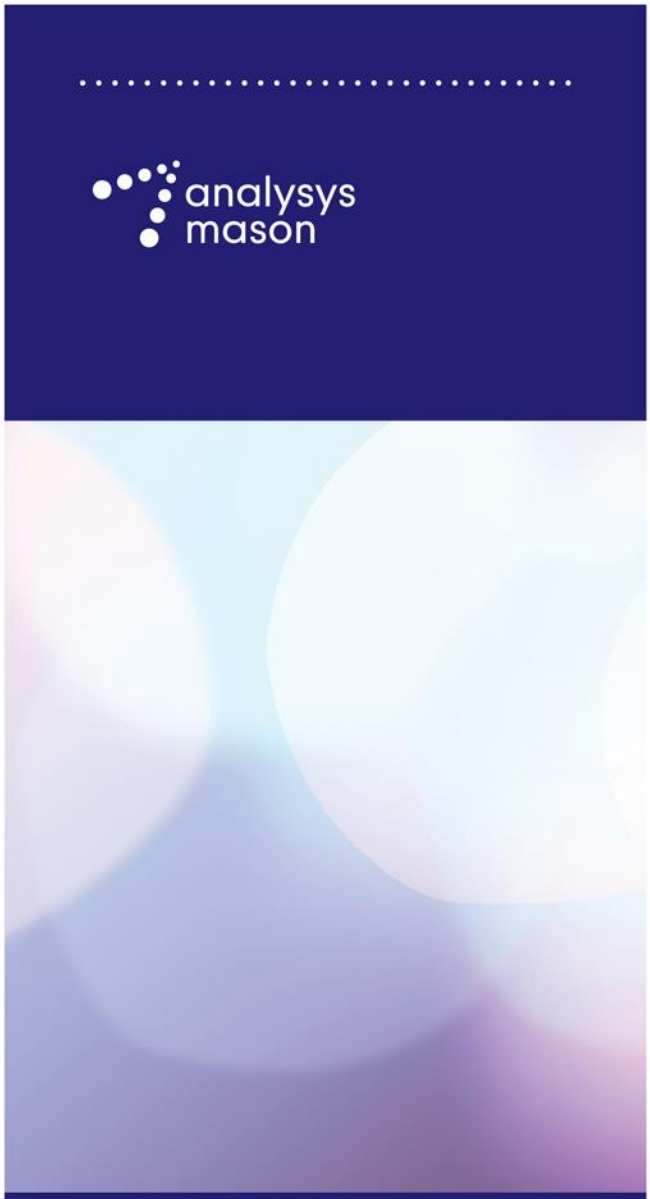

Report for Chorus

Response to submissions on Commission consultation on regulatory framework and modelling approach for UCLL and UBA

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1 Response to specific issues raised in submissions

As a result of requests from industry parties, the New Zealand Commerce Commission (NZCC) ("the Commission") is currently engaged in a process to set the price of unbundled copper local loop (UCLL) using the final pricing principle (FPP). At the same time, the Commission is also engaged in a process to set the price of unbundled bitstream access (UBA) using FPP.

This document has been written by Analysys Mason for Chorus, and is in response to the stakeholder submissions on the Commission's July consultation paper.[1]

The remainder of this document is divided into a number of sections which cover the following specific issues:

- trenching cost
- FWA
- the nodes to retain in the proposed approach
- whether to model the entire network, or use a sampling approach
- sharing of costs with other providers
- Ofcom
- "reusable assets that will not be replaced"
- RAB approaches

1.1 How should the Commission cost trenching?

WIK and NSL have both argued for a detailed approach using a (incomplete) soil/rock national database to identify areas of difficult or easy trenching conditions.

What is important is that the trenching costs applied are realistic when used in the model.

Ultimately, a cost per m based on a (distance weighted) average of conditions is required (i.e. calculate the average cost of trenching where trench is used, etc). Using the average prices per m currently charged for works by different contractors in different areas of New Zealand is a practical solution which does not require the detailed input data set and works directly with the quantity of interest (cost per m of trench) rather than a proxy (soil type) that needs converting to a unit cost.

The proposed approach of using the proposed soil database may be of interest, but it is also likely to be slightly more time consuming (or require additional effort from TERA).

If the suggested input database is incomplete, then its usability also depends on the extent of the incompleteness and any likely bias resulting from its partial coverage.

[1] New Zealand Commerce Commission 9 July 2014 *"Consultation paper outlining our proposed view on regulatory framework and modelling approach for UBA and UCLL services"*

1.2 Should FWA be included in the copper or fibre model?

Our position is that the MEA is the technology that meets the required service specification at the lowest overall cost[2].

If wireless can meet the specification (and we say that it cannot meet the UCLL specification at all, and that in addition to being incompatible with the FPP it is very unlikely to be able to provide the level of coverage and throughput required for UBA at an economic price) then it would be consistent to allow the choice of technology deployed to be made on the basis of the lowest cost solution in each area.

1.2.1 Wireless cannot meet the specification for UCLL

It is an error to believe that a layer 2 service (like UBA) can provide a layer 1 service (like SLU, NC-UCLL and UCLFS). If the Commission believes that its proposed approach of modelling the use of wireless to provide UCLL has a precedent in Sweden, then it is mistaken. We have previously presented evidence that, and TERA note that, PTS expressly limit the use of wireless in their model to "low density areas where only voice or low capacity leased lines are provided and where high speed services are unlikely to be offered in the foreseeable future". The illustration of the wireless model outputs given by Network Strategies for exchanges falling in geotype 4 is therefore inappropriate because PTS has chosen not to use these model results.

In the areas in which wireless technology is currently used, Chorus does not provide UCLL

As we have previously discussed[3], and as WIK has noted, a very small fraction of New Zealand households are provided with voice services using fixed wireless technology (e.g. "country sets" serving approximately 800 lines). However this does not mean that UCLL or UBA are provided to these customers nor that there is a precedent set by this in relation to UCLL.

Network Strategies mentions Spain, in which "Around 148 000 services in very remote areas in Spain are delivered via radio access (TRAC). In CMT's model these lines are excluded from the demand for copper and fibre and are thus not included in the estimation of costs for unbundled local loop." A similar approach would be possible for UCLL in New Zealand: customers served by country sets could be excluded from both the demand and the costs. However, to adopt this approach would be to break the current link between UCLL, UCLFS and baseband remote pricing - as baseband remote does serve these lines and would need to include these costs.

[2] See for example our clear statement in the Analysys Mason submission on the UCLL process and issues paper: *"We agree with this approach: the MEA for a hypothetical new entrant operator is the currently deployable solution meeting the required specification/service set which has the lowest forward-looking cost (i.e. is cheapest in NPV terms)."*

[3] Section 1.4.2 of the Analysys Mason submission on the UCLL process and issues paper

1.2.2 In addition to being incompatible with the FPP, wireless cannot economically provide the level of coverage and throughput required for UBA

As noted in section 1.3 below, propagation factors (and in particular terrain) means that wireless systems struggle to cover 100% of households/premises, which is the desired level of coverage of the UCLL network.

Further, the capacity of fixed wireless systems is limited. This is illustrated by figure 12 of the TERA report; the RBI service provides markedly less monthly throughput than UBA, meaning that for a similar retail price the monthly usage cap is 15GB compared to 80GB on wireline networks.

This will remain so even when upgrades are available, making wireless inadequate if trying to deliver high throughput products suitable for streaming video such as Boost. The NBN Fixed Wireless and Satellite review[4] states:

> For Option 2, NBN Co needs to consider attainable speed and upgrade path. Today, fixed wireless can deliver reliable broadband speeds of 25Mbps. In the future, NBN Co has the option of using carrier aggregation to achieve speeds of 50Mbps. However, in contrast to fixed line premises, fixed wireless end-users would likely be on capped plans.

The limited access network capacity leading to the "cap" needed by wireless products is in stark contrast to UCLL, where there is no cap on usage; unbundlers (UCLL access seekers) can use their electronics at peak speed continuously if they so wish.

1.3 If FWA were included, how should the Commission model FWA?

We understand that the wireline cost modelling approach of TERA is a constructive method that builds trench (or poles) and cable along the shortest road path from each served premise to the MDF location. In this way the user of the model can be relatively certain that the asset count is sufficient: it would be possible to build this network and it would connect all the end points.

Wireless propagation is uncertain: it is affected by a number of factors including the terrain between the transmitter and receiver (notably the height of the terrain), the height of the transmitter and receiver, the wavelength used, and the weather. The propagation models used by wireless operators for planning purposes (e.g. "Okamura-Hata") are approximations predicting statistical quantities (such as mean path loss). Beyond propagation, wireless system performance also depends on characteristics such as the chosen system (e.g. HSPA or LTE), antenna characteristics and orientation, transmit power, and interference from other users in the same and neighbouring bands. As a result of these characteristics, wireless networks are often designed by mobile operators so as to cover large areas of terrain with some probability of coverage (for example, 90% probability of outdoor coverage). They are much less economic if it is desired to provide service at *every* required location: many more base stations are needed to fill in the "holes" in the coverage caused by terrain and buildings. As a result, commercial

[4] http://www.nbnco.com.au/content/dam/nbnco/documents/NBNCo_Fixed_Wireless_and_Satellite_Review_07052014.pdf

mobile operators do not seek 100% coverage; and the RBI is no different, seeking to cover 80% of households/premises in Zone 4. Commercial mobile networks also often tolerate lower performance (in terms of peak speed or throughput) for users at the cell edge.

It is true that fixed wireless networks can use features not available in mobile networks, including roof-mounted antennas for the end user sites which can be pointed directly at the base station. However, these cannot make wireless signals propagate through solid hills, and make the network planning less flexible (it is not trivial to re-point the antennas), and the net effect is still the same: wireless networks are considerably more expensive to build if trying to reach 100% coverage in a given area and if designing the network to provide a high throughput.

As the fixed wireless and satellite review of the Australian NBN has noted:

> NBN Co's fixed wireless network uses TD-LTE technology, with current specifications designed for the 2.3GHz spectrum band. To completely cover a geographic area, NBN Co needs more towers than a notional radius and typical mobile network operator (MNO) grid suggest because although towers have a theoretical range of ~14km, line-of-sight (LOS) is required to all premises. On average, each tower is only able to reach about 20 percent of the area within that 14km radius. The specific location of towers is a critical decision and moving them as little as a few hundred metres can make a large difference to the number of premises they can reach.

This point about the specific location of towers is critical: the only way to provide a wireless model with even a similar level of fidelity to the TERA wireline approach is to model the propagation (with a fine grained grid of clutter and height information) from actual proposed base station locations to actual proposed service locations, to understand whether the locations can be served or not.

We agree with Network Strategies that the "wireless cap" approach of applying a maximum cost per line on a cluster basis based on an average cost is an inadequate way to estimate the impact of using wireless technologies. A geotype (or "zone") based approach such as that used in Sweden would only have merit if the key parameters (such as the cell radius) were to be calibrated based on the results of such sited propagation calculations including the effects of terrain and site placement in geographically similar areas.

1.3.1 If used, wireless will require a fall-back

In practice, even if a large number of base stations were constructed, there will still be some small number of end user sites that cannot be reached economically by wireless means. It is therefore likely to be required to use an alternative technology such as satellite for a small proportion of the proposed wireless-served sites. The subsidised Irish rural broadband scheme (providing a retail broadband service) uses satellite for a small percentage (5%) of its targeted user base (the most rural 10% of premises in Ireland); the Australian NBN plans to use satellite for approximately 3-4% of Australian premises (most of whom will be outside the proposed wireless coverage areas, but some of whom could be inside- this is called "service qualification failure" by the NBNCo).

As noted by TERA, satellite systems using a satellite path for both upstream and downstream connections are very expensive.

This fall back technology would also have to meet the service requirements (or using the Commission's language, "core functionality").

1.4 Degree of scorching

WIK (in paragraph 27 of their submission) suggest:

> We propose that the model to be developed provides the flexibility to allow for efficiency improvements due to incrementally changing the number of ODFs, the efficient placement of cabinets in the case of the reference copper network architecture and for efficient local access areas at a given number of ODF nodes.

We have already stated in our submission on the UCLL process and issues paper[5] that it is possible to justify rationalisation of MDF nodes that are within a very short distance (e.g. 250m). However, the "modification" in "Modified scorched node" usually refers only to the changing of the function of the node (e.g. a concentrator could be deployed rather than a switch).

ODTR (now ComReg) in Ireland puts it very clearly[6]:

> The modified scorched node approach is thus a hybrid between a scorched earth and scorched node approach. It takes the existing node location as given (and thus recognises the historical evolution of the network), but optimises the equipment at the nodes, as well as optimising the transmission equipment connecting these nodes.

The FCC summarises the practices of other regulators and reaches a similar conclusion in practice (though calling it "scorched node") in its 2004 principles paper in paragraphs 57-68[7].

By seeking to significantly modify the number and location of ODFs (and to redefine the areas served) WIK are proposing not a modified scorched node but a scorched earth approach. By comparison, other regulators have generally retained the vast majority of MDF sites and their serving areas in their models.

1.5 The Commission should retain the locations of the MDF sites and the cabinets

As we have already noted[8], retaining the locations of both the MDF sites and the cabinets can be justified as retaining the points of interconnection. Allowing the modelled network to have fewer (or more) MDFs is to change the boundary between the access network and the core; as a result the nature of what

[5] Analysys Mason Report for Chorus Response to Commission 12 Feb 2014 Section 1.8.3

[6] The Development of Long Run Incremental Costing for Interconnection Consultation Paper Document No. ODTR 99/17 http://www.comreg.ie/_fileupload/publications/odtr9917.pdf

[7] http://apps.fcc.gov/ecfs/document/view?id=6520189247

[8] See for example our cross-submission on the UBA issues paper, p3

is being purchased by unbundlers would also be changed (e.g. the "last mile" would become the "last half mile").

Retaining these locations is also highly pragmatic. In addition to the computational expense, reoptimising the choice of MDF locations and served areas:

- Makes certain parameter choices even less realistic (e.g. need for a large scale migration exercise to move to a new serving site means assuming immediate levels of existing demand can be achieved is impossible)
- Makes sampling approaches less feasible (at the very least, all MDFs would have to be relocated and new serving areas defined, and statistics on the new sites gathered).

1.6 Should the Commission model the entire network, or should it use a sampling approach?

WIK suggests at paragraph 94 that the Commission should avoid sampling if a full data basis is available.

We agree that a "census" approach based on modelling the entire network is superior to one based on a sample (because the statistical error induced by sampling is not present), but we note that it may be more expensive and possibly also more time consuming in practice (depending on the extent to which the actual modelling of each area can be performed in parallel). In other words this is a question of degree: is the superiority worthwhile?

We understand that BNetzA and CMT used a census-based approach. However, we note that other regulators including DBA, ACCC and NPT have used sample-based approaches.

If the Commission is however intending to use a sample, we would appreciate the opportunity to comment on the selected sample locations and the means by which the sample was selected before considerable effort is expended on modelling the access network in those areas. In particular this will enable us to consider modelling the same geographic locations.

1.7 Sharing of costs with other providers

If the Commission does model UFB and copper separately, we have proposed that costs should be shared between the two networks on the basis of the number of customers. This is consistent with the discussion of WIK.

1.8 Ofcom is not an example of a dual-valuation TSLRIC based on reusable assets that will not be replaced

In paragraph 18 WIK raises the fact that Ofcom uses a different valuation approach for some assets.

Ofcom uses a method for costing LLU and WLR which is a fully allocated cost (FAC) based on a current cost accounting (CCA) approach. It is not TSLRIC or indeed any other form of LRIC. It uses a RAV for assets built before 1997. The RAV is not applied to assets on the basis of their being reusable

but being unlikely to be replaced. Ofcom adopted this approach in 2005, not in response to the Recommendation.

Ofcom's approach is therefore not evidence in support of the use of a dual valuation approach based on reusable assets that will not be replaced; nor of the use of a RAB within a TSLRIC model.

1.9 The "reusable assets that will not be replaced" will either be built new or eventually be replaced

The European Commission rationale for its proposed approach for NGA costing quoted by Network Strategies includes the line "because the build option is not economically feasible for this asset category". This is not true in New Zealand. Assets allegedly in this class such as ducts are being built anew today. The LFCs including Chorus are building new networks today, including substantial new construction work on duct.

The remainder of these "reusable assets that will not be replaced", such as re-used poles which may be used for aerial distribution within the LFC networks, may not be being rebuilt today but they will need to be replaced in the future. We should recall that the "long run" in the definition of LRIC is "the time period over which all costs are variable". The assets do not have an infinite lifetime; the costing therefore needs to include the future cost of replacement of these assets. Any depreciated valuation that values fully depreciated assets at zero fails to allow for such future replacement costs.

1.10 RAB approaches using lock-in are not LRIC approaches

Some RAB approaches "lock in" each year's prudent capital expenditure as it occurs; they do not later revisit (by "revaluation") whether the asset base (inside the RAB) remains the most efficient way to produce the required outputs. By contrast, forward-looking TSLRIC approaches do undertake revaluation: they take the currently efficient means of production into account.

Approaches using a locked-in RAB, such as that proposed by the European Commission[9], are therefore not TSLRIC approaches and these approaches are not available to the Commission under the FPP.

[9] European Commission, COMMISSION RECOMMENDATION of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment, para 38.