpm)."^{1,2} The Commission's sources of information are:

- Cost estimates for the UK in 2001 and three of the four most populous states of the US;
- The Commission's own analysis of Telstra's costs;
- Retail prices for on-net mobile calls; and
- Information reviewed in its 2001 report which includes:
 - Modelling by an Australian carrier of some of the network costs incurred in supplying mobile services;
 - Modelling undertaken by the UK Monopolies & Mergers Commission in 1998 that estimated a price for the UK operators of around 31cpm

¹ Draft Decision, p. 167. We note that the sources of information referenced by the Commission also include estimates around 18-21cpm and 26-31cpm.

² Throughout this report, the exchange rates reported by the Reserve Bank of Australia on 20 May 2004 have been used (i.e. a \$A/£ rate of 0.3902, a \$A/\$US rate of 0.6924 and a \$A/€ rate of 0.5794). These were the latest exchange rates at the time of the analysis and thus provided the best estimate of future exchange rates. All cpm figures are in Australian cents per minute.

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(12.15 pence per minute) in 1998/99, falling to 26cpm (9.98ppm) in 2001/02 with increases in traffic;³ and

- Modelling undertaken by Oftel in 1998 that estimated a TSLRIC of around 18-21cpm (7.0-8.3ppm) in 1998/99.⁴

The Commission does not explain why it has disregarded the two latter estimates from the range reported in its Draft Decision, despite average subscriber numbers for the UK operators in 1998/99 being similar to average subscriber number for the Australian operators in 2003.⁵

International benchmarking

While the Commission has sought to rely on international benchmarking to help set its target price for termination, there is no indication that the Commission has considered the likely impact of the differences in supply conditions between the comparators chosen by the Commission and Australia.⁶ As will be discussed in this report, the impact of differences in key cost drivers suggests that the costs of supplying mobile services in Australia is likely to be substantially above the costs of supplying mobile services in the UK and the selected densely populated US States.

Using the UK and US estimates as benchmarks and taking into account differences between Australia, the UK and the US in terms of coverage, traffic volumes, subscriber numbers and labour and land costs, we found that the TSLRIC level of Australia's mobile termination charges may lie in the range **11.5 - 26.8cpm**.

³ Paragraph 1.10 of the MMC's *Cellnet and Vodafone Report* available at: http://www.competition-commission.org.uk/rep_pub/reports/1999/fulltext/421c1.pdf

⁴ See Table 5.3 of the MMC's *Cellnet and Vodafone Report*.

⁵ Average subscriber numbers for UK operators was around 3.7 million in 1998/99 compared with the average for Australian operators in 2003 of around 3.8 million (sources: http://www.ofcom.org.uk/static/archive/oftel/publications/market_info/2003/ami0303.pdf and Australian operators' 2003 Annual Reports). While other factors are likely to also result in cost differences such as Australia's lower teledensity pushing up costs and lower equipment prices in 2003 pushing down costs, The Commission did not offer any reasons why the 1998/99 estimates for the UK should be disregarded in favour of a number seemingly based on the 2003 UK estimates, particularly when the UK market in 2003 with over 50 million subscribers was around 250% larger than the Australian market.

⁶ Indeed, while the Commission has uncritically adopted the benchmarks suggested by a proponent of regulation, it has ignored the discussion of the dangers of simplistic benchmarking exercises presented in the paper, *Regulation of Mobile Call Termination Charges: International Approaches*, (14 August 2003) submitted by CRA to the Commission on behalf of Optus.

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More generally, we do not believe the Commission should adopt international pricing approaches without regard to the impact of those approaches. The US Federal Communications Commission ('FCC') identifies low US mobile termination charges as a key factor in explaining low US mobile penetration rates compared with other countries in which higher termination rates keep down prices to mobile subscribers, particularly marginal customers.⁷ Despite high US incomes, US mobile penetration at around 50 per cent is substantially below the leading European countries with penetration around 90 per cent.⁸

Furthermore, there is evidence that the significant reduction in UK termination rates in July 2003 is pushing up mobile prices to marginal customers. Oftel statistics show:

- A 15 per cent increase in the total cost of mobile packages for low use mobile customers between July 2003 and October 2003;⁹ and
- Overall mobile penetration has fallen between May and August 2003 from 75 per cent to 73 per cent, and mobile penetration amongst households on incomes below £17,500 fell from 64 per cent to 60 per cent.¹⁰

Analysis of operators' costs

The Draft Decision also states that the target price has been determined with reference to the Commission's analysis of Telstra's costs and to modelling submitted by a carrier. While we have had limited opportunity to review these analyses, we note that they do not estimate the incremental costs of terminating a call to a network (which will be higher than the incremental cost of originating a call from a network), nor do they estimate the efficient allocation of fixed and common costs across services, including an allowance for network externalities.

We also have specific concerns with the Commission's analysis being based only on Telstra's costs as Telstra's costs will be below the costs necessarily incurred by the smaller operators. In addition, the modelling submitted by the carrier understates key network costs and ignores other network costs and all non-network costs.

⁷ US FCC, *Eighth Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, para. 209ff (available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-150A1.pdf).

⁸ Ibid. Table 12.

⁹ Oftel, *Mobile Price Monitoring*, October 2003 (available at http://www.ofcom.org.uk/static/archive/oftel/publications/market_info/including.xls).

¹⁰ Oftel's *Consumers' use of mobile telephony Q14 August 2003*, published 27 October 2003 (available at <http://www.ofcom.org.uk/static/archive/oftel/publications/research/2003/q14mobres1003.pdf>). It should also be noted that the full impact of factors such as higher handset prices will only be felt over time, i.e. as existing subscribers need to replace lost, stolen or broken handsets.

Mobile retail benchmarks

The Commission has also used as a guide to its target termination charge, 50 per cent of the retail prices for on-net calls. This analysis ignores that:

- On-net call prices are likely to be significantly below average call costs, reflecting Ramsey pricing considerations and the use of discounted on-net calls as a form of marketing to provide an incentive for existing customers to encourage their frequent callers to join the particular network they are on; and
- The efficient level of termination charges will be more than 50 per cent of average call costs because the incremental costs of terminating a call are greater than the incremental costs of originating a call, and termination should bear a greater contribution to the recovery of fixed and common costs so as to maximize overall consumer welfare.

Our findings

Based on our review and analysis of each of the three main sources of information used by the Commission to identify a target termination charge, *viz.* international benchmarks, the analyses of operators' costs and mobile retail prices, we find that each is likely to significantly understate the efficient level of termination charges in Australia. That said, international benchmarking can provide useful information on the appropriate level of termination charges, *provided differences in supply conditions are taken into account.* Our analysis of the overall impact of key differences in cost factors, including factors that tend to raise as well as lower costs, suggests that the efficient level of mobile termination charges in Australia will be in the range of **11.5 - 26.8cpm.**

The rest of this report is structured as follows:

- Section 2 discusses the use of international benchmarking in mobile termination regulation and assesses the impact of differences between countries in key drivers of the cost of supplying mobile services;
- Section 3 considers the analyses undertaken by the Commission and by another carrier of the costs incurred by the Australian mobile operators; and
- Section 4 considers the use of mobile retail prices to infer the efficient level of termination charges.

2. INTERNATIONAL BENCHMARKING

Benchmarking offers a means by which regulators can gain an indication of the efficient cost of supplying a particular service while avoiding the resource cost and delays associated with larger and complex cost modelling exercises. However, benchmarking will only be useful where either:

- Sufficiently close comparators exist, i.e. there are cost estimates for services provided under conditions similar to those for the service of interest to the regulator; or
- Reasonable adjustments can be made to the comparators to take into account any significant differences in supply conditions.

The use of benchmarking that does not take into account relevant differences in conditions of supply risks imposing large welfare costs, such as would be the case were a regulated price to be set below the efficient cost of supplying a service in a country because of a failure to take into account factors that bear on the cost of supplying the service in that country.

The limitation of international benchmarking is well recognized. For instance, a report for the European Commission on regulating mobile services notes:

Only if there is a clear case that cost structure, consumer demand characteristics and policy maker's objectives are very similar between two countries would it be appropriate to take the short-cut of using a regulated price from one to inform the best-practice price for another country.¹¹

The Productivity Commission's report on *International Benchmarking of Australian Telecommunications Services* (1999) also recognises the need to take into account international differences in external factors outside the control of industry.

This section assesses the usefulness of international benchmarking as a basis for the regulation of mobile termination charges in Australia by examining the available international evidence in light of the differences between countries that need to be taken into account. In the rest of this section:

- We review the economics of mobile pricing and, in particular, the key cost drivers that can give rise to differences in costs between countries;
- Assess the potential comparators that could be used in an international benchmarking exercise; and

¹¹ Europe Economics, *Cost structures in Mobile Networks and their Relationship to Prices – Final report for the European Commission*, 28 November 2001, p.76.

- Using the above analyses, we review the international evidence to assess what implications can be drawn in relation to the efficient level of termination charges in Australia.

2.1. MOBILE NETWORK COST DRIVERS

In assessing the usefulness of international benchmarking, it is critical to have an understanding of the economics of mobile networks and, in particular, the key factors driving costs. The major cost drivers of mobile networks are:

- Network coverage;
- Busy hour traffic;
- Subscribers;
- Quality of service;
- Technology;
- Input prices; and
- Peak/off-peak traffic ratios

In this section, we discuss how each of these factors impacts costs and review the available evidence of their effects. For a general overview of the structure of mobile networks as background to this discussion, we refer the reader to the UK Competition Commission's report on mobile termination charges and to the Europe Economics report for the European Commission on mobile cost structures.¹²

2.1.1. Network coverage

A defining characteristic of mobile networks, in contrast to fixed networks, is that mobile networks provide subscribers with the ability to make and receive calls from anywhere within the network. A mobile network will be designed to provide a particular level of geographic and in-building coverage and coverage is one of the main factors taken into account by customers in deciding whether to join a mobile network.

¹² In particular, see Chapter 3 of UK Competition Commission, *Vodafone, O2, Orange and T-Mobile Reports on references under section 13 of the Telecommunications Act 1984 on the charges made by Vodafone, O2, Orange and T-Mobile for terminating calls from fixed and mobile networks*, 2003 and Europe Economics, *Cost structures in Mobile Networks and their Relationship to Prices – Final report for the European Commission*, 28 November 2001.

For a given volume of traffic, the greater the coverage area of a network the higher will be the network's unit costs. Coverage will account for the bulk of overall network costs for networks that have large coverage areas and relatively small traffic volumes. However, even for networks in densely populated countries, the cost of coverage can still amount to a significant proportion of total network costs, with the remaining costs relating to the additional capacity required once the initial capacity associated with providing coverage in a particular area has been fully utilised by the traffic in that area.

2.1.2. Busy hour traffic

A second fundamental cost driver of mobile networks is the volume of busy hour traffic, particularly the total volume of calls and call attempts during the busiest hour of operation of the network. Network capacity will be built to cover the expected volume of busy hour traffic with a high degree of reliability, i.e. limiting the number of calls that fail due to an insufficient number of channels at times of unusually high demand.

The extent to which traffic volumes affect unit costs will depend on the impact of scale economies. One main source of scale economies is the ability to recover the cost of providing coverage across larger call volumes. Such scale economies will be greatest for networks with a significant coverage area relative to the volume of traffic and decline geometrically as traffic volumes grow. Scale economies also arise in relation to the network elements required to transport calls between base stations or between a point of interconnection and a base station. This part of the network is similar to fixed networks (indeed, links between base stations and mobile switching centres are often leased from fixed operators). As such, this part of the mobile network gives rise to similar scale economies as are exhibited in relation to the transit part of fixed networks. Other scale economies are likely to arise in relation to network intelligence and network design. Scale economies in the remaining major part of the network, i.e. the equipment required to carry calls between the base stations and handsets, are likely to be exhausted at relatively small traffic volumes.

Separate to scale economies arising from the higher utilisation of network equipment, a larger sized network may also enable an operator to obtain greater discounts from equipment vendors and thereby generate additional savings in unit costs compared with smaller operators.

There are a number of studies of the likely size of scale economies in mobile networks. Foreman and Beauvais undertook an econometric study based on data from 100 cellular market areas of the US operator GTE Wireless.¹³ They found significant scale economies. They use subscriber numbers as a measure of overall

¹³ Foreman, R. D. and E. Beauvais, "Scale Economies In Cellular Telephony: Size Matters", *Journal of Regulatory Economics*, 16 (3): 297-306, November 1999. The authors criticise an earlier study that found diseconomies of scale for wireless telephony on the basis of its very small data sample of 28 observations.

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scale and estimated that a 1 per cent increase in subscribers corresponds to an increase in total costs of approximately 0.82% on average. They also found that areas with a higher number of minutes per cell-channel (i.e. total airtime minutes divided by the product of the number of cell sites and channels in an area) have lower unit costs.

The UK Monopolies and Mergers Commission estimated, on the basis of an analysis of historical movements in Cellnet's costs and volumes and excluding efficiency gains, that a 10 per cent increase in traffic would lead to costs rising by only 6.4 per cent.¹⁴

More generally, the FCC's annual reports on the US wireless competition have noted the role of scale economies in driving the consolidation of the US mobile industry.¹⁵ The Draft Decision also extensively refers to the Commission's own expectation that increases in volumes will lead to falls in unit costs.¹⁶ Given this discussion, it is particularly surprising that the Commission is silent on the impact of scale economies when it comes to consider benchmarking Australian rates off cost estimates for UK and US networks.

2.1.3. Subscribers

A large part of the scale economies arising from higher subscriber numbers arises from the higher traffic volumes generated by a larger subscriber base (i.e. the traffic effect discussed above). However, there are significant network elements that are driven particularly by subscriber numbers rather than minutes, such as the Home Location Register that enables the network to locate its subscribers so that calls can be delivered to those subscribers (i.e. a cost that is incurred in terminating calls but not originating calls). Recognising the impact of subscriber numbers on costs, the 2002 Analysys LRIC model of network costs developed for Oftel¹⁷, includes subscriber numbers as a separate major cost driver in addition to coverage and traffic.

Subscriber numbers will also impact non-network costs. For instance, there are likely to be economies of scale in relation to costs such as marketing, billing software and handset purchases. These costs are relevant to termination as

¹⁴ UK Monopolies and Mergers Commission, *Cellnet and Vodafone: Reports on references under section 13 of the Telecommunications Act 1984 on the charges made by Cellnet and Vodafone for terminating calls from fixed-line networks*, para. 2.307.

¹⁵ See, for instance, FCC, *8th Annual CMRS Competition Report*, paragraph 41. The report by a former Chief Economist of the FCC also discusses the impact of realizing scale economies on the US wireless industry (T. Hazlett, "Is Federal Preemption Efficient in Cellular Phone Regulation?", *Federal Communications Law Journal*, Vol.56, No.1, December 2003).

¹⁶ Draft Decision, pages xi, xii, 57, 72, 81, and 103. .

¹⁷ The Analysys UK model network costing model is available at http://www.analysys.com/default_acl.asp?mode=article&iLeftArticle=1266

subscriber acquisition is a cost that is common to the bundle of services associated with subscribers. In particular, a mobile operator cannot supply any of its services, including termination, if it has not first acquired customers. It is true that an element of acquisition costs can be efficiently recovered in fixed charges as part of a multi-part tariff scheme, as currently occurs. However, there are limits to how much customers are prepared to pay in fixed charges, as evidenced by the explosion in subscriber numbers following the introduction of pre-pay tariffs that greatly reduce the level of fixed charges.

2.1.4. Quality of service

Quality of service is another factor that impacts upon the cost of delivering mobile service. Quality of service can encompass a range of dimensions including the percentage of calls connected and completed successfully (i.e. without being blocked initially or dropped during the call) and the clarity of the call. Given the importance attached to quality of service by subscribers, much recent investment by operators has been aimed at improving call quality in areas that already have some, albeit weak, signal strength.

Many countries have surveys of service quality. These tend to be conducted using vehicle-mounted equipment and thus measure outdoor quality of service. They do not capture the quality of service for in-building calls even though this can also be an important source of difference between operators' services and between operators' costs.

2.1.5. Technology

Network technology is a further factor impacting on the cost of delivering mobile services. Networks using higher frequency spectrum generally require more base stations to provide coverage for a given area than lower frequency networks because of the weaker propagation of higher frequencies. Accordingly, higher frequency networks will tend to incur higher costs than lower frequency networks in providing an equivalent level of coverage and call quality. Oftel estimated that the UK 1800MHz operators would incur around 1.5 cents per minute higher unit costs than the operators using combined 900MHz/1800MHz spectrum.¹⁸

2.1.6. Input prices

For mobile networks, important inputs include telecommunications equipment (handsets and network equipment), spectrum, the cost of capital, labour, land, taxes, USO payments and the impact of topography and regulation (e.g. local government planning restrictions) on network design. The prices corresponding to these inputs can vary significantly from one country to another and also from one period to another. While Purchasing Power Parity adjusted prices could be

¹⁸ Oftel, *Wholesale mobile voice call termination consultation*, December 2003, p. 255.

used, it is unclear whether differences in general price levels would correspond with differences in input prices for mobile services, particularly given the capital intensity of supplying mobile services. In practice, making robust adjustments for differences in input prices between countries is likely to be complicated.

2.1.7. Peak/off-peak traffic ratios

While networks are built for busy hour call volumes, the average cost per minute is calculated with reference to overall traffic volumes. Accordingly, the greater the ratio of off-peak traffic to peak traffic, the lower will be the average cost per minute, i.e. higher off-peak traffic volumes have relatively little impact on overall costs because they do not require additional capacity to be built (up to the level at which the off-peak volumes match the peak volumes). In mobile networks, the peak and off-peak traffic needs to be assessed in relation to particular cell sites. This implies that it is difficult to make cross-country comparisons of the 'peakiness' of mobile traffic, although countries with CBD areas with limited residential populations, such as Australia, could be expected to have a relatively more peaked traffic profile than, say, European countries with large inner-city populations.

2.2. FRAMEWORK FOR SELECTING COMPARATORS

In deciding whether to declare a service and in arbitrating access disputes to declared services, the Commission is required to have regard to the long-term interests of end-users. For the purpose of this report, we interpret this statutory objective as relating to ensuring that termination charges are around their economically efficient level. Thus international benchmarking will be useful only to the extent that it helps in identifying the efficient level of Australian mobile termination charges. Before considering what potential benchmarks are available, it is important to understand the components comprising the efficient level of termination charges. On the basis of well-established economic theory, we believe that the efficient level of mobile termination comprises:

- The Long-Run Incremental Cost (LRIC) of supplying termination services in Australia;
- An efficient allocation of the fixed and common costs incurred in supplying mobile services (i.e. Ramsey pricing); and
- An adjustment for network externalities.

2.2.1. LRIC

An operator would cease supplying a service in the long-run if the revenue they received was below the LRIC of the service. Accordingly, LRIC provides a minimum base for mobile termination charges.

2.2.2. Allocation of fixed and common costs

The supply of mobile services also gives rise to significant fixed and common costs that operators will need to recover from their overall services to remain financially viable. A significant common cost is the cost of coverage. By offering coverage, i.e. the ability to make and receive calls across the mobile network, an operator will attract customers which, in turn, will drive overall outgoing and incoming call volumes and the volume of other mobile services. Another common cost is the cost of subscriber acquisition and retention. A mobile operator cannot supply any of its services, including termination, if it has not first acquired customers.¹⁹ Many head-office costs will also need to be recovered across a range of services

The economic theory demonstrating the efficiency of Ramsey pricing as a means of allocating fixed and common costs to particular services is well established. Ramsey pricing is likely to imply that termination charges should bear a greater contribution to the recovery of fixed and common costs than mobile retail prices. Raising termination charges will only reduce the volume of calls to mobiles to the extent that changes in termination charges are passed through to retail prices for calling mobiles and to the extent that callers are aware of, and sensitive to, prices to call mobiles. In contrast, raising mobile retail prices can be expected to reduce outgoing call volumes directly and, by reducing mobile subscriber numbers, lead to second round effects that further reduce outgoing and incoming, call volumes (i.e. fewer mobile subscribers to call and to be called). The empirical evidence from the UK supports *a priori* reasoning that termination should bear a greater contribution to the recovery of mobile fixed and common costs.²⁰

We note that the Commission contemplates elasticity figures for fixed-to-mobile calls which imply a high degree of price sensitivity (Draft Decision, p.126). Part of the explanation stems from a transcription error in which a study, *Review of price elasticity of demand for fixed line rental* by Frontier Economics, cited an Access Economics' elasticity of demand for fixed to mobile calls of -0.8 when the estimated elasticity in the Access Economics report appears to be -0.08 .²¹

¹⁹ Similarly, newspapers and commercial television offer both advertising space to advertisers and content to readers / viewers, but are only able to generate advertising revenue if they have a subscriber base that advertisers wish to reach. Advertising revenue thus contributes (very substantially) to the recovery of the common cost of building and retaining a readership or audience.

²⁰ See, for instance, C. Koboldt and D. Maldoom, *Optimal fixed-to-mobile interconnection charges* (available at <http://www.dotecon.com/images/reports/rmsyits.pdf>).

²¹ While we have not had access to the Access Economics report, we note that an earlier Frontier Economics report, *Regulation of fixed to mobile termination charges* (October 2001) submitted to the Commission reports an elasticity of demand for fixed to mobile calls of -0.08 . While the Commission also refers to an elasticity used by Macquarie Research Equities, no information has been provided on how the significant methodological issues involved in calculating mobile elasticities was dealt in developing that estimate.

We also note that while it will be efficient for some fixed and common costs to be recovered in fixed/monthly charges, mobile subscription is much more elastic than fixed subscription and this limits the extent to which costs can be efficiently recovered from fixed charges. For instance, the mid-point in the range reported by Frontier Economics for the elasticity of mobile subscription/access is -0.3 whereas the mid-point of the range for the elasticity of fixed line monthly access is only -0.06 .²²

2.2.3. Network externalities

Network externalities will affect the efficient level of termination charges, in particular in altering the efficient allocation of fixed and common costs. We note that some other parties have argued that network externalities are not relevant in Australia given the market's 'maturity'. From a European perspective, it is unclear what is the basis for the Australian market being labelled mature, particularly given that Australian penetration rates are substantially below those in the leading European markets.²³ In any event, even if the Australian market were coincidentally at the socially optimal number of subscribers at this point in time, cutting termination rates can be expected to force up prices to marginal mobile subscribers and lead to a drop in subscribers from current levels (i.e. mobile subscription is not perfectly inelastic). The underlying economic logic is compelling. Operators will seek to acquire customers provided the overall revenues associated with those customers, including termination revenues, provides a reasonable return on the cost of acquiring the customer. If termination revenues fall, then operators will need to raise the retail prices of mobile services or decrease acquisition costs (i.e. reduce the level of handset subsidies) for them to be willing to acquire marginal customers (this is regardless of the overall profitability of the operators). Either way, the overall cost faced by marginal mobile customers will rise and mobile customer numbers can be expected to fall over time.

The FCC identifies relatively high mobile termination charges as a key explanation for European countries having much higher mobile penetration rates than the US, despite relatively high incomes in US. The FCC states:

²² Frontier Economics, *Review of price elasticities of demand for fixed line and mobile termination services*, August 2003.

²³ For instance, the Commission reports a mobile penetration rate for Australia of around 71.9 – 73.0% (Draft Decision, p.20) whereas the European Commission reports an average EU mobile penetration rate in 2003 of 80.9% and significantly higher in some countries (EC, *Ninth Implementation Report 20003, Annex 1*). Whereas comparisons between countries need to take into account differences in the treatment of 'inactive' customers, it appears that there is nonetheless a significant segment of Australia's population who do not currently have a mobile but could become mobile subscribers.

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*the termination revenues carriers receive on incoming calls under CPP may offset acquisition and billing expenses by enough to make it worthwhile for mobile carriers to compete for the business of such low-volume users.*²⁴

Regulators should be aware of the danger that in seeking to drive mobile termination rates down to US levels, they risk forcing mobile penetration rates down towards US levels.

The UK experience following the cut in termination charges in July 2003 has been an increase in mobile retail prices for low use customers and a fall in mobile penetration, particularly amongst low income earners. Oftel statistics show an increase in the total cost of mobile packages for low use and low/medium use mobile customers between July 2003 and October 2003 of *15 per cent and 11 per cent respectively*.²⁵ Oftel statistics also show overall mobile penetration falling between May and August 2003 from 75 to 73 per cent and mobile penetration amongst households on incomes below £17,500 falling from 64 to 60 per cent.²⁶

The loss in mobile subscribers is a key source of consumer harm from regulating mobile termination rates downwards and yet the Commission has appeared to dismiss this risk on the basis of its less-than-full understanding of the UK experience. Further, the loss in mobile subscribers harms both the ex-mobile subscribers and also the fixed-to-mobile callers who can no longer contact them on their mobile phones.

Finally, we note that while fixed subscription is empirically substantially less elastic than mobile subscription (see previous section), regulators nonetheless take account of fixed externalities, particularly in USO arrangements. Mobile subscribers effectively help fund Australia's USO arrangements through the levy on mobile revenues.

2.2.4. Summary

Identifying the efficient level of termination charges is a complex exercise that involves an analysis of incremental costs, the efficient allocation of fixed and common costs and an allowance for network externalities. If regulation is to be based on international benchmarks, then benchmarks need to be chosen that reflect all the components of the efficient charge level and that take into account factors that lead to differences between countries in relation to these components.

²⁴ US FCC, *Eighth Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, para. 209 (available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-150A1.pdf).

²⁵ Oftel, *Mobile Price Monitoring*, October 2003 (available at http://www.ofcom.org.uk/static/archive/oftel/publications/market_info/including.xls).

²⁶ Oftel's *Consumers' use of mobile telephony Q14 August 2003*, published 27 October 2003 (available at <http://www.ofcom.org.uk/static/archive/oftel/publications/research/2003/q14mobres1003.pdf>).

2.3. ASSESSING POTENTIAL COMPARATORS

This section identifies and assesses potential international comparators that could be used as a basis for regulating Australian mobile termination charges.

2.3.1. UK estimates

The Commission has advised that its Draft Decision relies on an UK estimate taken from Oftel's report, *Review of the charge control on calls to mobiles*, released on 26 September 2001. The figure of 4.76 pence per minute relates to estimates for UK operators' costs in 2005/06 and exclude Oftel's estimated externality surcharge.

The Commission's choice of UK estimate is peculiar:

- Oftel has recognized that its 2001 cost estimate was significantly flawed. Oftel's latest estimate (published well before the Commission's Draft Decision) of its target charge for 2005-06 is 5.46 pence per minute or around 14.0 cents per minute.²⁷ We believe that this estimate is still subject to significant downward bias. Ofcom is expected to announce its final estimate of the target termination price around the end of May 2004.
- The Oftel estimate chosen by the Commission is based on Equal Proportionate Mark-Ups and the exclusion of an adjustment for network externalities.
 - However, a key argument put forward by the Commission's proposal to regulate is that, absent regulation, prices cannot be guaranteed to be around Ramsey levels. Presumably, the Commission must then believe that any regulation should be designed taking into account Ramsey pricing principles, i.e. so that it could be confident of moving prices closer to their welfare maximising levels.
 - The Commission has offered no coherent argument for rejecting an externality adjustment in any regulated price, particularly one based on the more thorough analysis undertaken by the UK regulators. In fact, the Commission's Draft Decision acknowledges an error in the UK regulators' approach that has led to the UK regulators underestimating the optimal externality adjustment. On page 136 of the Commission's Draft Decision, the Commission correctly states that optimal externality is determined by "equating the marginal efficiency gain (MEG) from applying the subscription subsidy with the marginal deadweight loss (MDWL) from applying the mobile termination

²⁷

See Oftel, *Wholesale mobile voice call termination consultation*, December 2003, p.284. The figure is calculated by taking the 2004/05 target nominal rates, bringing forward to 2005/06 by the RPI-X% adjustment factor and assuming an RPI of 1.6% (based on 2004 forecast from the IMF's *World Economic Outlook*, April 2004). A simple average has then been taken of the rates for two types of operators.

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surcharge.”²⁸ The UK regulators has erred in equating the marginal efficiency gain with the total value of the subsidy, without recognizing that most of the subsidy represents a transfer rather than a deadweight loss.

In fact, there exists a number of estimates of the efficient level of termination charges in the UK that incorporate both Ramsey pricing considerations and an allowance for the network externality. Studies presented on behalf of the UK mobile operators to the UK Competition Commission estimated socially optimal mobile termination charges around 15 pence per minute.²⁹ Oftel’s own Ramsey model (developed by its consultant Dr. Rohlfs) based on Oftel’s own assumptions estimated a welfare maximizing termination charge of 14.48cpm, about 1.64cpm higher than the charge level determined with reference to Equal Proportionate Mark-Ups (both figures in 2000/01 pounds).³⁰ The welfare maximizing estimate has not been revised in light of the more recent upward adjustments to the estimated costs which would also raise the welfare maximizing estimate.

We believe that the welfare maximizing level of termination charges estimated by Oftel’s model should represent the minimum value chosen for the UK as a comparator.³¹ Nonetheless, for the purpose of the benchmarking exercise in this report, we have sought to be conservative and thus have used the nominal average 2005-06 target charge proposed in Oftel’s 2003 consultation of around 14cpm.

Next we consider adjustments to the UK comparator to take account of the substantial differences in conditions impacting on costs between Australia and the UK (see Table 1 below).

²⁸ The Commission then incorrectly proceeds to state: “This must result in a subsidy of less than the full amount of the marginal external effect.” This is precisely the error committed by the UK regulators. Given that most of the subsidy will represent a transfer rather than a dead weight loss, the overall value of the subsidy will be greater than the marginal efficiency gain.

²⁹ See UK Competition Commission, *Calls to mobiles report*, 2003, Chapter 9.

³⁰ A copy of this model is available at <http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/2003/gain0703.htm> . While Oftel has not to date decided to base its price on its own model’s estimate of the welfare maximizing charge, its reasoning seem to amount to an argument that its choice of a lower number than the central estimate may still be in the range of the socially optimal charge (even if not the best estimate). See Oftel’s discussion in *Wholesale mobile voice call termination consultation*, December 2003, para. L.29.

³¹ There are a number of downward biases that imply this number may be too low, such as the assumption of equal own-price elasticities (rather than empirically based elasticity estimates) and the underestimation of certain costs.

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Table 1. Representative Networks in the UK and Australia

	Cost Based Estimate (cpm)	Network Coverage (Mil Km ²)	Traffic (Mil mins)	Subscribers (Mil)	Subscriber per mil km ²	Labour Costs	Land Costs per m ² p.a.
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)
UK	9.71	0.22	13,457	11.73	54	28	2,551
Australia	26.80	0.62	6,134	5.55	9	20	604

Sources and Notes:

- (1) For the UK: Draft Decision, page 284. Adjusted for inflation, see <http://www.imf.org/external/pubs/ft/weo/2004/01/pdf/chapter1.pdf>. For Australia: See section 2.3 of this report.
- (2) For the UK: O2's Annual Review 2002 reports that its network covers 90% of the UK land mass. The UK's total land mass is 241,590 sq km (CIA's *The World Factbook*). For Australia: Data provided by Optus.
- (3) For the UK: Oftel Mobile Update, October 2003. For Australia: Data provided by Optus.
- (4) As in (3) above.
- (5) Col (4) divided by Col (2).
- (6) <http://www.ilo.org/public/english/bureau/stat/portal/online.htm>. Exchange rates used correspond to May 20th, 2004 obtained from the RBA. http://www.rba.gov.au/Statistics/exchange_rates.html
- (7) http://www.rics.org/downloads/property_in_business_summ.pdf and <http://www.cushmanwakefieldeurope.com/servlets/cw-research/marketresearch/GetSample?docId=91>

A key difference between the UK and Australia is in relation to network coverage. The coverage area of a typical UK mobile network is just over 0.22 million square kilometres.³² On the basis of a version of the Analysys LRIC model, Oftel estimates that the costs of providing the coverage of the UK operator's amounts to 21 per cent of their total network costs.³³ Dividing across UK minutes, this translates to around 2.0 cents per minute.³⁴

In comparison, Optus network covers 0.62 million square kilometres, over 2.8 times the area of a UK network. Telstra's CDMA network is even larger at more than 1.4 million square kilometres.³⁵ If a UK network with UK volumes had to recover the cost of the Optus' network coverage, the costs associated with

³² O2's *Annual Review 2002* reports that its network covers 90% of the UK land mass. The UK's total land mass is 241,590 sq km (CIA's *The World Factbook*).

³³ Oftel, *Network common costs*, 19 February 2002, Table 2.

³⁴ Oftel's *Wholesale mobile voice call termination consultation* (Appendix 5, Table 8) of December 2003 estimates an average network unit cost for the UK operators of 4.17ppm so that, assuming coverage accounts for 21% of total costs, the unit cost of coverage represents 0.88ppm.

³⁵ Telstra, *2003 Annual Report*, p.21.

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coverage could be around 5.8cpm (assuming other factors constant), or 3.7cpm higher than the UK. This would suggest a welfare maximizing charge level of 18.2cpm, adjusting for the difference in coverage alone.

Another key difference is in relation to traffic volumes and subscribers. An indication of the impact of the lower average traffic volumes of Australian operators can be obtained by adjusting for the need to recover Optus' coverage over its lower volumes, 6.1 million minutes.. Multiplying the ratio of average UK minutes to Optus minutes with the associated coverage costs of the Optus network yields 12.7cpm as Optus cost related to providing coverage. This implies a total cost for termination for Optus, taking into account the need to recover a greater coverage area over fewer minutes of 25.1cpm.

So far we have not considered any loss in economies of scale associated with Australian networks having fewer subscribers and lower call volumes, apart from the direct impact on the cents per minute for recovering coverage costs across lower call volumes. The other estimates of the economies of scale in mobile networks discussed in Section 2.1.1 above can also be used to identify an indicative range for Australian operators' termination costs. First, we consider the impact of different volumes alone, i.e. without any changes for the difference in coverage. Thus we are effectively calculating the unit costs of a UK operator with UK coverage, but with only Australia's subscribers and call volumes. Applying Foreman and Beauvais finding (that a 1% increase in subscribers will increase costs by just 0.82%), the lower Optus volumes would yield a unit cost of 20.1cpm.

A similar approach can be used applying the economies of scale estimate of the UK Monopolies and Mergers Commission ('MMC'). The MMC held that 10% increase in minutes would lead to a 6.4% increase in costs. Thus Australia's lower volumes would imply the need to increase the Ofcom cost estimate to 21.2cpm. This alternative methodology provides a check on the reasonableness of the estimate based on the Foreman and Beauvais' finding.

To complete the analysis, we combine the coverage effects with the volume effects, that is, we take into account both Australia's larger coverage area and the loss in economies of scale associated with Australia's lower subscriber numbers and call volumes. Using parameters for the Optus network and the Foreman and Beauvais' estimate of economies of scale, we calculated a termination costs for Optus of 33.5cpm.

In addition to differences in coverage, minutes and subscribers, input costs can also give rise to significant cost differences between countries. Telecommunications is highly capital intensive so that it may not be appropriate to use differences in general (consumer) price levels as a guide to differences in input prices. In terms of the large cost items of telecommunications equipment, we do not believe that these are likely to be lower in Australia than in the UK or US. Indeed, we note that the Productivity Commission has suggested they may be higher:

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Most of the countries included in this benchmarking study have sophisticated and globally competitive manufacturing and software industries supplying these inputs. However, equipment costs in Australia and New Zealand may be higher than in European and North American countries and Japan. In the past, local manufacturing was protected, which may have increased the cost of specialized inputs in Australia relative to other countries.³⁶

There are, however, some cost factors that act to lower the cost faced by Australian operators, particularly Australia's relatively low labour and land costs. We estimate that labour costs would account, directly or indirectly, for at most 30 per cent of the costs of supplying mobile services.³⁷ We also estimate that land costs would account for at most 15 per cent of the costs of supplying mobile services.³⁸ We estimate that adjustments for these costs would reduce the indicative level of Australian mobile termination costs to 26.8cpm.

We have examined key factors likely to cause cost differences between Australia and the UK. While our estimates can only be taken as indicative given the range of factors actually in operation, we nonetheless have sought to adopt conservative assumptions. On the basis of Ofcom's cost estimate, and taking into account key differences in supply conditions, we have determined an indicative estimate for Optus' mobile termination costs of 26.8cpm. The other operators' termination costs will vary around this level taking into account their own coverage areas, traffic and subscriber numbers.

2.3.2. US rates

The Draft Decision also states that the Commission has had regard to estimates developed by Sprint in relation to its networks in California, Florida and New York. We note that these estimates have been developed in line with rules set out in the US *Telecommunications Act 1996* in relation to fixed incumbents and estimates of the additional traffic sensitive costs of transport and termination. We note the US rules have been described as 'reverse Ramsey pricing' in which an inefficiently small proportion of common costs are recovered from relatively demand insensitive critical network elements such as local loops.³⁹ The

³⁶ Productivity Commission, *International Benchmarking of Australian Telecommunications Services*, March 1999, p. 190.

³⁷ Telstra's *Annual Report 2003* indicates that around 20 per cent of Telstra's costs relate to labour costs. We have used the higher figure of 30 per cent to capture the impact of local labour costs embedded in equipment and other costs.

³⁸ This is based on an analysis of operators' account. Again a relatively high ratio has been assumed. We note the assumption is also in line with other telecommunication studies, see J. H. Rohlfs and J. G. Sidak, "Exporting Telecommunications Regulation: The U.S.-Japan Negotiations on Interconnection Pricing" in *Harvard International Law Journal*, Vol. 43, No. 2, Spring 2002.

³⁹ See J. G. Sidak and D. F. Spulber, *Deregulatory takings and the regulatory contract: the competitive transformation of network industries in the United States*, Cambridge University Press, 1997, p.369-70.

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competition concerns with fixed incumbents put forward by US regulators to justify such a pricing approach do not apply in the case of mobile termination. Furthermore, the US rules do not take into account mobile-specific pricing considerations such as the treatment of coverage as a common cost.⁴⁰ In addition, the US rules do not provide for network externality adjustments, which are accounted for in the fixed network context by separate USOs.

Even in terms of the specific US rules, we note that the New York State Public Service Commission described it as a “serious flaw” that the Sprint model did not distinguish the cost of terminating a call from originating a call.⁴¹ Thus to the extent that termination costs are above originating costs (as Sprint itself testified and as supported by our analysis of mobile cost structures in Section 3 below), the estimate of the model would be too low.

The context in which the Sprint estimates were developed should also be considered. In the absence of having its own cost estimates accepted (quickly) by the US state regulators, Sprint would only be entitled to receiving the regulated termination rates of the interconnecting local fixed incumbent. For instance, in the State of New York, Sprint would only be entitled to Verizon’s termination rates of US\$0.00107.⁴²

The above discussion suggests that the US estimates are likely to be significantly below the efficient level of mobile termination charges even for those US states to which they relate. Thus, while we can use the US estimates to develop a benchmark for Australian termination rates, the benchmark is likely to be at the low end of the range in which Australian rates should lie. Bearing this in mind, we now seek to adjust for key differences in cost factors between the selected US states and Australia (see Table 2 below).

⁴⁰ Indeed, precisely because coverage is not traffic sensitive, the NY fixed incumbent argued that it should not be recognised at all under US rules to determine termination charges. See State Of New York Public Service Commission - CASE 01-C-0767 – *Arbitration Order*, 23 August 2002, p.37(available at [http://www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/ArticlesByCategory/EC45582B9742023E85256DF1007568F1/\\$File/doc12122.pdf?OpenElement](http://www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/ArticlesByCategory/EC45582B9742023E85256DF1007568F1/$File/doc12122.pdf?OpenElement))

⁴¹ Ibid, p.19.

⁴² Ibid, p.6.

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Table 2. Australia and Sprint's Network in 3 US States

	Cost Based Estimate (cpm)	Network Coverage (Mil Km ²)	Traffic (Mil Mins)	Subscribers (Mil)	Subscriber/ Mil Km ²	Labour Costs	Land Costs per m ² p.a.
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)
New York	10.70	0.02	484	0.80	33	22	1,329
California	14.12	0.07	1,001	1.66	24	22	1,538
Florida	8.33	0.06	569	0.94	15	22	666
Australia	11.52	0.62	6,134	5.55	9	20	604

Source and Notes:

- (1) US: Draft Decision, page 284. Adjusted for inflation - <http://www.imf.org/external/pubs/ft/weo/2004/01/pdf/chapter1.pdf>. Australia: See section 1.3
- (2) US: CRA estimates from observing geographical coverage (www1.sprintpcs.com). Australia: Provided by Optus.
- (3) US: Col (4) * (Avg. MOU per customer /Percentage of MOU to Total Calls). http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-150A1.pdf and http://www.mobilein.com/calling_party_pays.htm. Australia: Provided by Optus.
- (4) Statewide subscribers * Sprints nationwide market share. Source: FCC's Eighth Report of Mobile Services, and www1.sprintpcs.com.
- (5) Col (4) / Col (2).
- (6) <http://www.ilo.org/public/english/bureau/stat/portal/online.htm>. Exchange rates used correspond to May 20th, 2004 obtained from the RBA. http://www.rba.gov.au/Statistics/exchange_rates.html
- (7) http://www.rics.org/downloads/property_in_business_summ.pdf and <http://www.cushmanwakefieldeurope.com/servlets/cw-research/marketresearch/GetSample?docId=91>

On a general point, we note that it is difficult to obtain accurate estimates for the key characteristics of the Sprint network in the three US states at the time of the cost studies, particularly as Sprint is a national US network. The cost studies essentially relate to a small part of Sprint's national network, focused around some heavily populated urban areas.

We have estimated the coverage of the Sprint network in the selected states based on coverage maps for Sprint's current network. This is likely to *substantially overstate* Sprint's network at the time of the cost studies that we understand largely relate to the years 2000 and 2001. A historical feature of the development of the US mobile networks was that roaming onto other networks was commonplace even within states and thus each network initially limited its own coverage. Customers concerns with high roaming charges have subsequently led to greater network roll-outs. It is clear that in building its networks in cities such as New York, Miami and San Francisco in 1997, Sprint focused on providing a

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service in metropolitan areas.⁴³ Sprint's 2001 Annual Report also notes that it provides its service through a combination of:

- Operating its own digital network in *major U.S. metropolitan areas*,
- Affiliating with other companies, mainly in and around smaller U.S. metropolitan areas,
- Roaming on other providers' analog cellular networks using multi-mode handsets, and
- Roaming on other providers' digital networks that use code division multiple access (CDMA)" (italics added).⁴⁴

Sprint's 2001 Annual Report also notes that it met its license conditions to cover one third of the population in the license area in 2000 and that it had an additional 5 years in which to cover two thirds of the population.⁴⁵

If Sprint's network was largely an urban network at the time of the cost studies, then there is little surprise that the unit cost estimates are so low. Moreover, the Sprint's estimates would provide little indication of the costs incurred by the current Australian networks in providing coverage that extend to extremely remote towns.

One key insight from the Sprint cost estimates is that even between densely populated US states, the estimated costs of termination can differ by 70 per cent for the same operator, with the same network and the same modelling methodology. Given the much greater differences between Australia and the US than between the selected US states, it should be expected that Australian costs would vary significantly with those of the US states.

We have sought to estimate the impact of differences in coverage, subscribers and traffic to determine an Australian benchmark from the US estimates. Using the same methodology we applied in developing the UK benchmark, we estimate the impact of the need to recover Optus' coverage across Optus' traffic when applied to the cost estimates for each US state. The New York, Florida and California estimates yield a cost of 12.7cpm, 7.92cpm and 13.9cpm respectively. The average across the three states is 11.5cpm.

43 In winning spectrum licences, Sprint states that "...markets, including New York, San Francisco, Dallas/Ft. Worth, Boston, Miami, Minneapolis/St. Paul, Denver, Seattle and Kansas City, will launch on a market-by-market basis in the first half of 1997...Sprint PCS service will be available in 65 cities" (*Sprint wins wireless licenses in 139 markets in latest round of PCS auctions*, 14 January 1997, available at http://www3.sprint.com/PR/CDA/PR_CDA_Press_Releases_Detail/0.3681,1421.00.html).

44 *Sprint 2001 Annual Report Form 10-K/A*, p.3-4.

45 *Ibid*, p.7.

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These estimates do not take into account the additional economies of scale derived from the much larger size of Sprint's national network. Sprint had 13.6 million mobile customers in 2001⁴⁶, more than double Optus' current mobile subscriber base. As we do not have national cent per minute cost estimates for the Sprint network, it is not possible to undertake a full comparison of Sprint's national network with the networks of the Australian operators. Accordingly, the US benchmarks based on the individual States' estimates, unadjusted for Sprint's additional economies of scale, should be regarded as a lower bound for Australian termination costs.

Another illustration of the potential impact of lower population densities can be gained from considering differences in the TELRIC for local loops between the US States. The US *Telecommunications Act 1996* provides a uniform national TELRIC methodology to be applied across the States in calculating the long-run incremental cost of network elements. Average cost estimates in individual States will vary reflecting differences in population densities and geographic conditions. The TELRIC estimates determined by State regulators in 2004 of local loop monthly costs range from US\$7.01 to US\$23.72.⁴⁷ The highest cost estimate is for Montana which has a population density much closer to Australia's than the other States, particularly the populous States of California, Florida and New York.⁴⁸ The average estimate for California, Florida and New York is US\$12.19. Were mobile termination costs to vary as much as local loop costs, then the mobile termination TSLRIC in US states would range as high as 20.25cpm.⁴⁹ The actual cost for mobile termination may rise to above or below this figure depending upon how the particular drivers of mobile service costs vary between the States.

⁴⁶ Sprint 2001 Annual Report Form 10-K/A, p.31.

⁴⁷ National Regulatory Research Institute, *Survey of Unbundled Network Element Prices in the United States – Matrix of prices* (updated January 2004), Appendix 3, page 2, <http://www.nrri.ohio-state.edu/documents/BillyJackGreggUNEmatrix1-04.xls>

⁴⁸ Australia's population density of 2.5 people/km² compares with that of Montana (2.4/km²), California (83.9), Florida (114.5/km²) and New York (155.2/km²). US population densities from the US Census Bureau for 2001 (available at <http://quickfacts.census.gov/qfd/>) and converted into people per square kilometre. Population density is not the exact cost driver, but differences in densities can be used to proxy differences in cost drivers where patterns of urbanisation and coverage are similar. Note that the need to provide mobile coverage over areas, such as major roads, is in contrast with fixed networks where housing/building patterns are more critical.

⁴⁹ This is calculated by taking the average TSLRIC estimate of 10.41 cpm for California, Florida and New York from Table 5.3 of the Commission's Draft Decision and increasing it by the same ratio as Montana's monthly local loop costs of US\$23.72 to the average monthly local loop costs of California, Florida and New York of US\$12.19.

2.3.3. Other international estimates

We also note that the Commission's target price is at the bottom of the range of recent European mobile termination cost estimates and regulatory decisions, despite the expectation that European countries will generally have lower costs reflecting smaller coverage areas and higher volumes of calls.

The published or reported estimates by source or country are summarised in Table 3 below.

Table 3. Recent European Mobile Termination Cost Estimates⁵⁰

Source or Country (Year)	Estimates (in Australian cpm)
Europe Economics (2001)	14 (urban), 48 (rural)
Austria (2000)	24
Belgium (2003)	27-34
Finland (2004)	16
France (2004)	17
Italy (2003)	26
UK (2003 and estimates for 2005/06) ⁵¹	13-15
ACCC's proposed target price	12

A study for the European Commission estimated Long Run Average Incremental Costs (LRAIC)⁵², covering only network costs, of 14cpm for an urban network and 48cpm for a rural network.⁵³

⁵⁰ The table shows estimates determined by, or on behalf of, regulators that are explicitly stated to be based on an analysis of costs. References are provided in this section.

⁵¹ This is Ofcom's proposed target charge for 2005-06, incorporating an externality adjustment in the allocation of common costs.

⁵² LRAIC is equivalent to the Commission's TSLRIC.

⁵³ Europe Economics, *Cost structures in Mobile Networks and their Relationship to Prices – Final report for the European Commission*, 28 November 2001, p.98-99.

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The Austrian regulator estimated, using a LRAIC methodology, a cost for mobile termination for the major Austrian operators of 0.24cpm in 2000 and particularly noted the result that the cost of termination was found to be above the cost of origination.⁵⁴ In 2003, the Austrian regulator reduced mobile termination rates for the major operators to 19cpm and capped the smaller operators' rates at 34cpm.⁵⁵

The Belgium telecommunications regulator, IBPT, estimated the termination costs of the Belgian operator Mobistar to be between 27-34cpm in its decision of 23 September 2003.⁵⁶ We note that while MCI has previously submitted an estimate for Belgium to the Commission, this was a figure put forward by a Belgian cable operator seeking lower mobile termination charges and that was rejected by the Belgian regulator.⁵⁷

In Finland, cost-based rates for termination for mobile-to-mobile calls, applying from March 2004, were set at 16cpm.⁵⁸

The French regulator, ART, determined rates of 26cpm applying from 1 January 2004.⁵⁹ ART has recently announced a consultation to consider rate levels for future years, noting that on the basis of operators' cost information it estimated a termination cost of around 17cpm.⁶⁰

54 Telekom-Control GmbH, *Cost orientation for interconnection in mobile networks*, November 1999 (available at [http://www.rtr.at/web.nsf/lookuid/B96E75F4D774BCACC1256E66002AEED1/\\$file/CostOrientationIC.pdf](http://www.rtr.at/web.nsf/lookuid/B96E75F4D774BCACC1256E66002AEED1/$file/CostOrientationIC.pdf)).

55 Telekom-Control Commission decision of 15 April 2003 (http://www.rtr.at/web.nsf/englisch/Portfolio_Presseinfos_nach+Datum_PresseInfoDatum_PInfo15042003TK?OpenDocument).

56 [Décision du Conseil de l'IBPT du 23 septembre 2003 relative aux charges de terminaison de Mobistar](http://www.ibpt.be/ibpt.htm), available at <http://www.ibpt.be/ibpt.htm>

57 The role of international carriers in the regulatory debate in Australia and elsewhere does serve to highlight one of the welfare losses to Australia from lowering mobile termination rates, i.e. the reduction in termination charges will reduce the amount paid by international carriers for terminating calls in Australia. Normally Government authorities are tasked with increasing, not decreasing, export earnings.

58 Reported at <http://biz.yahoo.com/pz/040303/53587.html>

59 ART decisions nos. 03-1113 and 03-1114 of 27 October 2003 (<http://www.art-telecom.fr/eng/index.htm>).

60 ART, *Consultation publique sur l'analyse du marché de gros de la terminaison d'appel vocal sur les réseaux mobile*, April 2004, p.112.

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The Italian regulator, AGCOM, determined a mobile termination rate of 26cpm in 2003 for operators with Significant Market Power (SMP), noting that this rate corresponded with the operators' audited costs. AGCOM also scheduled reductions of 10 per cent per year in the charge level in line with expected efficiency gains.⁶¹

The Netherlands regulator approved rates of 27-30cpm for 2004, falling to 19-21cpm on 1 December 2005, as being in the interests of end-users.⁶²

We understand that LRIC estimates will soon be available for Sweden and are in development for a number of other European countries. Benchmarking is also under consideration in other European countries and to assist in this regard, the Independent Regulators Group has recently published a benchmark of European mobile termination charges showing a European average termination charge of around 24cpm.⁶³

If the Commission proposes to use international benchmarking to estimate the costs of termination in Australia, then it would be desirable to assess the full range of international cost estimates available and make adjustments for differences in supply conditions between the comparators and Australia.

2.3.4. Summary

It would be remarkable were the costs of the Australian operators to be as low as the cost estimates of supplying mobile services in the UK or in the US States chosen by the Commission as comparators, given differences in key cost drivers. Even between European countries and, indeed, between the Commission's selected three populous US States, estimated termination costs differ significantly. As indicated above, once differences in supply conditions are taken into account, the efficient level of termination charges for Australian operators are likely to be substantially above the estimates relied on by the Commission.

⁶¹ Autorità per le garanzie nelle comunicazioni, *Annual Report on activities carried out and work programme*, June 30th 2003 (available at http://www.agcom.it/rel_03/eng/Relaz_eng_part04.pdf, p.146).

⁶² OPTA, Mededeling inzake belied OPTA ten aanzien van mobiele terminating tarieven, 4 December 2003, (available at <http://www.opta.nl/download/Mededeling%20MTA.pdf>).

⁶³ IRG, *IRG Snapshot of Mobile Termination Rates (MTR)*, 23 April 2004 (available at <http://irgis.anacom.pt/admin/attachs/385.pdf>).

3. ANALYSIS OF OPERATORS' COSTS

The Draft Decision notes that, in forming a view of the target termination price, the Commission has had regard to its own analysis of Telstra's cost data provided under the Regulatory Accounting Framework as well as modelling undertaken by an Australian carrier that has subsequently been made available to Optus and CRA.

Both of these analyses do not estimate the Long Run Incremental Cost (LRIC) of terminating a call. As such, they provide little information on the marginal cost of terminating calls even though the efficiency properties of marginal-cost pricing are well recognised and provide the rationale for the adoption of LRIC-based pricing methodologies by telecommunications regulators around the world. In the absence of a careful examination of the extent to which particular services actually cause costs to be incurred, the analyses conducted by the Commission and by the other carrier generate an arbitrary allocation of costs that may bear little relation to the efficient level of termination charges.

Specifically in relation to mobile termination, approaches that are not based on an economic approach focusing on cost causation can be expected to underestimate the efficient level of termination charges for a number of reasons:

- The unit costs of terminating a call are typically higher than originating a call because the originating operator typically has no knowledge of the location of the mobile subscriber being called and thus the call is handed to the terminating operator at the closest point of interconnect (requiring relatively little transit in the originating operator's network). The terminating operator then conveys the call to the mobile subscriber potentially incurring significant transit costs. For instance, in the case of a Telstra customer in Sydney calling an Optus mobile subscriber in Perth, the call would be handed to the Optus network in Sydney and then transported by Optus to Perth.
- Termination also uses network components that are not used in providing outbound call services, such as the cost incurred in locating the called party so that the call can be delivered.
- On-net calls use less of the network than the sum of an origination leg and a termination leg because no communication is necessary between networks and duplications/inefficiencies in routing resulting from the need to carry off-net calls to and from points of interconnect can be avoided.

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- Analysis based on accounting depreciation will tend to underestimate economic depreciation in years in which asset utilisation is high. For the UK operators, Oftel found that economic depreciation was higher than accounting depreciation for all years after 2000/01.⁶⁴
- Analysis based on company accounts tend to underestimate the required economic return as a result of a number of factors including the exclusion or understatement of intangible assets (such as a trained workforce)⁶⁵, the need to assess profitability over the lifetime of the investment (noting that losses in early years will need to be compensated for by higher returns in later years) and the failure to recognise that for risky investments firms will need to receive returns above their cost of capital if the investment turns out successfully to compensate for the risk of returns below the cost of capital if the investment fails.⁶⁶
- Efficiency requires termination to bear a greater proportion of the fixed and common costs of supplying mobile services and for termination to include a surcharge in relation to network externalities (the reasoning is discussed in Section 2.2).
- Where costs are also allocated to data services, there is a danger that too many costs may be allocated to these services relative to their incremental costs and correspondingly too little costs allocated to incoming and outgoing calls. For instance, SMS messages are delivered using only the signalling channel and will wait until capacity is free rather than needing to be delivered in real-time (and thus limited the need for additional capacity). The UK Competition Commission report notes “that the impact of SMS on equipment requirements was minimal.”⁶⁷ Oftel in its December 2003 consultation estimated that only 4.5% of operators’ costs related to data services, noting that the figure covers more than just the incremental costs exclusively associated with data but includes radio capacity installed, at least in part, with meeting the requirements of data services.⁶⁸

⁶⁴ Oftel, *Mobile phones inquiry: mobile termination – accounting depreciation based cost estimates*, 3 May 2002 (available at http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/account_let0502.pdf).

⁶⁵ A general discussion of approaches to recognising intangibles is contained in the UK Competition Commission’s report, *The supply of banking services by clearing banks to small and medium-sized enterprises: A report on the supply of banking services by clearing banks to small and medium-sized enterprises within the UK*, 14 March 2002, para. 2.248ff.

⁶⁶ These include all risks impacting on returns, such as technological and commercial risks, and importantly they are the risks incurred at the time the investment was made.

⁶⁷ UK Competition Commission, *Calls to mobiles report*, 2003, para. 2.295.

⁶⁸ Oftel, *Wholesale mobile voice call termination consultation*, 19 December 2003, para.F.72.

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Quantifying the overall impact of all these factors is not a simple exercise and explains the time taken in LRIC modelling exercises. However, the presence of these factors imply that regulation of mobile termination charges that does not take the factors into account risks leading to inefficiently low prices.

It should be noted that unlike the case of fixed network incumbents, there is no basis to believe that the actual costs of the mobile operators would include significant inefficiencies. This is because the mobile networks have been developed in highly competitive markets providing an additional discipline to minimise costs in addition to shareholder pressure. The equipment in mobile networks is also much more recent than many parts of fixed incumbents' networks.

We also have further concerns with the specific analysis undertaken by the Commission and the other carrier. While we have had limited opportunity to review the Commission's analysis of Telstra's costs, we believe that many of the general concerns noted above are likely to affect the Commission's analysis and imply a significant underestimation of Telstra's costs of supplying mobile termination. In addition, Telstra's unit costs are likely to be significantly lower than those of other mobile operators given its ability to recover common costs, such as certain head office costs, across its large volume of fixed and mobile minutes and that, even in relation to the costs of its mobile operation only, Telstra is larger than the other mobile operators. Were the Commission to regulate prices at a unit cost level that only Telstra could obtain, the other operators would be prevented from recovering their costs with a risk of market consolidation and the loss of the dynamic benefits of competition. The harm to dynamic efficiency from a less competitive mobile market would be expected to dwarf any short-term benefit of lower prices in terms of the overall impact on consumer welfare.

The ACCC also has taken into account analysis submitted by another carrier. This study suffers from the general flaws described above in terms of not being designed to identify the incremental costs specifically associated with termination and not applying an economic approach to estimating the efficient level of termination charges such as in relation to depreciation and the recovery of fixed and common costs. Even in terms of estimating the average costs of supplying mobile services, the study has a number of deficiencies.

- It underestimates the major network cost of cell sites and ignores other network costs altogether. As already noted, a similar study, although more comprehensive, undertaken for the European Commission estimated average network costs per minute of A\$0.139 for an urban network and A\$0.480 for a rural network.⁶⁹ Even these estimates exclude some network components, such as racks for MSCs and power generators placed in sites, which the study's authors estimate would add up to 15 per cent of the annualized

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Europe Economics, *Cost structures in Mobile Networks and their Relationship to Prices – Final report for the European Commission*, 28 November 2001, p.98-99.

investment costs of the included network elements.⁷⁰ If we conservatively assume that the additional network elements add 10 per cent to the cost per minute and that equipment costs have been declining at an annual nominal rate of 3.5 per cent since 1998,⁷¹ then the overall network costs per minute in 2004 would be expected to be A\$0.123 for an urban network and A\$0.427 for a rural network.

- It ignores non-network costs altogether. It is efficient for termination to contribute to the costs of managing the business, such as head office support functions. It will also be efficient for termination to make some contribution to the costs of acquiring and retaining customers. Customer acquisition and retention costs are common to all the services associated with the customers, including termination as without customers an operator cannot earn any termination revenues. While two-part tariffs can enable some of these costs to be recovered by way of upfront and monthly charges, particularly for post-paid customers, mobile subscription is not perfectly inelastic (indeed empirically much more elastic than fixed subscription). Thus termination should also contribute to the recovery of these costs so as to maximize overall consumer welfare in line with Ramsey pricing principles.
- It uses a WACC developed in relation to Telstra's USO services with no reasoning provided as to why this should be representative of the cost of capital associated with providing mobile services. CRA has estimated costs of capital for the UK mobile operators that are substantially higher than the estimated cost of capital for BT.⁷²

Summary

We have reviewed the modelling undertaken by the Commission and the model submitted by the other carrier given the limited opportunity available. We believe that there exists strong theoretical reasons and empirical evidence to suggest that these approaches are likely to significantly underestimate the efficient level of termination charges. As such, these approaches are of little value to identify a target level of termination charges that would be in the long-term interests of end-users.

⁷⁰ Ibid, p.99.

⁷¹ 1998 is the year in which the equipment costs in the study are based. An annual rate of decline in costs of 3.5% (separate to the impact of higher volumes) was estimated for the GTE network in the study by R. D. Foreman and E. Beauvais, "Scale Economies in Cellular Telephony: Size Matters", *Journal of Regulatory Economics*, 16 (3): 297-306, November 1999.

⁷² CRA's report is available at http://www.crai.com/pubs/pub_3547.pdf

4. MOBILE RETAIL PRICE BENCHMARKS

The Draft Decision notes that the Commission has had regard to the retail price of on-net mobile-to-mobile calls to infer underlying costs, on the premise that the cost of termination is equal to 50 per cent of an on-net call price.

The premise underlying this analysis is seriously flawed. The supply of mobile services involved substantial fixed and common costs. As with other competitive industries with large fixed and common costs supplying a range of services and customers, firms can be expected to engage in significant price discrimination. As Laffont and Tirole note:

*[Unregulated businesses] indeed engage in sophisticated marketing strategies. The offer discounts to high-elasticity-of-demand customers, adjust their prices to competitive pressure, and carefully coordinate the pricing of substitutes or complements.*⁷³

The fact that mobile operators engage in price discrimination does not imply market power⁷⁴, any more than Virgin Blue or the local cinema or hairdressers could be regarded as having exercise market power because of differences in the prices paid by different customers do not (always) reflect cost differences. The Director General of the UK Office of Fair Trading has acknowledged the compatibility of price discrimination with competition:

*The fact of price discrimination does not by itself allow an inference of market power, still less dominance. There are ample circumstances in which competition and price discrimination are quite consistent.*⁷⁵

The implication of price discrimination is that the price for one particular service may be significantly below the average costs of supplying all services. In the case of on-net prices, part of the explanation may reflect demand-based pricing broadly along Ramsey principles. It should be noted that Ramsey pricing relates to mark-ups over marginal costs and that the marginal cost facing mobile operators of an on-net call is significantly below the marginal cost of off-net calls which also

⁷³ Laffont, J.J. and J. Tirole, *Competition in telecommunications*, The MIT Press, Cambridge, Massachusetts, 2000, p.131-132. See also Levine, Michael E., "Price Discrimination Without Market Power," *Yale Journal on Regulation*, Winter 2002, 19(1), 1-36 and Stavins, J., "Price Discrimination in the Airline Market: The Effect of Market Concentration", *The review of economics and statistics*, Vol. 83, Issue 1 - February 2001, pp. 200-202.

⁷⁴ In rejecting the possibility of pricing around Ramsey levels, the Commission seems to believe that any pricing above attributable (marginal) costs must imply market power (Draft Decision, p.138). The implication of the Commission's view is that in any industry with significant fixed and common costs, firms would be characterised as having market power unless they were making losses, i.e. pricing each product to recover only the unit costs of the product and not making any contribution to fixed and common costs.

⁷⁵ John Vickers, "Competition Policy and Innovation", Speech to the International Competition Policy Conference, Oxford, 27 June 2001.

include interconnection payments. Thus even were on-net and off-net calls to have the same price elasticity of demand, operators would be expected to impose a higher nominal mark-up on off-net calls than on-net calls. Perversely, AAPT and the Commission seem to believe that Ramsey pricing implies that on-net and off-net calls should be priced similarly. In addition, it is possible that if on-net calls are more likely to be made between calling parties who frequently call each other⁷⁶, then customers may be more sensitive to the price of these calls than to off-net call prices. This would further reinforce the likelihood of on-net call prices being discounted.

Separate to demand-based pricing considerations, discounted on-net pricing also arises from the dynamic competition in many mobile and fixed markets. In effect, discounted on-net pricing operates as a form of marketing in which existing customers are given an incentive to encourage their frequent calling parties (e.g. family, friends, and colleagues) on to the same network. Indeed, in many consumer industries, discounts and refunds are paid by companies for 'introducing a friend'.⁷⁷ Laffont and Tirole find that such discounted on-net pricing intensifies competition, while having an ambiguous effect on overall welfare.⁷⁸

The upshot of this discussion of the structure of mobile prices is that on-net call prices are likely to be significantly below the average price of supplying mobile services. Thus were all mobile services to be regulated with reference to the observed retail prices for on-net calls, operators would be unable to recover their overall costs. Such regulation would be as poorly based as regulating all cinema ticket prices on the basis of observed ticket prices for children.

The analysis is also technically flawed in assuming that termination costs should be around 50 per cent of the costs of an on-net call. As discussed in the previous section, the incremental costs of terminating a call are greater than the incremental costs of originating a call. This reflects the need for greater transit in the network on average and the use of additional network components such as the Home Location Register. Moreover, efficiency considerations imply that termination should bear a greater contribution to the recovery of fixed and common costs.

Summary

Based on our understanding of the underlying economics (as discussed above), we are of the view that the use of on-net call prices as a guide to setting the (efficient) level of termination charges will generate termination charges that will be too low.

⁷⁶ See Draft Decision, footnote 8.

⁷⁷ For instance, the Art Gallery of NSW is currently offering gifts for existing members to encourage new members to join (http://www.artgallery.nsw.gov.au/member/introduce_a_friend).

⁷⁸ Laffont, J.J. and J. Tirole, *Competition in telecommunications*, The MIT Press, Cambridge, Massachusetts, 2000, p.202.