

INCENTIVES FOR MOBILE CO-LOCATION PROVISION IN NEW ZEALAND

1. INTRODUCTION

NZ Communications Limited (NZCL) has highlighted in its submissions that the incumbent mobile network owners, Vodafone and Telecom, do not have sufficient incentive to facilitate access to co-location services.¹ As a consequence, NZCL has recommended that regulated pricing of national roaming should be used as a mechanism to reverse the incentives on incumbents to cooperate. NZCL have asked us to evaluate from an economic point-of-view the current incentives of Vodafone and Telecom, and how these would change with national roaming price interventions.

2. CURRENT INCENTIVES TO PROVIDE CO-LOCATION

We consider that a profit-maximising firm in either the position of Vodafone or Telecom would, under current arrangements, have strong incentives to delay the provision of mobile co-location to a new entrant. This is because co-location would lead, via a strengthening of competition, to erosion of the incumbents' market share and margins and, in the case of Vodafone, would cannibalise national roaming revenues. A desire to delay co-location provision may help explain why the NZ co-location protocol is extraordinarily lengthy and why the process to date has been so drawn out.

If one of the incumbent network operators engages in co-location arrangements with NZCL it may expect to receive some capital contribution and opex savings, which is unlikely to exceed \$10 million per annum. The incremental costs incurred in providing the service are likely small, and so most of that would be considered incremental profit. In short, it will receive net revenues of approximately \$10 million per annum.

As a profit-maximising firm, Vodafone would set against these private benefits the opportunity costs of providing co-location. Vodafone presently enjoys approximately 65% of mobile market revenues amounting to around \$1.4 billion per annum.² In providing co-location, its opportunity cost would include:

- national roaming margins foregone as a result of the entrant substituting co-location for national roaming;
- a reduction in retail mobile prices as a consequence of the stronger competition that would result from increased coverage of facilities-based entry – notably where subscriber density implies co-location is efficient; and
- a reduction in market share as a result of stronger competition – with lower costs the entrant would be able to compete more effectively and would also be able to target

¹ For example, see Appendix 2 of NZ Communications Limited, *Submissions to the Commerce Commission in relation to the Draft Standard Terms Determination for the Co-location on Cellular Mobile Transmission Sites Service*, 22 August 2008.

² Vodafone NZ Annual Report 2007.

customers in a broader geographic area. It is likely that national roaming would be used primarily as a way of providing national coverage to customers residing in areas covered by the entrant's own network facilities rather than to serve retail customers nationally. For example, if the entrant's network is limited to Auckland, Wellington and Christchurch, then while the entrant would use national roaming to serve customers from those main cities travelling to, say, Rotorua, it would not seek to connect customers in Rotorua. Thus a substitution from roaming to co-location would increase the proportion of NZ customers that the entrant would actively pursue.

For the purposes of providing a numerical example of the effect on Vodafone's net revenue position we have considered the following scenario:

- the provision of mobile co-location leads to 33% of the entrant's traffic being substituted from national roaming to sites where co-location was used;
- the entrant's market share without mobile co-location would be 5%, increasing to 10% with co-location; and
- mobile prices would fall by somewhere between 5% and 20% as a result of the stronger facilities-based competition that would occur with co-location (see the Appendix A for a discussion of why this range was used);
- the mobile traffic elasticity of demand is 0.55 (the mid-point of the international survey of elasticity estimates contained in Appendix A). This is used to calculate the increase in market size, and the resulting benefit to Vodafone, that results from a price decrease.

On the basis of these assumptions, Vodafone would likely lose between \$100 to \$215 million per annum if co-location was provided. In other words, for every month of delay in supplying co-location, Vodafone would be better off by \$8 million to \$18 million. Clearly, in an unregulated setting it would not be in the interests of Vodafone as a profit-maximising firm to provide co-location. Furthermore, even in a regulated environment it would have an incentive to delay as long as possible provision of the service. For example, even if it were incurring a delay penalty of \$500 per day for, say, 500 cell-sites, leading to a penalty of around \$90 million per annum, the illustrative example above shows that co-location delay would still be the profit-maximising outcome.

If Telecom, were to instead provide NZCL with co-location we again assumed it would achieve up to \$10 million in net revenue. However, its opportunity cost, while not including any national roaming revenues would include:

- reductions in retail mobile prices as a result of stronger competition;
- reductions in mobile market share; and
- lost profit margins from its fixed voice telephony (and potentially broadband) business as a result of the increased fixed-mobile substitution that would occur with a reduction of the ratio of mobile to fixed pricing.

To provide an illustrative example of the effect on Telecom's revenues, we used the same assumptions as above for Vodafone, but in addition assumed that the fixed-mobile elasticity

is 0.1 (ie, for each 10% decrease in the mobile price, the demand for fixed traffic reduces by 1%). We find that Telecom would be \$70 million to \$130 million worse off per year as a result of providing cell site co-location to an entrant, and would gain around \$5 million to \$11 million for every month of co-location delay.

The above discussion assumes that each of Telecom and Vodafone consider that the other would equally delay co-location. This is consistent with the incentives of the parties. The relatively small gains of \$10 million per year are unlikely to motivate either to beat the other in co-location supply, and this is all the more so given the ease with which two long established players are likely to be able to tacitly collude. Moreover, this is consistent with events to date – while Vodafone and NZCL very recently reached an agreement for the provision of co-location on a limited number of cell sites, this only occurred due to the strong threat of regulatory and political intervention.

Clearly the incentives for Vodafone and Telecom to provide co-location are very different from what would be expected in an effectively competitive market. Were competitive forces strong, it would be expected that there would be an efficient combination of:

- separately owned cell-sites – for example, in cases where new cells sites are financial, say, due to demand creating a need for cell-splitting, or where co-location is not possible for technical reasons;
- co-location where it is cheaper to share towers than duplicate them; and
- roaming – for example, in areas that have a low subscriber density.

NZCL has informed us that it estimates around 1/3 of sites would be co-located.

2.1. GOING IT ALONE

Of course, NZCL could go it alone and supply its own towers. Indeed, if it faced no other option it might do this. However, such an approach would be problematic in two respects. First, as just indicated, this would lead, in many locations, to inefficient tower duplication. More importantly, the process required to obtain zoning permits and Resource Management consents, and to physically build towers, is not merely inefficiently expensive, but is also lengthy. As a result, this would at best postpone the benefits of effective competition from NZCL, and at worst, prevent NZCL from successfully entering the market thereby allowing Telecom and Vodafone to continue to earn monopoly rents.

Presumably this explains why access to Telecom and Vodafone's towers for the purpose of co-location has been mandated. The view appears to have been that such regulated access is likely to bring greater benefits to consumers and the New Zealand economy at large, than any regulatory costs of such a policy. While this question is somewhat beyond the scope of this note, it is worth mentioning that regulating access for tower co-location does indeed seem unlikely to carry substantial efficiency losses. There are no complexities in this market, such as vertical (and perhaps even horizontal) economies of scope, unlike the case, for example, of local loop unbundling in the context of next generation networks (where there is a need to make substantial sunk investments with up- and downstream interdependencies). Rather, site sharing occurs the world over, in many cases through purely commercial arrangements. Often the shared towers are not even supplied or owned by mobile carriers. For example, Crown Castle owns, leases or manages around 23,800 towers internationally,

with more than 21,800 in the US, 1,400 in Australia and the remainder in Canada and Puerto Rico.³ American Tower Corporation is another example, having more than 20,000 towers.⁴

It is not even clear that a mobile carrier would typically purchase tower access from a single supplier. For example, in some cases an independent supplier provides a single tower (such as a church steeple). In short, market outcomes elsewhere suggest a high degree of cost separability in the provision of mobile towers, which in turn reduces the extent to which regulatory error is likely to occur.

From a different perspective, the government's decision to impose cellular tower access amounts to a decision that Telecom and Vodafone have limited rights to even obtain short run monopoly profits by virtue of their ownership of cellular towers. In this light, the present difficulties that NZCL is experiencing, which contrast sharply to relatively competitive provision of cellular towers in many other jurisdictions, seems best explained as an attempt on Telecom's and Vodafone's parts to evade the government policy, thereby maintaining monopoly price and the rents that accompany these.

3. IMPACT OF MOBILE NATIONAL ROAMING PRICE REGULATION ON CO-LOCATION INCENTIVES

NZCL has suggested that Telecom's and Vodafone's inefficient incentives to delay co-location could be substantially eliminated by means of a simple policy: a failure to supply co-location at a particular tower in a given timeframe would lead to mobile roaming rates (on the tower supplier's network) being set to short run incremental cost. This would largely eliminate Telecom and Vodafone's incentives to delay co-location, at least beyond the timeframe in which regulated access rates come into effect.

The effect of such a policy would be for NZCL to approach Vodafone for tower access. This is because NZCL uses a GSM technology, and consequently NZCL can only benefit from low cost roaming on Vodafone's network. If Vodafone did not manage to supply co-location at the requested tower within the specified timeframe, NZCL would obtain sharply lower roaming charges in that region. This would both remove the wholesale source of monopoly rents from Vodafone (that is, in roaming), and enable NZCL to effectively compete with Telecom and Vodafone, thus likely also reducing the retail monopoly rents available to those two carriers. As a consequence, delay by Vodafone no longer delivers the same private benefits to Vodafone as it presently does, and so the option of collecting rent for tower space would become much more attractive relative to the alternative.

At the same time, such action would change Telecom's incentives, even though NZCL cannot roam on Telecom's networks. Given that NZCL will either gain co-location access or very cheap roaming rates within a specified time frame, Telecom no longer gains by staying out of the supply of co-location. Whether Telecom stays out or not, within the specified timeframe, NZCL will begin to impose competitive constraints on Telecom (as well as Vodafone). As a result, it becomes optimal for Telecom to compete to supply NZCL tower co-location services, as it might as well obtain some, even if small, wholesale revenues, since it is going to lose its monopoly rents anyway.

³ Crown Castle International Corp, Form 10-K Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the Fiscal Year Ended December 31, 2007.

⁴ <http://www.americantower.com/atcweb>



Such a policy would have to also ensure that NZCL was not provided with perverse incentives. Thus, a carrier that was late in meeting a request for co-location, so was forced to supply roaming to NZCL at short run incremental cost, would be allowed to set commercial roaming rates once co-location was made available. This would, for example, prevent NZCL from asking for co-location in rural areas in the hope that this would be delayed so that it would receive cheap roaming, and then never make use of co-location once it was available.

In summary, the threat of reduced roaming charges largely eliminates the gains from delaying co-location. As a result, this would lead both Telecom and Vodafone to behave more like competing carriers. It would also avoid the need for regulatory oversight of service level achievement and for regulatory enforcement of penalties, thereby reducing regulatory oversight costs, the potential for regulatory gaming, so would further enhance efficiency.

APPENDIX A

Elasticities

Drawing on the international surveys summarised in Table 1, a reasonable elasticity estimate would fall into the range of -0.4 to -0.7. That is, a 10% reduction in the mobile price, would lead to a 4% to 7% increase in traffic volumes. We use the mid-point of this range – that is, 0.55.

Table 1: Summary of elasticities estimates for mobile traffic

Study	Country	Elasticity estimates
Dewenter and Haucap ⁵	Austria	-0.2 for prepaid traffic, -0.67 for postpaid traffic
DotEcon ⁶	UK	-0.62
Holden Pearmain Customer Survey ⁷	UK	-0.48

Price reductions post-entry

To arrive at an estimate of the retail price reductions that may occur after provision of co-location, we consider international evidence of the effect of entry on mobile pricing.

Table 2 contains a summary of the average price for each of the three mobile usage baskets priced by the OECD. It shows that the average price of each basket reduces as the number of competitors increases. On average countries with three mobile networks have prices that are 12%, 6% and 9% cheaper for the low, medium and high usage baskets respectively, than countries that have two mobile networks. Ideally, a weighted average of these would be used, but in the absence of information on appropriate weights, we calculate the percentage change in the mean of the three usage baskets, which is 9%. Given prices in New Zealand are relatively high, this probably understates the price fall that an effective competitor would bring to the New Zealand market.

⁵ Ralf Dewenter and Justus Haucap, *Demand Elasticities for Mobile Telecommunications in Austria*, Ruhr Economic Paper #17.

⁶ DotEcon's study was commissioned by O2. A description is provided in UK Competition Commission (2003), *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*, London, February 2003.

⁷ Commissioned by Vodafone UK. Also described in the UK Competition Commission (2003)

Table 2: Average prices by number of competitors (USD PPP), August 2006

<i>No of competitors</i>	<i>Low usage price</i>	<i>Med usage price</i>	<i>High usage price</i>	<i>Average of basket prices</i>
2	238.39	473.33	803.29	505.00
3	210.49	446.49	729.01	462.00
4	198.45	379.43	606.81	394.90
5	146.86	341.87	467.85	318.86

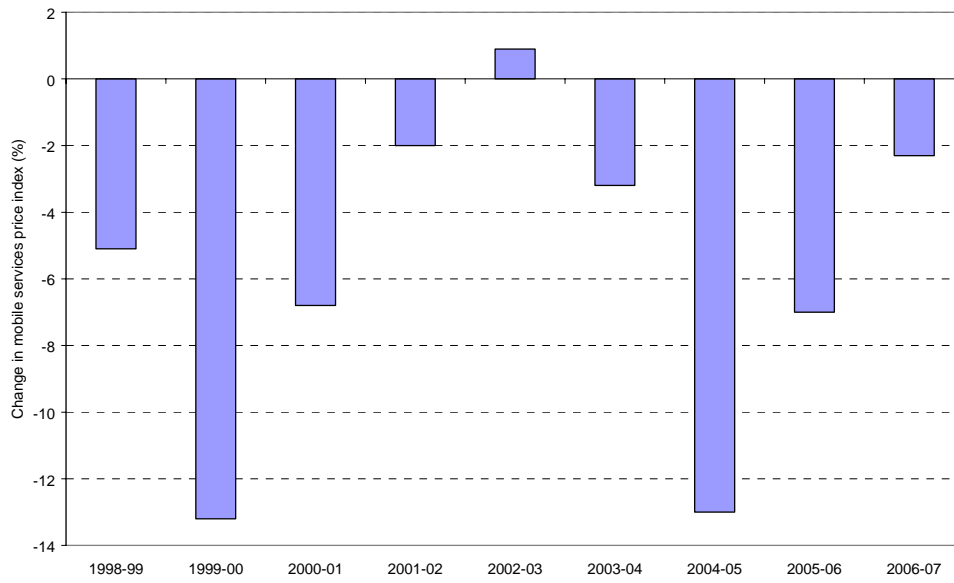
Source: OECD, *Communications Outlook 2007*; Concept Economics analysis

Another approach, which is likely more reliable, is to consider the impact on market prices in countries where new mobile operators have entered the market. In Australia in 2000, Hutchison entered the market as the fourth mobile network operator. Also around late 1999 and early 2000 One.Tel built its own network to compete with the incumbent operators, however One.Tel collapsed in May 2001. The effect of Hutchison's entry (and One.Tel's initial entry) was to reduce mobile charges by 13.2% in 1999-00, the largest annual change in prices over the last decade. Prices fell by a further 7% in 2000-01, before stabilising in 2001-02 (Figure 1). In addition, there were further benefits to consumers in the form of significantly reduced handset pricing that occurred at the time of One.Tel's entry.

A later price decrease of around 13% occurred in 2004-2005 following the launch of the '3' network. The pattern evident in Figure 1 suggests that a large price reduction (that is, in excess of 10%) in the first year of entry is followed by a reduction of a further 6-7% in the second year, and around 2% in the third year. In other words, the total price reduction is around 20%. We note that there were termination charge reductions occurring at the same time.



Figure 1: Changes in Australian mobile prices



Source: ACCC Telecommunications Reports