

## Memo

To: Airihi Mahuika, Telecom  
Date: 21 August 2009  
From: James Mellsop and Kevin Counsell  
Subject: MTAS: "Backwards Engineering" of the Average Retail On-Net Price

The Commerce Commission has advised Telecom that it intends to reclassify previously Commission Only Information as public information. In particular, the Commission is reclassifying as public the information in Table 49, paragraph 763, paragraph 800, and Appendix A of the Commission's Draft MTAS Report.

The focus of this memo is on the average retail on-net price for mobile-to-mobile (MTM) voice services in Table 49 (although our analysis applies equally to the average retail off-net price for voice, and the average retail on-net and off-net prices for SMS). You have asked us to outline how, if this information is made public, it could be "backwards engineered" by either Vodafone or Telecom to determine the other party's revenue and volume information.

The average retail on-net price for voice services is calculated by the following equation:

Average retail on-net price

$$= (\text{Vodafone retail MTM on-net revenues} + \text{Telecom retail MTM on-net revenues}) / (\text{Vodafone MTM on-net volumes} + \text{Telecom MTM on-net volumes})$$

$$= \mathbf{COI[ ]} \text{ cents per minute}$$

We note that Vodafone's data appears to have been updated since the Commission issued its Draft Report. Using Vodafone's updated data and the above equation, we find that the average retail on-net price is now **COI[ ]** cents per minute.

We set out here how Telecom could use this information to backwards engineer Vodafone's on-net revenue and volume information (although our analysis applies equally to how Vodafone could backwards engineer Telecom's information).

Telecom has information on its own MTM on-net revenues and volumes. Based on the data submitted to the Commission, Telecom's on-net revenue in 2008 was **TRI[ ]** while its on-net volume was **TRI[ ]** actual minutes. Telecom therefore knows two of the pieces of information in the equation above, but there are two further "unknowns" (Vodafone's revenue and volume).

A single equation cannot be solved to determine two unknowns, so there is no way (other than by luck) for Telecom to get an *exact* estimate of Vodafone's revenue and volume.

However, Telecom can make some assumptions and determine an approximation of Vodafone's revenue and volume. For example, Telecom could make an assumption as to the market share of Telecom and Vodafone by on-net revenues. We understand that Telecom's current estimate of its market share by total (on-net and off-net) revenues is **TCOI**[ ], although we are informed also that Telecom has what it believes is very accurate market share information on a regional basis. If Telecom applied this market share to on-net revenues, and knowing its own on-net revenues of **TRI**[ ], it could estimate Vodafone's on-net revenues to be **TCOI**[ ]. Note that Vodafone's actual on-net revenues are **VRI**[ ].

Using this estimate of Vodafone's on-net revenues, Telecom could now use the equation above and the information made public by the Commission to estimate Vodafone's on-net volumes. Using the updated average on-net price of **COI**[ ]cpm as noted above, Vodafone's on-net volumes are estimated as **TCOI**[ ]. Note that Vodafone's actual on-net volumes are **VRI**[ ]. Having estimated Vodafone's on-net revenues and volumes, Telecom could also estimate an average on-net price for Vodafone of **TCOI**[ ]cpm, while Vodafone's actual average on-net price is **VRI**[ ]cpm using its updated information.

There may be other ways to backwards engineer this information. For example, Telecom could make an assumption as to the market share by volume to determine Vodafone's on-net volumes, and then use the above equation and the release of the average on-net price to backwards engineer the on-net revenues. The more accurate the assumption as to revenue or volume market share is, the more accurate will be Telecom's estimate of Vodafone's revenue and volume information.

Finally we note that backwards engineering in this manner could only be done by Telecom or Vodafone. Aside from knowing the average retail on-net price across both Telecom and Vodafone (which may or may not be meaningful to a third party), a third party could not derive any Telecom or Vodafone data from the release of the information, as it would now involve solving a single equation with four "unknowns".