

# Vodafone Local Service: TSO and Cost Recovery Issues

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## Summary

We have examined some issues relating to the TSO arising from the Commission's Draft Determination on Vodafone Local Service (VLS). In particular, we have considered several issues raised by CRA on behalf of Telecom. The basic questions addressed here are: how VLS changes the net cost of the TSO, and whether or not this would cause difficulties for the TSO system as a whole or for Telecom in particular. We also look at the likely impact of the TSO on traffic volumes on Telecom's fixed local network, and whether a positive interconnection charge would be preferred to bill and keep.

In summary, we reach the following conclusions:

1. VLS enables Vodafone to compete for providing local access. To the extent that Vodafone attracts some of the 97% of total Telecom customers that are calculated to be viable under the TSO, the design of the TSO means that this particular activity will not change the net cost of the TSO.
2. VLS may result in a reduction in profits that Telecom earns from providing additional value-added services ('supplementary revenue') to its local access customers. This will occur to the extent that it loses profits from providing fixed-to-mobile calls if its local access customers substitute fixed-to-VLS calls for fixed-to-mobile calls. However, the TSO methodology is sufficiently robust to cope with any such reduction in supplementary revenue. In this regard there is no difference between VLS and an increase in competition for any of Telecom's other sources of supplementary revenue (for example, additional competition in the toll calls or ISP markets).
3. If VLS enables Vodafone to attract non-viable customers away from Telecom's access service, the net cost of the TSO may decrease or increase. Therefore, it cannot be argued as a matter of theory alone that VLS will cause the net cost of the TSO to increase. Whether that occurs would need to be determined empirically, and therefore can not be assessed until after the service has launched.
4. VLS is highly unlikely to result in a significant increase in the volume of traffic on Telecom's local network, and may well result in a decrease. If Telecom's local

access customers substitute fixed-to-VLS calls for fixed-to-fixed local calls then one end of such calls is no longer carried on Telecom's local access network, which will cause traffic volumes to decrease. If VLS allows some limited mobility beyond the range of a typical cordless fixed-line phone, or if it allows VLS subscribers to divert incoming calls to their mobile service when they are not at their home location, then it may allow Telecom's local access customers to substitute fixed-to-VLS calls for fixed-to-mobile calls. Since the price of fixed-to-VLS calls will be much lower than the price of fixed-to-mobile calls, the volume of such calls will probably increase if VLS allows mobility and/or if the price that VLS subscribers pay for diversion is not too high. However, again only one end of such calls will be carried on Telecom's local access network. Overall, the volume of calls made by those local access customers remaining on Telecom's network would need to increase by more than double to generate an increase in traffic on Telecom's local access network.

5. From a TSO perspective, we see no particular reason to favour positive cost-based interconnection charges over bill and keep. Having a positive interconnection charge would cause the net cost of the TSO to vary depending on the relative traffic flows between Telecom's local access network and VLS. Depending on the direction of any traffic imbalance, a positive interconnection charge may increase or decrease the net cost of the TSO relative to bill and keep. We do not see any reason why this would be preferred, and any such effect is likely to be small.
6. It would be poor public policy to allow TSO-related arguments to stand in the way of introducing competition in local access. The potential welfare gains from such competition are large, and the TSO is robust enough to deal with this change in a sensible manner.

## Introduction

The Commission's Draft Determination on Vodafone Local Service (VLS) precludes Telecom from treating calls to Vodafone local numbers any differently to calls to other local numbers, such as those on TelstraClear's network. Under this arrangement, no calls to local numbers originating from Telecom's residential customers will attract a per-minute price, which is consistent with the provisions of the TSO.

In a report for Telecom, CRA advance several arguments about this outcome:

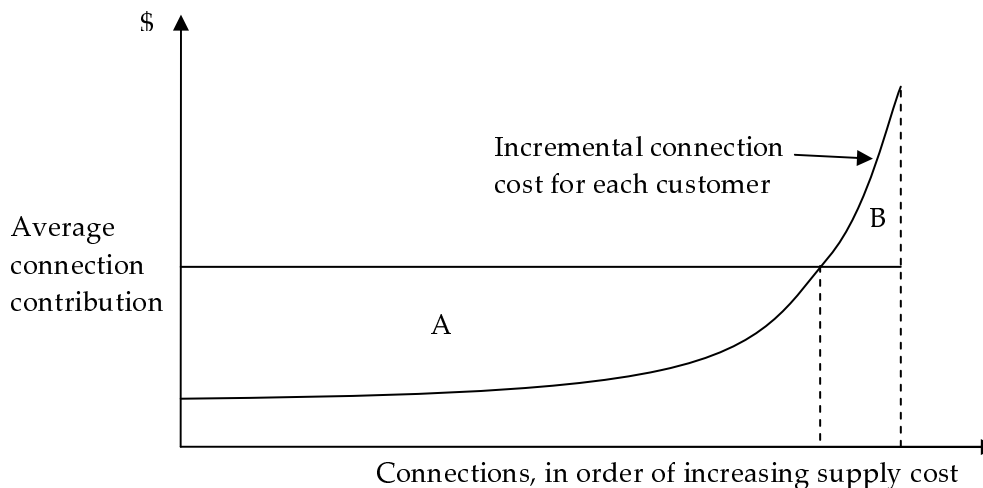
1. It could compromise efficient cost recovery if VLS leads to a substantial increase in fixed local access network traffic;
2. Telecom will lose some of the contribution to common costs that is currently provided through a margin on fixed-to-mobile calls;
3. The Commission needs to explain how it expects Telecom, as a regulated business, to recover that lost contribution;
4. Commercially non-viable customers are the source of some of the lost contribution, so the net cost of the TSO will increase;

5. A positive cost-based interconnection charge would be superior to bill and keep; and
6. The Commission should consider the implications of VLS for the whole TSO regime and the assumptions on which it is based.

Vodafone have asked us to respond to these points. We begin with a brief review of the design of the TSO cost methodology. We then analyse the way VLS could affect the net cost of the TSO, thereby addressing CRA's arguments 2 to 4 inclusive. We then address points 1 and 5. CRA's last point is covered by our conclusion.

### The Net Cost of the TSO

In considering these points, the basic design of the TSO should be borne in mind. The net cost of the TSO is essentially defined as the net loss incurred on customers who were connected to Telecom's network at 20 December 2001 that are not commercially viable on an incremental basis, which is area B in Figure 1.<sup>1</sup> These are customers for whom the incremental cost of a connection and local calls exceed the revenue from line rental plus profits that they generate on other services ('supplementary revenue'). Because the TSO is a constraint on the pricing of basic access to all residential customers, a natural alternative definition of the net cost is the total access service loss across all customers. This is the difference between access profits and access losses across all customers, defined as B-A in Figure 1.<sup>2</sup>



**Figure 1** Net Cost of the TSO

<sup>1</sup> It is our understanding that the Commission's modelling of the TSO net cost fixes the demand for local access at the number of consumers who were connected at 20 December 2001. If a large number of customers switch to VLS or other competing local access services, this input to the model would need to be revised.

<sup>2</sup> In practice area A is greater than area B, so overall there would be no net cost of the TSO with this definition.

For the vast majority of customers, line rental revenues plus the margin on higher value services are sufficient to cover the cost of providing access and local calling. These customers lie to the left of the intersection between the two lines in Figure 1: they are commercially viable. In the latest TSO estimates, almost 54,000 residential customers are estimated to be commercially non-viable.<sup>3</sup> This represents about 3% of total fixed line connections at 30 June 2005.<sup>4</sup>

In Figure 1, the profit in area A comes from two sources. First, for some customers the line rental that they pay will exceed the cost of providing access and local calls to those customers. In addition to this, there is the profit made from selling related value-added services to these customers. An important reason for defining the TSO net cost as area B rather than B-A was that competition in providing local access to viable customers was expected to erode the former source of profit over time. Under the definition adopted, this activity does not affect the net cost of the TSO, and the structure of the TSO therefore promotes competition for providing local access to customers for which line rentals exceed the cost of providing access and local calls.<sup>5</sup>

It was also recognised that the TSO net cost would increase if competition eroded Telecom's profits from the sale of value-added services. There are two reasons for this. First, customers who were already non-viable will generate less profit from value-added services to offset the cost of providing access and local calls to them. Second, some customers who were previously viable may become non-viable.

### **Impact of VLS on the TSO Net Cost**

These observations make it relatively easy to examine the impact of the VLS on the TSO. VLS enables Vodafone to compete for providing local access. If, as a result of such competition, Vodafone takes a viable customer from Telecom, there will generally be no impact on the net cost of the TSO. There are two conditions under which competition due to VLS will cause the net cost of the TSO to change:

1. If Vodafone takes a non-viable customer from Telecom.
2. If competition reduces the margin Telecom earns from selling related value-added services.

Let us consider each of these possibilities in turn. First, suppose that VLS enables Vodafone to take a non-viable customer from Telecom. The net cost of the TSO will

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<sup>3</sup> Draft Determination for TSO Instrument for Local Residential Service for period between 1 July 2003 and 30 June 2004, Commerce Commission, 23 December 2005.

<sup>4</sup> <http://www.telecom.co.nz/content/0,8748,200650-1548,00.html>

<sup>5</sup> The net cost of the TSO does not change when a competitor takes a viable customer from Telecom provided that this customer's switching does not result in the cluster that they belong to becoming non-viable.

reduce by the amount of incremental costs associated with serving that customer, and will increase by the amount of revenue generated by that customer. Provided that removal of the customer does not tip a cluster from being non-viable to being viable, the fixed costs associated with the cluster will remain unchanged. Overall, the net cost of the TSO may increase or decrease depending on whether the revenues from the customer are greater or less than the incremental costs associated with that customer.

Now suppose that competition due to VLS reduces the margin (supplementary revenue) that Telecom earns from selling related value-added services. As explained above, this could increase the net cost of the TSO both by increasing the net cost to serve existing non-viable customers, and by increasing the number of non-viable customers. This effect appears to be the primary focus of CRA's concern. In particular, it is concerned that the total profit that Telecom makes on fixed-to-mobile calls will reduce, as some calls that were formerly fixed-to-mobile will become fixed-to-VLS. Since such calls must be priced the same as other local calls, some fixed-to-mobile profits will disappear.

In examining the impact of this reduction in fixed-to-mobile margins on the net cost of the TSO, it is helpful to separate the inframarginal and marginal effects. The inframarginal effect is the reduction in fixed-to-mobile profits made from *existing* non-viable customers. This will occur to the extent that non-viable customers substitute fixed-to-VLS calls for fixed-to-mobile calls. It is important to realise that such substitution will only be possible if the non-viable customer and the VLS subscriber are located in the same local calling area. Because of the mobile price cap embedded in the TSO costing methodology, it is likely that many subscribers to the VLS will be customers that are commercially viable.<sup>6</sup> In addition, some of the substitution by existing non-viable customers away from fixed-to-mobile calls will be towards national toll calls, rather than to fixed-to-VLS calls. Since national toll calls still attract significant profit margins, the reduction in supplementary revenue caused by such substitution will not equal the full extent of the lost supplementary revenue from fixed-to-mobile calls.

The marginal effect is more difficult to assess. This is the increase in the net cost of the TSO caused by an increase in the number of non-viable customers when profits (supplementary revenues) from providing fixed-to-mobile calls to all fixed-line customers reduce.<sup>7</sup> Overall, we believe that this effect is unlikely to lead to a large increase in the net cost of the TSO, as fixed-to-mobile margins are only one component of many that make up the total margin to offset the cost of connecting an individual

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<sup>6</sup> If the VLS service is sufficiently attractive to any customer that they un-subscribe from the fixed-line service, then that customer has revealed themselves to not be in the set of commercially non-viable customers.

<sup>7</sup> In theory, there is a second source of a marginal effect. If VLS causes some customers in an "almost non-viable" cluster to defect from the fixed network, the costs common to that cluster may not be covered by revenues from its remaining members, tipping the balance of the cluster into the non-viable category. In reality however, the boundaries of clusters will change as households defect from the fixed network, so in at least some of these cases the remaining users will be aggregated into one or more clusters that remain commercially viable.

customer. In any case, there is nothing special about VLS that makes this effect more serious than what would be caused by new competition for any of the services for which Telecom earns supplementary revenue. For example, increased competition in the toll calls market will reduce supplementary revenue from toll calls, which could increase the number of non-viable customers and increase the net cost of the TSO. Such effects are easily accommodated within the existing TSO framework, and there is no additional cause for concern created by VLS.

In addition, as pointed out above, the VLS may well decrease the number of non-viable customers if it results in Vodafone attracting such customers onto its network. This may occur in areas where cellular technology is more efficient at connecting customers compared to fixed-line customers. From a TSO cost modelling perspective, VLS has the advantage, in some locations at least, of providing an opportunity to test the accuracy of the mobile price cap, which at this point is based on an estimate. If VLS turns out to be attractive to CNVCs, it would suggest that the mobile price cap is set at too high a level.<sup>8</sup>

In summary, we see no reason to believe that the VLS as it currently stands causes a major concern for the net cost of the TSO. It is true that VLS may cause the net cost to increase or decrease slightly. However the methodology for calculating the net cost is sufficiently robust to cope with such changes. Moreover, the design of the TSO fully anticipated the fact that it would stimulate competition for providing access services to commercially viable customers, and that competition for supplying value-added services to non-viable customers could increase the net cost of the TSO.

### The Cost of Additional Fixed Network Traffic

CRA argue (page 5) that the use of bill-and-keep as an interconnection pricing principle could affect Telecom's ability to efficiently recover costs "if VLS results over time in a substantial increase in call traffic passing through the fixed wire local access network". We find it difficult to envisage a situation in which this condition would be met.

VLS seems likely to affect traffic through Telecom's fixed wire local access network in two ways:

- **A subscription effect** - Some users will un-subscribe from Telecom's local service; and
- **A usage effect** - Telecom's remaining fixed-line customers will, to some extent, increase the volume of calls that they originate.

The first impact unambiguously removes traffic from Telecom's network. The outgoing segments of all calls previously made by Telecom's fixed-line customers who switch to VLS will not travel on Telecom's network. It seems unlikely that customers will generally multi-home in this environment (i.e. take VLS and retain Telecom's local

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<sup>8</sup> The converse does not apply however, one reason being the lack of mobile coverage for some commercially non-viable clusters.

service). In that case, the subscription effect is the primary impact: without it, the usage effect would not occur because there would be no VLS customers to call.

To understand the usage effect, we must first realise that fixed-to-VLS calls are potential substitutes for both fixed-to-mobile calls and fixed-to-fixed local calls. Substitution of fixed-to-VLS for fixed-to-mobile will be possible if the design of VLS makes it possible to call people who are within a given radius of their home location. For example, it may be possible to make a fixed-to-VLS call to reach someone who is not at their house but who is visiting their local dairy nearby. Such substitution may also occur if VLS subscribers have the option to divert incoming VLS calls to their mobile service when they are not at their home location.

If VLS allows some mobility or diversion then VLS effectively makes it cheaper for a fixed-line customer of Telecom to contact a person who is not at their home location (and thus would not be reachable on a fixed-to-fixed local call) but who is relatively close to their home. We would therefore expect the quantity of such calls to increase.<sup>9</sup> Although the volume of fixed-to-mobile calls will decrease, we expect that this would be more than offset by the increase in the volume of fixed-to-VLS calls, due to the large price difference. This substitution may therefore cause an increase in the amount of traffic originated by Telecom's fixed-line subscribers. However, it is important to realise that only one end of such calls will be handled on Telecom's network, with the other end being handled on Vodafone's network. Therefore, the volume of calls from Telecom fixed-line subscribers to VLS subscribers who are not at home but who are near their home would need to increase by more than double in order for this effect to increase the total traffic on Telecom's fixed local network.

Fixed-to-VLS calls are also a substitute for fixed-to-fixed local calls in the case that the VLS subscriber is at home, but there is no price differential between these two types of call. We would therefore expect that there would be no change in the volume of such calls originated by Telecom's fixed-line subscribers. In addition, only one end of these calls would be carried on Telecom's network, thus the overall volume on Telecom's network would decrease.

To summarise, traffic through Telecom's fixed local access network will

- Fall by the amount of outgoing traffic previously generated by customers who switch to VLS; and
- Increase to the extent that VLS stimulates more call activity overall, provided that the increased call activity is large enough to outweigh the fact that only one end of fixed-to-VLS calls are carried on Telecom's fixed local network.

It seems unlikely that the aggregate effect will be a significant increase in the total volume of traffic on Telecom's fixed local network. To get a better feel for the magnitudes involved in these effects, assume that VLS attracts customers with approximately balanced calling patterns – i.e. their incoming and outgoing calls are of a

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<sup>9</sup> In the case of diverted calls, the volume of such calls will also depend on the price that the VLS subscriber has to pay for the diversion service.

similar volume. Since calls to these people are the only ones to which the usage effect applies, we can deduce that in order for CRA's condition to apply, the incoming traffic received by these customers, from remaining Telecom customers, would need to more than double as a result of them taking VLS. Otherwise, the lost outgoing traffic from the subscription effect would dominate the additional incoming traffic from the usage effect. We think that a usage effect of this scale is implausible.

## **Effects on the TSO of Bill and Keep versus Positive Interconnection Charges**

We have also considered the effect on the net cost of the TSO of having a positive cost-based interconnection charge (such as the 1 cent per minute charge proposed by CRA) instead of the bill and keep system recommended by the Commission in its draft report. In general, from the perspective of the TSO, there seems to be no particular reason to favour a small positive interconnection charge over bill and keep. A positive interconnection charge would mean that, if there was a traffic imbalance between VLS and Telecom's local access network, the net cost of the TSO would increase or decrease by the amount of the resulting net interconnection payment.

For example, if traffic is unbalanced so that VLS subscribers receive proportionately more local calls than they make, Telecom will make a net interconnection payment to Vodafone. This will increase the total cost of providing local access and therefore increase the net cost of the TSO. Similarly, if traffic is unbalanced in the reverse direction, Vodafone will pay Telecom and the net cost of the TSO will decrease. If traffic flows are balanced, there will be no net interconnection payment and the net cost of the TSO would be the same as under bill and keep.

In our opinion, there is no advantage to having the net cost of the TSO linked to any relative traffic imbalance between Telecom's local access network and VLS. Furthermore, a cost-based interconnection charge will mean that any effects of a traffic imbalance on the net cost of the TSO are likely to be very small. Therefore, from a TSO perspective we cannot see any reason why a cost-based interconnection charge would be superior to bill and keep.

## **Conclusion**

Based on the analysis above, we consider that VLS will have only a minor impact on the net cost of the TSO. The number of non-viable customers and the net cost of the TSO vary from year to year as a result of a wide range of factors. Some of these are exogenous (e.g. the market risk premium) while others are related to competition between carriers. VLS will join the long list of competitive initiatives that erode Telecom's profit on supplying additional services to non-viable customers.

Regarding the impact on Telecom's ability to recover its costs, we find that it is unlikely that VLS will result in a substantial increase in traffic volumes and costs on Telecom's

fixed local access network. We also find that there is no reason from a TSO perspective to favour positive cost-based interconnection charges over bill and keep.

In our view, it would be very poor public policy to allow TSO-related arguments to stand in the way of new competitive initiatives. The TSO is already an imperfect instrument. It would be much worse if it was used to forestall innovative competition.