

Efficient Pricing of National Roaming

John Small May 2007

Vodafone New Zealand is designing tariffs for use of its network by customers of potential rivals. It is envisaged that one or more of these firms will build a partial coverage network in New Zealand, and that its customers will want to roam on Vodafone's network beyond that coverage area.¹

Covec has advised Vodafone that the efficient structure of roaming charges would allow for geographical de-averaging. The purpose of this note is to explain the rationale for that advice.

Construction depends on the roaming charge

The network roll-out plan for an efficient entrant will depend on the level of the roaming charge it faces. In each location, a choice is required between building and renting (ie using the roaming service). The lower the roaming charge in a location, the more likely is the entrant to rent rather than build.

The extent of new network construction also depends on the cost of covering each location relative to expected demand. Densely populated urban areas are therefore likely to be covered by a new network, because costs are relatively low and anticipated demand (and hence revenue) is relatively high. Roaming is most likely to be required in rural locations where there are few resident customers over whom the cost of infrastructure can be shared.

For any roaming charge there will be locations, around the edges of major urban areas and possibly covering smaller towns, where entrants have difficult decisions to make about whether to build or roam. Those locations have the economic characteristics of distinct markets. In those markets, building and roaming are close substitutes.

What the roaming charge should do

The roaming charge has two economic functions. One is to ensure that the pattern of new build is broadly efficient from the perspective of society as a whole. Setting the roaming charge so low that it deters all construction would probably be inefficient, because it would deprive New Zealanders of the competitive and innovation benefits that an additional network would deliver. Conversely, if the charge is too high, it could deter entry altogether: investors might calculate that even with an efficiently scaled network the level of roaming charges would prevent them from covering total costs.

The second function of the roaming charge is to cover the costs of providing the roaming service. Unless that is achieved, roaming will be under-priced and there will be

¹ In-footprint roaming might also occur, but is not explicitly considered in this note.



inefficiently excessive use of the roaming service. This follows from the fundamental and well-understood economic efficiency principle of pricing services at their marginal cost.

Service costs vary with location

The cost attributable to a unit of mobile traffic varies dramatically by location in New Zealand. Many rural cell sites are very lightly used, with the result that the fixed costs associated with the site (which includes the cost of backhaul transmission) are spread across very few units of traffic.² In urban locations, cell sites are much more heavily loaded, so the unit cost of service is lower.

There is a direct analogy here with Telecom's fixed-line network. In some rural locations, the incremental cost of serving a cluster of customers is greater than the total revenues received from them. Those customers are classified as commercially non-viable, and Telecom's rivals are required by law to reimburse it for part of the net cost of service.

It follows that efficient roaming charges would vary with location. Since efficiency requires that prices reflect costs, the roaming charge should be higher in (say) Central Otago than an urban CBD.

One or several roaming charges?

In principle, a single roaming price could be efficient. However, to identify such a price, one would need to adjust the price in response to the extent of new build. Figure 1 shows a stylised network service cost function, which increases as one moves to the right. Suppose the roaming price P^R was posted. The entrant would build out to Q because self-supply would be cheaper than roaming for all of those locations. The roaming price is less than the cost of service for all locations to the right of Q, so the roaming provider would not cover costs.

One might be tempted to increase the price to P^2 following the completion of the entrant's build. This at least has the potential to cover the cost of the roaming service. However the entrant could then complain that it was led into investing through false information.

For this reason, we consider that a more open and transparent approach is to post geographically de-averaged roaming prices. This allows the entrant to build without risk of adverse changes in the terms of roaming.

² This is precisely why we would not expect a new entrant to cover the whole of New Zealand, or indeed to match Vodafone's footprint.





Figure 1 Service costs and roaming charges