

VODAFONE NEW ZEALAND LIMITED
CROSS SUBMISSION
TO THE NEW ZEALAND COMMERCE COMMISSION



on

**FURTHER DRAFT PRICING REVIEW DETERMINATION FOR
CHORUS' UNBUNDLED COPPER LOCAL LOOP SERVICE**

and

**FURTHER DRAFT PRICING REVIEW DETERMINATION FOR
CHORUS' UNBUNDLED BITSTREAM ACCESS SERVICE**

Public Version

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Executive Summary

- i) More than 1.1 million Kiwi families and businesses depend on Chorus' copper network for broadband access.¹ While the UFB Initiative has secured our fibre future, securing cost-oriented copper access is essential to ensure our industry can continue to deliver real benefits to New Zealanders, especially as the majority of broadband connections continue to rely on copper for the foreseeable future.
- ii) It's not surprising then that the Commission received many submissions on its July decision: from industry as well as end-users and consumer groups. We've reviewed all of these submissions and expert reports, which have galvanised our central view: the prices that the Commission proposes that Chorus should be able to charge for its copper network are too high. They over-estimate Chorus' costs (let alone those of a hypothetically efficient operator) and, ultimately, are out of step with comparable TSLRIC modelling in other markets.
- iii) Chorus and its experts come to the opposite conclusion, suggesting that consumers in New Zealand should pay even more for copper broadband services. We don't agree. We address Chorus' submission, and their expert reports, across three broad themes:
 - a. **Backdating:** The analysis provided by Chorus and its consultants is grounded in a misplaced understanding of the regulatory framework set out in the Act. Backdating in this instance would significantly harm competition and introduce further market distortion and uncertainty. The majority of the Commission was correct to reject backdating.
 - b. **Non-recurring charges:** Chorus seeks prices for non-recurring charges which are plainly above an efficient network operator's costs. We strongly oppose this, and support the Commission's principle of applying significant efficiency adjustments to these costs.

Monthly charges: As set out in our primary submission, we remain of the view that appropriate changes to the Commission's cost model should deliver significant reductions in monthly recurring charges. The adjustments proposed by Chorus and its experts, which would further inflate monthly prices, should be rejected. There is nothing especially unique about New Zealand which means Kiwis should pay so much more for broadband. FWA coverage must be reconsidered as TSLRIC requires a HEO's network that reflects real-world technologies and efficient network deployment. Network Strategies' FWA model presents a workable solution that appends to TERA's cost model.

Backdating

- iv) The Commission's majority position in the July draft decision is the right one. Backdating simply won't promote competition for the long-term benefit of end users.
- v) We reject Chorus' assertion that backdating is mandatory. Our position, which is explained in the accompanying opinion prepared by counsel for Vodafone, is that at most the Commission has a discretion to backdate which it may or may not exercise. That discretion has been reasonably and

¹ As at 30 June 2015, Chorus Annual Report 2015, page 6.

tenably exercised by the majority of the Commission in the July draft decision, in light of the specific circumstances and evidence before it.

- vi) This conclusion is supported in the economic analysis before the Commission. Chorus' assertion that the majority position undermines regulatory predictability or investment incentives should be rejected. Specifically, we refer to the expert opinions of:
 - a. Dr. Trillas, whose review of Sapere's reliance on his own work on time inconsistency (which is central to Sapere's conclusion) concludes that his text has been taken out of context and that the concept of time inconsistency is ultimately not relevant to this process because backdating was signalled as a possibility in 2013; and
 - b. DotEcon, who conclude that Sapere's claim about the intended function of the regulatory framework is unsubstantiated and its conclusions logically flawed.
- vii) The Commission (in its majority view) has correctly identified and properly weighed the detrimental impact that the retroactive application of price changes will have on predictability. Backdating would, in this case, harm the long-term interests of New Zealand telecommunications end-users. It would significantly harm competition, and introduce new distortions into a market that is already operating under uncertainty. Chorus' view that prices should be backdated should be rejected.

Non-recurring charges

- viii) The Commission must identify how a hypothetically efficient operator will undertake non-recurring tasks using forward-looking efficient techniques and costs. TERA's international benchmark is - in principle - an appropriate approach, although it requires further efficiency adjustments. Chorus' submissions derive from the central proposition that the Commission ought to adopt Chorus' actual costs. This is fundamentally at odds with the core principle of TSLRIC cost modelling. Chorus' current processes are not efficient, and therefore are unsuitable as evidence of a HEO's costs. Chorus' proposed revisions to the Commission's approach to NRCs would not lead to efficient costs and must be rejected.

Monthly charges

- ix) The monthly charges proposed in the July draft decision are well above the true TSLRIC level. Chorus and its experts propose a series of adjustments to further inflate the cost calculation. These must be rejected.
- x) We note that Chorus' submission on FWA is inconsistent with the expert report it provides from Analysys Mason, which in turn is entirely inconsistent with the same firm's advice to the Finnish regulator. We prefer Analysys Mason's conclusions in respect of Finland, where it advises that wireless technology should be considered within efficient forward-looking cost optimisation and in rural areas where unbundling is unlikely.
- xi) We do not accept Analysys Mason's FWA coverage conclusions. They are plainly out of touch with the capability of modern wireless technology. Compared with our real-world investment under the Rural Broadband Initiative, Analysys Mason's model requires three times as many base stations and yet would reach only 16% of the customers. It must be rejected.

- xii) Of particular importance, we retain the view that the Commission must adopt Network Strategies' FWA model. It is a workable solution that can be applied to all non-unbundled areas, is based on actual terrain and propagation conditions in New Zealand, and reflects the cost optimisation decisions that would reasonably be expected of an HEO.
- xiii) Finally, Chorus's central argument that New Zealanders should pay more for copper broadband rests on the proposition that Chorus' actual own costs are relevant to a HEO. We emphatically reject this analysis. Fundamentally, it is inconsistent with the TSLRIC exercise the Commission is required to apply - which imagines a hypothetically *efficient* operator, not an incumbent monopolist. As importantly, in reviewing a range of the 'costs' Chorus point to, our consultants have identified a wide range of deficiencies: including double-counting of costs and ignored opportunities for more efficient network design and deployment choices.
- xiv) In our view, it is critical that the Commission remains true to the task at hand. As it has set out to do in much of its draft decision, it must ensure that the cost modelling inputs reflect the network design and deployment choices of a hypothetically efficient operator – and not those suggested by the incumbent.

Recommendations

- xv) The Commission must now ensure that its final determination truly reflects the deployment and network design decisions a cost optimising efficient operator would make. With that in mind, and in light of the Commission's further draft determination and submissions before it, we urge the Commission to heed the following recommendations.
 - R 1. Recognise that Sapere's arguments are unsubstantiated and logically flawed. Not to backdate is not time inconsistent nor opportunistic regulatory behaviour. A focus on consumer welfare will not result in inefficient outcomes.
 - R 2. The Commission has correctly identified and properly assessed the evidence on the impacts of backdating. The retroactive application of a decision would have a significant impact on regulatory predictability. The Commission must maintain its majority view: not to backdate.
 - R 3. Implement an analysis consistent with the Commission's own statement: 'FWA should be used for lines where costs are particularly high and unbundling is unlikely'. The Commission should adopt FWA for users in all Zone 3 and 4 areas where there is no current unbundling and future unbundling is unlikely, and adopt Analysys Mason's recommendation of wireless technologies in areas where there is unlikely to be a business case for unbundling.
 - R 4. Adopt actual, best-practice, capacity information in place of the currently used throughput demand driver of copper capacity. As copper throughput capacity is meaningless in for a HEO's fibre and FWA network: fibre throughput does not degrade with distance.
 - R 5. Adopt actual, best-practice, FWA coverage that reflects the laws of physics: radio signal is not limited by map boundaries and FWA sites are not perfectly formed square footprints. Ensure base stations are sited as needed, so based on actual topography of the geotype.
 - R 6. Adopt Network Strategies' FWA model as a workable solution that can be applied to all non-unbundled areas, as this is based on actual terrain and propagation conditions in New Zealand and reflects the cost optimisation decision of a HEO deploying FWA in areas

where it is feasible and economical. This FWA model is designed to append to TERA's cost model.

- R 7. Reject Chorus' submission on NRC efficiency adjustments as this ignores potential efficiency improvements, locates a HEO off the efficiency frontier, and also ignores Chorus' own public statements and industry-wide programmes to improve NRC efficiencies.
- R 8. Retain TERA's international benchmarking approach and adapt this to account for efficiency improvements.
- R 9. Retain TERA's current approach of weighting service costs per CSA by volume of lines. Reject Chorus' percentile approach.
- R 10. Reject Chorus' argument that real overhead costs reflect efficient overhead costs.
- R 11. Do not inflate NRC related costs by using benchmarked LFC values.
- R 12. Reject Chorus' submission that actual costs are efficient: transaction services such as 'manual prequalification order', 'manual line testing' or communicated results like 'no fault found' are the result of Chorus' inefficiencies.
- R 13. Apply a moderate price reduction factor of between -3% and -5% per annum to NRCs to reflect both changes in labour costs and further efficiency improvements that are realistic within the forthcoming regulatory period.
- R 14. Reject Chorus' statement that all TSO connections that existed in December 2001 (so including multi access radio connections) must be included in the modelling, regardless of technology and broadband availability.
- R 15. Ensure appropriate network optimisation in the core network, MDF locations, and the access network through ensuring an appropriate "bottom up" approach to network design and taking into account opportunities for efficiency gains and sharing between services.
- R 16. Ensure double counting of lead-in contributions does not occur.
- R 17. Disregard Analysys Mason's trenching cost analysis, as both the input costs and the statistical methods are unsound.
- R 18. Reflect evidence from LFCs that indicates that aerial deployment is used wherever possible since aerial reticulation is more cost-effective than undergrounding. Acknowledge that a HEO could feasibly achieve aerial deployment above the level of EDBs.
- R 19. Reject CEG's proposed 'bespoke' indices for price trends as the use of historical data violates the forward-looking requirement of TSLRIC, and because the suggested weightings are not supported by evidence that these reflect an efficient operator.
- R 20. Reject CEG's claim that the Commission's cost of equity methodology is inappropriate.
- R 21. Retain the current decision not to uplift the central TSLRIC estimate, nor the WACC.

A Introduction

A1.1 Vodafone welcomes the opportunity to comment on submissions to the Commission's Further Draft UBA and UCLL Determinations and accompanying reports released on 2 July 2015.

A2 Referencing FPP documents

A2.1 Specifically, we review and provide recommendations in respect of submissions and expert reports made in response to the Commission's **Further Draft UCLL Determination** and **Further Draft UBA Determination**.

A2.2 This submission should be read along with the expert reports by WIK-Consult, Network Strategies, DotEcon and Dr Francesc Trillas submitted at this cross submission stage.

A2.3 We also refer to earlier Commission documents, submissions and cross submissions as per the referencing set out in our August 2015 Submission.

A3 Narrow focus for this Cross Submission

A3.1 In this Cross submission we focus on submissions made on:

- (a) Backdating
- (b) Fixed Wireless Access; and
- (c) Non-recurring charges.

A3.2 In the final section we provide a brief overview of the key points raised by WIK-Consult and Network Strategies on further matters.

A3.3 We direct readers to WIK-Consult and Network Strategies' detailed responses to the submissions made by Chorus, Analysys Mason, Sapere and CEG. We fully support the analysis carried out by WIK-Consult and Network Strategies, and share the conclusions reached.

Part 1: REGULATORY CERTAINTY

B Backdating

B1 Introduction

B1.1 The Commission majority decision, in proposing not to backdate FPP prices set for the UCLL and UBA services, is correct. There is no statutory requirement for the Commission to backdate, and to the extent the Commission does have the discretion to backdate the majority's approach is the correct application of this discretion: The Commission's July 2015 further draft determinations correctly identify and properly assess the impacts of backdating.

B1.2 Chorus submit that the final FPP prices should be backdated to apply for the duration of the IPP period: from December 2014 for UBA, and from December 2012 for UCLL. Chorus (and Sapere's) main arguments are:

- (a) The IPP/FPP framework is designed to provide an 'assurance' to affected parties that prices set via a TSLRIC calculation will be applied when requested, and that this assurance function *requires* that FPP prices apply from the date of any IPP determination.
- (b) If the Commission does not backdate to the start of the IPP it will be behaving in a time-inconsistent manner, and so represent a regulator that can be trusted not to exploit the 'sunkness' of investments through a redistribution of surplus from producers to consumers. Sapere goes as far as inferring that by not backdating, the Commission would exploit the fact that the underlying investments made by Chorus are sunk in a regulatory end game where consumer benefits take priority over the need to maintain appropriate incentives for future investment.
- (c) Not backdating would be incompatible with the Commission's duty to promote s 18 of the Act, in particular as this duty has to be interpreted with reference to a total welfare standard rather than a consumer welfare standard.

B1.3 The Commission should not accept these arguments, which are based on unsubstantiated claims regarding the intended function of the IPP/FPP framework. The conclusions drawn from those claims made are, furthermore, logically flawed.

B2 The Commission has discretion to backdate and has correctly applied its discretion

B2.1 As set out in our August 2015 Submission, the Commission is not required to backdate FPP prices set for the UCLL and UBA services. It has a discretionary power to do so.²

B2.2 Chorus disagrees and argues that FPP prices are inherently more accurate and efficient, and should therefore be substituted for IPP prices. It considers that such substitution is consistent with the purpose statement in Section 18 of the Act and that such substitution from the date of determination of the IPP price is correct as a matter of law.³ Central to Chorus' position is the view

² Vodafone, August 2015 Submission, B.1.1

³ Chorus, August 2015 Submission, paragraph 285 and 287 on.

that the Court of Appeal's decision in *Telecom v Commerce Commission & Ors*⁴ requires a price review determination to relate back to the date of the initial determination.

B2.3 Vodafone disagrees fundamentally with this view for reasons already set out in our August 2015 Submission. Our reasoning is elaborated in an opinion prepared by counsel for Vodafone, Paul Radich QC and Matthew Smith, which is provided with this cross-submission. This opinion responds directly to arguments put in Chorus' August 2015 Submission and explains why the draft decision of the Commission majority that FPP prices should not be backdated to apply from 1 December 2014, is a decision that the Commission is legally entitled to make.

B2.4 The opinion sets out counsels' view that:

- (a) The facts, circumstances and economic analysis that is now available before the Commission in respect of the current question as to whether FPP prices should be backdated is such that, while the Commission is entitled to follow the decision in *Telecom v Commerce Commission & Ors*, there are grounds to say that it need not do so.
- (b) If the Commission does elect to follow this decision then, while it has a power to backdate FPP prices, it is not required as a matter of law to do so. Whether to backdate is a discretionary matter.
- (c) The draft decision of the Commission majority that FPP prices should not be backdated is reasonable and tenable is clearly open to the Commission at law and on the evidence before it.

B3 The concept of an assurance function

B3.1 Sapere characterises the 'economic rationale' for the FPP method as providing 'the assurance that prices can and will be set using TSLRIC, should any affected party be sufficiently dissatisfied with the result of the IPP to call for the FPP.'⁵

B3.2 Further, Sapere claim that the decision not to backdate FPP prices:⁶

'[...] places little weight on the assurance function of the FPP, and by implication on the investment incentive implications of this delay. This is based on the view that Chorus faces only limited future investment requirements to supply the UCLL and UBA services, that Chorus is able to cover its costs and that the IPP/FPP pricing method is unlikely to be applied in the future to major new bottleneck investments. This reasoning implies that if Chorus' circumstances were different – that is, if it was at an early stage of the investment cycle for UCLL and UBA services, or if Chorus was not able to cover its costs, or if the IPP pricing was expected to be applied in the future to major new bottleneck investments – then investment incentive implications would be given more weight. We interpret this line of reasoning to be a version of a regulatory 'end game'.

B3.3 However, this concept denies the reality that an IPP price may remain standing without the benefit of any 'assurance' as to its efficiency. The statutory scheme does not presume that an IPP price requires subsequent assurance to operate as an efficient price in the period during which it is effective. An IPP price continues to have effect and is enforceable unless and until a new price

⁴ CA75/05, 25 May 2006.

⁵ Sapere, August 2015 Report, paragraph 17.

⁶ Sapere, August 2015 Report, paragraphs 22 – 24.

is set by an FPP determination.⁷ There is nothing in the Act to suggest that the validity of an IPP price in the period it runs is contingent on subsequent assurance via an FPP process (an application for price review is not assumed to follow in all cases). Provision in the Act for a first price to be subject to determination under a second methodology on application does not imply an assurance function in the sense that Sapere or Chorus describe it.

B3.4 We highlight DotEcon's finding that Sapere's reasoning contains the logical fallacy of 'denying the antecedent'. The Commission's reasoning does not imply that it would have come to a different conclusion if Chorus' circumstances were different. Rather, the Commission explains the deliberations that have led to a decision against backdating, reasons that remain valid were Chorus at a different stage of its investment cycle. These reasons include that:

- (a) the difficulty for RSPs to adopt draft prices in advance of a final FPP determination, and apply their own TSLRIC modelling in the future also as the current decision on backdating would not bind future Commissioners; and
- (b) a decision to backdate would give "draft decisions a significant price signalling status" which in the Commission's view "is not consistent with the legislative scheme."

B3.5 Further, the fact that the Commission considers whether not backdating might have a disproportionate detrimental impact on Chorus is evidence of the Commission's concern about maintaining investment incentives and absolutely does not demonstrate an intention to behave opportunistically.

B3.6 Interestingly, Network Strategies highlight that they have not previously encountered a regulatory concept of an 'assurance' function in telecommunications nor other sectors.

The intention of the regulatory regime

B3.7 The September 2000 Fletcher Report (the final report of the Ministerial Inquiry into Telecommunications), which represents the best evidence of the regulatory thinking underpinning the current IPP/FPP framework, clearly included the requirement for a regulatory regime that provides certainty and resolves potential conflicts swiftly.

B3.8 It is clear that the IPP is intended to serve as a proxy for the FPP.⁸ The IPP was intended to:⁹

ensure that an appropriate pricing principle can be applied in the first instance for disputes to be resolved expeditiously. The initial determination would ideally get sufficiently close to the 'efficient'

⁷ s 42(2) of the Act.

⁸ Fletcher, H. (2000), page 68.

⁹ Fletcher, H. (2000), *Ministerial Inquiry into Telecommunications, Final Report*, 27 September 2000. For example, on page 29 there are references to "the benefit to the industry and to users of resolving any disputes expeditiously; the inability of generic competition law and the courts to establish clearly defined access obligations (including pricing principles) for the industry, and the resulting uncertainty, delay, and cost that this imposes on the industry; and the fact that many contentious issues in relation to access are common to more than one set of access negotiations and that consistency in the resolution of such issues is desirable to produce greater certainty for new entrants." Page 55 of the Final Report states that "[a] further and important benefit of the Inquiry's recommended regulatory regime is that of certainty. The Inquiry has sought to maximise certainty by elaborating processes, powers and principles in legislation and including checks and balances where possible. This is in stark contrast to the existing regime, which has no rules or guidelines governing the interactions and negotiations of industry players." See also page 47.

price so that both parties accept the determination and decide not to progress to the (longer and more costly) pricing review determination.

- B3.9 The efficiency benefits from providing a certain environment, and doing so without delay, are also clearly apparent in the design of the IPP/FPP framework. An initial pricing method based on benchmarking aims for speed: “[to] *enable the Commissioner to announce his/her decision within a short timeframe.*”¹⁰ More specifically:¹¹

“[t]he initial determination and (if required) the pricing review determination may require different pricing principles, because it may not be possible to apply a certain type of pricing principle within the timeframe that the initial determination has to be made. This is not a shortcoming of the regime, but rather a design feature to ensure that an appropriate pricing principle can be applied in the first instance for disputes to be resolved expeditiously. The initial determination would ideally get sufficiently close to the ‘efficient’ price so that both parties accept the determination and decide not to progress to the (longer and more costly) pricing review determination.”

- B3.10 Furthermore, a perceived downside of cost modelling was not only that it was time-consuming, but also that it was open to dispute and disagreement, and thus outcomes would not be certain.¹² Despite this, the requirement for an ‘assurance function’, even as per the concept posited by Sapere but without their label, is not mentioned in the Fletcher Report.

- B3.11 In addition to the Fletcher Report, neither the current legislation nor regulatory decisions under this regime mention an ‘assurance function’ that would ensure an IPP price be superseded, retrospectively, by an FPP price. Rather, as DotEcon highlight, the IPP/FPP framework:¹³

might be more appropriate to be seen as providing affected parties with the option to seek a review of pricing where they consider that IPP prices are not a good proxy for those that would come out of a full cost modelling exercise with all the associated uncertainty. This acknowledges the obvious benefits from having in place regulated charges without much delay and without the uncertainty that is associated with the outcome of a cost modelling exercise.

- B3.12 Sapere seems to argue that price profiles do not matter, and that RSPs would be able to recoup a backdated higher price. This overlooks the fact that both investment and usage decisions depend on actual prices and price forecasts, and will be affected and potentially distorted by a backdated amendment.¹⁴ As DotEcon explain in their August Report, under a general backdating regime, market participants would not be able to rely on IPP charges but would have to form expectations about what the prices they pay and the revenues they earn will eventually be, and

¹⁰ *Ibid*, page 32.

¹¹ *Ibid*, page 45.

¹² “As a number of submissions pointed out, cost-based models (e.g. TSLRIC) are complex and take considerable time to develop. In addition, they require numerous assumptions on which there can be legitimate differences of opinion. Thus, not only can cost-based modelling be expensive and take considerable time to complete, but agreement about the appropriate interconnection and data tail access prices deriving from such models can be difficult.” (*ibid*, page 55)

¹³ DotEcon Opinion, September 2015, section 3.

¹⁴ The presence of past distortions and the role of regulated prices in sending correct price signals is clearly acknowledged by CEG, which makes reference to the Sapere paper in its report for Chorus: “[a] policy of backdating will ensure that prices reflect the efficient estimate of costs at most points of time ... A decision to backdate now cannot reverse the errant consumption signals of the past but may influence longer term investment decisions for access providers and access seekers” (CEG, Response to the further draft determination, August 2015, paragraph 298). This broadly corresponds to the arguments made in our earlier submission, but ignores the impact of uncertainty associated with backdating.

act on the basis of these expectations (which they might not be able to do). Such a concept renders useless much of the benefits of speed and certainty that the IPP provides.

- B3.13 It would have been easy for the Fletcher Report to include a recommendation that, in the case that one or more parties sought a determination under the FPP, this determination would be effective from the date of the initial determination. No such recommendation was included, nor even mentioned as considered.

B4 Time inconsistency

The concept of time inconsistency

- B4.1 Sapere submit that the Commission is setting its regulatory approach to backdating and to WACC in direct response to Chorus' specific 'point in the investment cycle' and, furthermore, submits that by doing this the Commission is behaving in a time inconsistent manner. In Sapere's view, the Commission's reasoning:¹⁵

appears to be a version of a regulatory 'end-game' where the regulator holds the view its approach to pricing will have no effect on future investment and therefore it can act in a time inconsistent (or opportunistic) manner at no cost to the long term benefit of end-users.

- B4.2 In contrast, time inconsistency would describe the following regulator actions: what the regulator expects (and has promised) it will do at some point in the future is then not what the regulator (later) proposes to do (and perhaps actually does).

The relevance of time inconsistency to the IPP/FPP regulatory process

- B4.3 The Commission is not behaving in a time inconsistent manner. Sapere's report appears to confuse opportunistic changes in the rules - which are at the heart of concerns about time consistency in regulatory policy - with the exercise of discretion under the rules. As explained above, the decision whether or not to backdate does not amount to a 'change in policy' but is rather an issue over which the Commission has discretion under the existing regulatory framework.
- B4.4 WIK-Consult highlight that a regulator cannot remove the risk borne by market participants associated with uncertainty of the final result of a TSLRIC modelling process. Moreover, that whilst making changes to modelling approach and parameters during a process reduces the predictability of the final outcome, on the other hand:¹⁶

it is a key element of a fair, transparent and efficient process, that the regulator takes note, fairly assesses contributions of stakeholders [...] and is prepared to change positions [upon receipt of with convincing evidence]. We tend to consider the openness of a regulator to change positions as the greater contribution to an efficient and informed decision making than [sic] the inherent increase of the uncertainty regarding predictability of the outcome.

- B4.5 Sapere's statements regarding the Commission's previous decisions on WACC are incorrect. Whilst Sapere state that the Commission has adopted a WACC above a midpoint for many years,

¹⁵ Sapere, August 2015 Report, paragraph 114.

¹⁶ WIK-Consult, September 2015 Review of Submissions, section 6.

Network Strategies advise that in fact, during 2000-2010 the WACC adopted for all TSO Determinations was the midpoint estimate.

B4.6 Sapere presents quotes from articles that we submit are not relevant to this IPP/FPP process:

- (a) Levy and Spiller (1994) considers the 'potential for administrative expropriation or manipulation' by studying the interaction between political institutions and regulatory processes in the telecommunications sectors of Argentina, Chile, Jamaica, the Philippines and the United Kingdom. The authors state the relevance of their analysis for the design of regulatory policy in developing and newly industrialising, and previous socialist countries. This doesn't sound like New Zealand. Moreover, the three mechanisms for administrative restraint that the authors recommend have all operated in New Zealand for many years.¹⁷
- (b) Spiller (2011) discusses the implications of government opportunism with a focus on the developing countries of Argentina and Bolivia.
- (c) Ergas (2009) identifies the periodic model updates, applied by the ACCC following following (TSLRIC) access disputes, as problematic. However as explained by Network Strategies, the "*issue that concerns Ergas relates more generally to the implementation of TSLRIC methodologies rather than the regulator opportunistically changing its approach over time.*"

B4.7 Sapere also quote Levine, Stern and Trillas' 2005 Oxford Economic Journal (OEJ) article on time inconsistency in monetary policy in an attempt to bolster their warning against the Commission behaving in a time inconsistent manner. However the conclusion of the OEJ paper is that time-inconsistency issues may be addressed through a rules-based approach to regulation or delegation to an independent conservative agency with discretionary powers defined in primary legislation. We submit that this description closely resembles the design of the NZ regulatory regime for telecommunications.

B4.8 We approached Dr Francesc Trillas, one of the co-authors of this paper, to enquire whether he judges his analysis on the risks of time inconsistency to be relevant to the New Zealand IPP/FPP context. He does not.

B4.9 Dr Trillas' expert opinion is included alongside this submission. In summary, Dr Trillas advises:

- (a) That the OEJ paper focusses on time inconsistency in general terms. The paper focusses on regime design challenges for telecommunications regulation for developing countries. The analysis' main concern is ensuring that the majority of citizens in developing countries have access to telecommunications services.
- (b) The paper is written in relation to a market structure that is different to that seen in present-day NZ, is written with reference to the regulation of a single, vertically integrated, monopoly utility, and in stark contrast to the NZ context of an upstream monopoly with downstream access seeking competitive RSPs.
- (c) The OEJ paper considers a scenario where a sunk investment is made prior to a regulatory decision that affects that same investment. The current situation in NZ is

¹⁷ Network Strategies, September 2015 Review of Submissions, section 9.

different: upstream investment in fibre is agreed via UFB and RBI programmes, including with regards to deployment subsidies, and is not conditional on the outcome of the copper pricing review. Chorus is required simply to maintain copper networks, and is not running a programme of copper investment. In contrast to the upstream situation, the downstream RSPs are making investments in services provided over copper.

B4.10 Furthermore, Dr. Trillas shares his view that “*according to the required conditions for time inconsistency, it is my opinion that whatever the Commission’s decision on backdating, it will not be behaving in a time inconsistent manner.*”

B4.11 We support Network Strategies’ view that:¹⁸

The logical outcome of Sapere’s arguments is a recommendation to remove all discretion from the regulator. However Sapere has failed to prove that this is necessary in the New Zealand context since all of the empirical evidence provided in its references is either irrelevant or inappropriate in relation to our political and regulatory institutions.

and further, that:¹⁹

the Commission is behaving completely consistently with its previous practice in respect to its mid-point WACC assumption in telecommunications regulation. Sapere suggests that with in the absence of backdating the Commission is applying different pricing methods. Again Sapere is incorrect – both the IPP and the FPP are TSLRIC based. IPP benchmarks were selected on the basis of comparable countries that have developed TSLRIC cost models.

Finally, if Sapere is in fact accusing the Commerce Commission of lacking independence with its decisions unduly or improperly influenced by political agents or other forms of regulatory capture then it should provide specific details.

B4.12 WIK-Consult also support this view:²⁰

Furthermore, Sapere’s analysis of investment impacts of backdating is focussed solely on Chorus’ investment. It totally ignores the impact of the Commission’s decision making on RSPs’ investment. We have shown in our August 2015 Submission that impacts on these investments may be even more obvious and relevant.

[and]

We agree that time consistency is an important regulatory principle in the case of price regulation to maintain efficient investment incentives in the sector. The Commission would not be violating this principle if it were not to backdate the FPP prices.

B4.13 Dr. Trillas also highlights the importance of regulator discretion:²¹

The theoretical arguments and the emerging empirical literature on regulatory governance suggest strong potential benefits from well-founded regulatory arrangements with proper and transparent procedures that will support limited and accountable discretion.

¹⁸ Network Strategies, September 2015 Review of Submissions, section 9.

¹⁹ Network Strategies, September 2015 Review of Submissions, section 9.

²⁰ WIK-Consult, September 2015 Review of Submissions, section 6.

²¹ Dr. Trillas, September 2015 Opinion.

B4.14 To conclude, we submit that the question of backdating of NZ copper access prices within the NZ context of IPP/FPP has been signalled as a possibility since late 2013 and so neither the decision to backdate nor the decision not to backdate could be labelled as time inconsistent.

B5 The long term benefit of end user and welfare standard

B5.1 Sapere claim that the Commission is incorrect to conclude that section 18's reference to the long term benefit of end users leads to a consideration of consumer welfare, and alleges the Commission is 'holding up' investing firms.

B5.2 We, along with our expert advisors Network Strategies, WIK-Consult and DotEcon, submit that the consumer welfare standard is more appropriate than a total welfare standard in the present context.

B5.3 The efficiency standard inherent in the TSLRIC approach ensures producer surplus can be realised by suppliers. Network Strategies explain:²²

Under TSLRIC producer surplus will be generated if access providers supply services efficiently, and continue to seek to innovate in service provision.

Furthermore, given that the FPP costing standard includes 'a reasonable allocation of forward-looking common costs', it is logical to expect that Chorus will achieve a reasonable return on its sunk copper assets.

B5.4 Sapere's submission on the required interpretation of section 18 and what is meant by 'long term benefit to end users' is notable that it neglects to acknowledge that the question of which is the appropriate welfare standard is well-trodden ground. As DotEcon highlight: "*the issue is not so much about whether producer surplus (or profits made by suppliers) should be ignored, but about the appropriate timeframe over which benefits are assessed and within which the need for profits as an incentive for investment need to be acknowledged.*"²³ This view is clearly expressed in the statement from Professor Hausman (prepared on behalf of Chorus) that the Commission's further draft determination also quotes:²⁴

"While my view is that the consumer welfare standard is the correct standard to evaluate telecommunications policy and regulation, it is crucial to understand the correct time frame for the evaluation of consumer welfare. Over time, increases in consumer welfare will not occur unless significant investment occurs. And since most investment in telecommunications is sunk cost investment, the investment is riskier than [sic] much other investment. Thus, regulation must create correct economic incentives to encourage firms and investors to commit funds to investment. In my view in concept of the "long-term benefit of end-users" (LTBE) the word "long-term" is very important because it incorporates the effects of investment. In economics "long-term" means taking into account a period long enough so that the capital stock changes, and is not fixed, as it is in the short-term. [...]

What I, and other economists mean, is consumer welfare over the "long-term" when the welfare increasing effects of investment and innovation have been taken into account."

²² Network Strategies, September 2015 Review of Submissions, section 9.3.

²³ DotEcon, September 2015 Opinion, section 4.

²⁴ Commerce Commission, Further Draft Determination, July 2015, paragraph 238.

- B5.5 The Commission states that it broadly agrees with Professor Hausman, noting that it is important to consider the extent to which producer surplus would ultimately provide incentives for making investments that create long-term benefits for end users. Thus, as highlighted by DotEcon:²⁵

Sapere's discussion of the relative merits of different welfare standards does not seem to acknowledge that the Commission's views are much more nuanced. The claim that section 18 "does not include an explicit provision to limit the ability of suppliers to extract excess profits"²⁶ is at the very least surprising if one assumes that excess profits means those profits that are not rewarding risk taking and are needed to recoup past investments and provide incentives for future ones. Sapere would be correct if it said that section 18 does not authorise the Commission to expropriate what might appear to be economic profits in the short term but is actually required to provide incentives for investment and innovation.²⁷ However, this important differentiation between short-term and long-term effect seems to be largely absent from Sapere's discussion (for example when one of the arguments why section 18 is not tractable as a consumer benefit test is that in doing so one might ignore the "potential loss of dynamic efficiency benefits from innovation or improvements to service quality."²⁸)

- B5.6 Sapere also submit that the Commission's proposed WACC would not provide Chorus with a reasonable rate of return on regulated copper assets. Network Strategies have previously carried out a peer review of Vector's analysis of Chorus' return on copper investments compared to the hypothetical return the Commission could be expected to allow were Part 4 regulation applicable. Vector calculated a ROI on copper assets of 19-23%, which contrasted with WACCs of 8.77% (2009) for EDB DPP, 7.44% for gas pipeline services, and 7.01-8% (for information disclosure purposes) for airports.²⁹ We agree with Network Strategies' conclusion: "*this analysis does not support Sapere's contention that Chorus is being inadequately rewarded for its copper investment, even at the IPP price.*"³⁰
- B5.7 Under the current regulatory regime, Chorus enjoys a return on capital that is greater than most other regulated services in New Zealand. A focus on consumer welfare will not result in inefficient outcomes, and so no additional regard to producer surplus is required. As such the Commission should in these proceedings continue to focus primarily on the promotion of consumer welfare, as required by Section 18.

B6 The effect of backdating

The rare conditions under which backdating could be efficient

- B6.1 Backdating access prices implies that transactions between RSPs and Chorus that took place at the IPP price are, at a future point in time, retrospectively re-valued. If this is to occur, it must be clearly used to promote statutory objectives, i.e. it must maximise the promotion of competition for the long term benefit of end users.

²⁵ DotEcon, September 2015 Opinion, section 4.

²⁶ Sapere, August 2015 Report, paragraph 46.

²⁷ For the avoidance of doubt, excess profits, properly identified, would have to be eliminated also under a total welfare standard.

²⁸ Sapere, August 2015 Report, paragraph 62.

²⁹ Network Strategies, September 2015 Review of Submissions, section 9.

³⁰ Network Strategies, September 2015 Review of Submissions, section 9.

- B6.2 As presented in DotEcon's August 2015 Report and our August 2015 Submission, backdating could in principle promote efficient outcomes in the rare situation that all parties:
- (a) have certainty that backdating will occur;
 - (b) have certainty of the period over which backdating will apply;
 - (c) have certainty of the terms that will apply in market if backdating occurs; and
 - (d) can behave in the market as if 'new' prices to be backdated already applied during the periods within which these prices will be related back.

B6.3 However, these necessary cumulative conditions are not present in the current regulatory determination process.

Backdating would cause substantial distortions in the New Zealand market

B6.4 The current FPP process is different to the circumstances in which backdating has been applied elsewhere:

- (a) there is no evidence that not backdating will lead to inefficiencies;
- (b) the final outcome of the Commission's TSLRIC exercise is not predictable;
- (c) there is no evidence that Chorus will not be able to cover actual costs in the absence of backdating;
- (d) backdating will not promote competition for the benefit of end users; and
- (e) IPP prices are valid and cannot be rendered redundant by backdating.

B6.5 It follows that the Commission should retain its current majority view that backdating will cause distortions in the market, and should not be applied.

B6.6 We summarise our experts' advice as:

- (a) **Dr. Trillas:** In a partially competitive telecommunications industry the commitment problem in regulation would be interpreted as the need to establish a stable regulatory framework. A stable framework is one in which both incumbents and entrants can plan ahead, and where uncertainties are reduced to technological and demand uncertainties, with regulatory or political uncertainties reduced to a minimum. The structure, practice and nature of the consultative process in regulation minimises any long run risk of under-investment due to time-inconsistent regulation. Thanks to transparent procedures, the final regulatory decisions will be made on a well-understood position as to the application of the legislation and best practice to relevant facts and circumstances, within a context of accountable discretion. In the New Zealand context (with a competitive retail market), a decision to apply backdating pricing rules, that is made at the end of a regulatory process, would be difficult to justify unless there are very clear and exceptional circumstances that recommend them.
- (b) **DotEcon:** Sapere's arguments hinge upon unsubstantiated claims about the intended function of the IPP/FPP framework and its conclusions are logically flawed. The allegation that the Commission is playing a regulatory end-game, jeopardising its

reputation for acting in a time-consistent manner and undermining regulatory predictability is unjustified. The Commission's majority view captures the key issues that should be taken into account when deciding whether to backdate. The Commission is not making an opportunistic change in policy and is not driven by a misguided focus on consumer welfare without due consideration of the potential impact on investment incentives.

- (c) **NWS:** The Commission is not behaving in a manner that is time inconsistent nor 'opportunistic'. Chorus enjoys a return on copper assets greater than the WACC afforded to other regulated utilities. The Commission is correct to apply a consumer welfare standard.
- (d) **WIK-Consult:** The Commission's majority decision not to backdate would not be time inconsistent and is correct. The assurance function of the FPP assures market participants that the FPP will be applied once determined.

B6.7 Backdating will not improve efficiency outcomes and will instead serve only to introduce new distortions and welfare losses into a market that is currently operating under uncertainty. Backdating FPP prices in these circumstances would not be consistent with the requirements adopted by all Commissioners, including Commissioner Duignan, that evidence must show that backdating is "*demonstrably efficient*" and will "*demonstrably promote competition in a way that is likely to directly benefit end users*" in order to decide positively that backdating will promote competition for the long term benefit of end users, which is the overriding consideration.³¹

| | |
|-------------------------|--|
| Recommendation 1 | Recognise that Sapere's arguments are unsubstantiated and logically flawed. Not to backdate is not time inconsistent nor opportunistic regulatory behaviour. A focus on consumer welfare will not result in inefficient outcomes |
| Recommendation 2 | The Commission has correctly identified and properly assessed the evidence on the impacts of backdating. The retroactive application of a decision would have a significant impact on regulatory predictability. The Commission must maintain its majority view: not to backdate. |

³¹ Commerce Commission, Further Draft Determination, July 2015, paragraph 856.

Part 2: THE COMMISSION'S TSLRIC INPUTS AND MODELLING

C Fixed Wireless Access

C1 Introduction

- C1.1 Chorus and Analysys Mason provide an inconsistent position on FWA. In our view:
- (a) Chorus' recommendations (against adopting FWA) are inappropriate; and
 - (b) Analysys Mason's arguments, in fact, support the approach to modelling FWA proposed by Network Strategies.³²
- C1.2 We find it curious that whilst Chorus still maintains that FWA should not be considered as a MEA, at the same time Chorus appears to be generally in agreement with the Commission's FWA implementation in the July draft.
- C1.3 Having reviewed the August 2015 submissions, our view remains that the Commission's current FWA implementation is inconsistent with that of an HEO.³³ The extent of FWA deployment must be determined by addressing the key question: what technology would a rational HEO that is seeking the most efficient/least cost MEA deploy? Thus the proper application of TSLRIC requires the Commission to determine the costs of an efficient access provider.
- C1.4 The Commission cannot therefore exclude FWA from the MEA given the existence of strong and compelling evidence that the HEO would include FWA in its network. The Commission's further draft determinations recognise FWA as a component of the MEA, but should do so to a greater extent. There is no case for the exclusion of FWA as Chorus contends. Excluding FWA from consideration altogether would directly undermine the very statutory exercise being undertaken here, being the determination of an "...*estimate of the costs of an efficient access provider over a sufficient period of time (long run), on a forward looking basis (reflecting the notional costs to an operator if it built a new network)*..."³⁴ Put simply, Chorus' proposed exclusion would not be a proper or lawful approach.
- C1.5 This section responds specifically to Chorus and Analysys Mason's views on FWA customers and areas, assumed coverage and required number of base stations.

C2 The relevance of FWA in the MEA

- C2.1 Chorus continues to submit that FWA cannot be considered an MEA technology as it would not allow for unbundling at Layer 1.³⁵ This should be rejected. In areas where costs are high, there is no current unbundling and future unbundling is unlikely, FWA should be included as a technology that the rational HEO, seeking the most efficient means of deploying an MEA, would use.

³² As detailed in Network Strategies' February 2015 FWA report and implemented in their FWA cost model.

³³ Vodafone, August 2015 Submission at paragraph A4.6.

³⁴ Chorus, August 2015 Submission, paragraph 41.

³⁵ Chorus, August 2015 Submission, paragraph 40.4.

C2.2 Chorus claims that “[o]ur UFB and RBI data is the best evidence of current costs of a nationwide build which reflects New Zealand conditions”³⁶. Inexplicably, the same standard of relevance is not attributed to data from Vodafone’s RBI build (which utilises FWA technology). We do not understand how Chorus’ choice of technology (and costs) can be deemed relevant to the MEA whilst optimally cost-efficient technology choices made by other infrastructure providers are deemed irrelevant. To the extent that this inconsistent consideration of available evidence operates to exclude or reduce the extent of FWA deployment within a MEA, we submit that this is not a proper approach.

C3 A HEO would deploy FWA customers based on cost optimisation

C3.1 The Commission defines the HEO’s FWA customers with reference to capacity degradation in a legacy copper network, and with no reference to the HEO’s definitive efficiency characteristic. An assumption is made that irrespective of an area’s terrain and customer density, the HEO will simply follow a blanket rule of providing fibre access to customers within a certain distance from an exchange.

C3.2 Chorus endorses the Commission’s approach which limits FWA deployment to approximately 40,833 low-speed or voice-only customers. Chorus states this FWA coverage reflects the current 2.5% of all Chorus connections that have no or low speed broadband.

C3.3 We have submitted that the Commission’s approach is entirely the ‘wrong way into’ this analytical exercise, and we continue to strongly urge the Commission to reconsider. We respond to Chorus’ submission on the same basis. The Commission must recognise that real-world current copper connections are irrelevant when considering the deployment a HEO would decide upon: in the HEO’s world, current telecommunication connections do not exist and a network is being built for the first time. Thus the Commission must assume the HEO will:

- (a) consider expected demand profiles (regardless of technology); and
- (b) in choosing deployment technologies, make an economic optimisation assessment across the supply costs of deploying fibre or FWA.

C3.4 Vodafone’s currently planned RBI network will reach more 250,000 customers. Previously, the Commission had acknowledged that 250,000 for the HEO’s FWA ‘felt about right’.³⁷ As highlighted by Network Strategies, assuming that only 16% of the projected customers that will be covered under Vodafone’s RBI FWA deployment would be served by the HEO via FWA is illogical.³⁸

C3.5 Furthermore, the Commission’s model assumes throughput of only 1 Mbit/s for low-speed customers and only 150 Kbit/s for voice-only customers. These assumptions ignore the evidence of throughput capability that is currently available to rural areas connected via FWA, and results in a massive underestimation of speeds available in rural areas. Vodafone’s most recent RBI wholesale services report to MBIE details an average download throughput of [REDACTED] VNZCI with an average maximum of [REDACTED] VNZCI. Given that distance to the

³⁶ Chorus, August 2015 Submission, paragraph 80.

³⁷ Commerce Commission, Further Draft Determination, July 2015, paragraph 1132.

³⁸ Network Strategies, September 2015 Review of Submissions, s 2.1.

exchange and throughput are network characteristics that are related, the Commission must be incorrect when assuming a distance threshold of 5.3 km for the deployment FWA.

- C3.6 We find it curious that Chorus now agrees with the Commission's approach which assumes customers in unbundled *urban* ESAs should be served by FWA. This seems to be a contradiction of earlier submissions made by Chorus which argued FWA should not be included at all as it cannot be unbundled.³⁹
- C3.7 Network Strategies has assessed Analysys Mason's mapping of customers selected by the Commission for FWA based on the applied criteria of copper line distance from the local exchange. It is evident from the geographical mapping that the Commission's criteria results in an inefficient deployment from a network planning perspective. Analysys Mason also recommends the Commission exclude from FWA those customers for whom UFB or HFC connections are available. We have not been able to reconcile this with Chorus' position.
- C3.8 Analysys Mason has proposed an alternative 'superior' FWA coverage approach that applies the copper distance limit, and then applies a threshold related to number of premises in a square grid cell, in essence requiring the density of premises to be sufficient to merit the deployment of FWA in that area, with a minimum of one base station assumed per grid cell.⁴⁰ This approach *entirely ignores the economics of the situation*. Why would a HEO deploy fibre if FWA can achieve suitable coverage at far lower cost? Surely the real-world cost optimisation decisions under UFB and RBI, to deploy fibre to much of the country *but FWA in rural areas*, are relevant indicators of technology choices a HEO can be expected to make?
- C3.9 Network Strategies has tested the implications of Analysys Mason's 'superior' approach. Network Strategies' February 2015 FWA model contained information on building densities in the ESAs sampled. Adopting Analysys Mason's stated 64km² per base station and Zone 4 densities of 0.1 buildings per km², the resulting density of buildings would be below that required for Analysys Mason to deem FWA viable. As a result, Analysys Mason's 'superior' approach to modelling FWA results in no FWA anywhere, and instead fibre being deployed in *all* of the - rural and remote - ESAs Network Strategies sampled. This is absurd, and clearly completely disconnected from the reality of modern FWA technology or New Zealand's geography. We agree with Network Strategies' conclusion that:⁴¹

This is completely unrealistic and suggests that Analysys Mason does not appreciate the geographical conditions in New Zealand. In many sparsely populated rural and remote areas with low customer density, fibre connectivity is simply not feasible due to difficult terrain and geotypes. Consequently Analysys Mason's approach is far from 'superior' and is in fact unrealistic and illogical for an efficient FWA model.

- C3.10 Network Strategies have investigated Analysys Mason's advice on the inclusion of FWA in other regulatory cost models. Given the capability of modern FWA technology, we are not surprised with their observations:⁴²

[...] it is notable that Analysys Mason is providing inconsistent and contradictory advice to different regulators. Earlier this year (in April 2015) Analysys Mason recommended that the Finnish

³⁹ Chorus, August 2015 Submission, paragraph 40 and Chorus, February 2015 Submission, paragraph 82.1.

⁴⁰ Sapere, August 2015 Report, section 7.11.

⁴¹ Network Strategies, September 2015 Review of Submissions, section 2.1.

⁴² Network Strategies, September 2015 Review of Submissions, section 2.1.

Communications Regulatory Authority (Viestintävirasto) use wireless technologies for cost modelling in rural parts of Finland where unbundling is unlikely:

The 2013 EC Recommendation emphasises on numerous occasions (e.g. recital 39, point 31) that a modern efficient network should be assumed. Since at least one Finnish operator has been serving some rural customers with voice/broadband services using wireless technologies, rather than maintaining the legacy wireline technology, it appears that at least some rural parts of Finland are most efficiently served by a wireless technology.

This has disadvantages in that such a technology cannot be unbundled. However, the business case for unbundling in such areas will be weak, and so unbundlers will be unlikely to seek to serve such rural customers [our emphasis]. Therefore, we propose that while use of wireless technology to serve highly rural customers in a bottom-up model is not unreasonable, given the commercial decisions of actual Finnish operators, the definition of where it is used must be developed with care.⁴³

However in New Zealand Analysys Mason has recommended that the Commission does not use FWA at all in its cost model since it cannot be unbundled.

C3.11 Moreover, Network Strategies has identified that Analysys Mason recommended to the Finnish regulator approaches that reflect efficient forward-looking decision-making by the HEO, including these two possible approaches:⁴⁴

- the actual areas that are currently not served by wireline technology, or the areas where the wireline network is planned to be decommissioned, could be obtained from operators and captured in the model (although this would not be entirely consistent with a hypothetical operator and may not accurately reflect potential future deployments)

- more complex algorithms could be used to determine whether it is more cost-effective to serve a location using wireline or wireless technology.

C3.12 The first of Analysys Mason's proposed approaches - identifying areas in which unbundling is not present nor planned and FWA is present or is planned - is very similar to the FWA area selection recommended by Network Strategies. Analysys Mason's second approach clearly recommends cost optimisation. In both cases, the advice is consistent with our continued submissions that the Commission allow the HEO to be in fact efficient.

C3.13 Analysys Mason's advice to the Finnish regulator is in direct contrast to its support of a copper-distance based determinant for the FPP (with the proposed 'superior' adjustment). Moreover, in contrast to its report for Chorus, Analysys Mason does not recommend to the Finns (nor even consider) a distance-based approach to estimating areas served by FWA.

C3.14 With respect to the New Zealand modelling, Analysys Mason argues that the HEO could not use FWA spectrum for other uses. As Network Strategies highlights, this is again illogical. It would make no sense for a FWA operator to purchase nationwide spectrum to serve only 40,833 customers across the country. We think it is obvious that a cost minimising HEO would use spectrum to serve FWA customers in Zones 3 and 4 and would share the cost of this spectrum by also using it for other services in towns and cities. This is precisely what operators, like us, have done in delivering rural services.

⁴³ Analysys Mason (2015), *Survey of the suitability of a bottom-up LRIC+ model for Finland*, 30 April 2015, page 39.

⁴⁴ *ibid.*

C3.15 We agree with Network Strategies' conclusions on submissions made on FWA deployment:

- (a) Chorus' submission supports an unrealistic distance-based deployment criteria that would be illogical for a cost-optimising HEO;
- (b) Analysys Mason's submission differs from Chorus' and furthermore is inconsistent with its own recommendations made to the Finnish regulator.

C3.16 TSLRIC principles require the consideration of efficient costs. An HEO would not deploy fibre in areas in which it makes commercial sense to deploy FWA. We agree with Network Strategies that the Commission must implement what it states, namely that "*FWA should be used for lines where costs are particularly high and unbundling is unlikely*".⁴⁵

C4 Radio propagation footprints are not perfect squares, terrain matters

C4.1 Analysys Mason's recommends that the Commission's FWA analysis should imagine that base station coverage areas are 8kmx8km shapes, creating a grid of adjoining square footprints.⁴⁶

C4.2 FWA base station coverage footprints are not square. Instead, radio planning techniques are performed for hexagonal areas, approximated by circular grid areas, and propagation matters: networks are designed to offer optimal coverage by taking into consideration variations in geography. Analysys Mason's proposed grid of consistently sized adjoining squares does not reflect reality.

C4.3 The Commission requested information from Vodafone on FWA networks. Specifically, in late April 2015 the Commission requested:

*a national average cell radius, being the horizontally distance from a cell site, assuming:
2x20MHz of 700MHz LTE;
Base station capacity of 65Mbits/sec per site;
An average user throughput of 250kbits/sec, from
Vodafone's existing RBI sites.*

C4.4 Vodafone's response included:⁴⁷

.. the information requested by the Commission is not readily available, and may not be suitable for FWA network modelling:

- *The coverage areas of all cellsites are dependent on terrain and other geographical features, and are all of irregular shape, making it nearly impossible to define an average 'cell radius'. It is also not meaningful to provide metrics such as minimum and maximum coverage distance, as such measures wouldn't be representative of the actual area and number of dwellings covered by each site. Annex 1 provides further technical explanation.*
- *Vodafone's RBI network designs were based on UMTS 900MHz, with a target population coverage of only 80% rural customers. The other design specifications were also very different from the fixed replacement requirement. (Vodafone's coverage modelling for the February submission is based on LTE 700MHz, and used Vodafone's whole existing network*

⁴⁵ Network Strategies, August 2015 Report, Section 2.3.2.

⁴⁶ *Ibid*, Section 7.3.1.

⁴⁷ Tamara Linnhoff letter to John Gandy, 18 May 2015: Response to the Commission's Request for Further Information on FWA Networks.

only as a starting point, and added additional sites to meet the 100% coverage requirement). So the theoretical coverage areas calculated based only on Vodafone's RBI cellsites may not represent the requirement to provide 100% FWA coverage to rural areas.

and further:

FWA sites can be described in terms of the actual total square kilometres a cell site covers, and the actual location points of the dwellings covered. We can provide:

- a. the coverage data (e.g. areas covered in km² and addresses coverage per site) for cellsites in the sample areas considered for FWA modelling.*

C4.5 We also warned, and advised:

Using an artificial cell 'radius' is a flawed approach

a simple averaged cell radius is not suitable for FWA modelling. The coverage areas for sites is irregular and assuming perfectly circular coverage areas will generate flawed results - coverage might be assumed in areas with difficult terrain and no dwellings while the actual dwellings that are covered by the cell sites might be missed. Network Strategies' FWA modelling addressed the propagation characteristics of sampled ESAs selected to be representative of average cost ESAs. Average cost outcomes from the sampled ESAs should reasonably reflect the average outcomes for the relevant zones. The use of a simple averaged cell radius will not generate such a reliable estimate of the average outcome for these reasons.

C4.6 Annex 1 of our May letter contained technical information on propagation and FWA footprints, replicated as Box 1 below.

C4.7 Analysys Mason's grids suggest a coverage area of 64km² per base station is appropriate. This is also incorrect – coverage in the LTE 700MHz band is far wider, and moreover our own link budget analysis estimates that cell radius in rural areas should be greater than [REDACTED] VNZCI. This translates to a theoretical coverage area of around [REDACTED] VNZCI which is [REDACTED] VNZCI times higher than Analysys Mason's assumed value.

C4.8 Analysys Mason also suggests that propagation factors mean the Commission's assumed 100% coverage is unsuitable and so suggests the use of additional equipment such as pole mounted antennae outside premises with extra cabling laid to premises. Both the Commission's suggested approach and Analysys Mason's proposed amendments are entirely theoretical. Neither attempt to apply radio engineering design techniques to solve the problem.

Box 1: Vodafone's response to the Commission's request for information on 'national average cellsite radius'

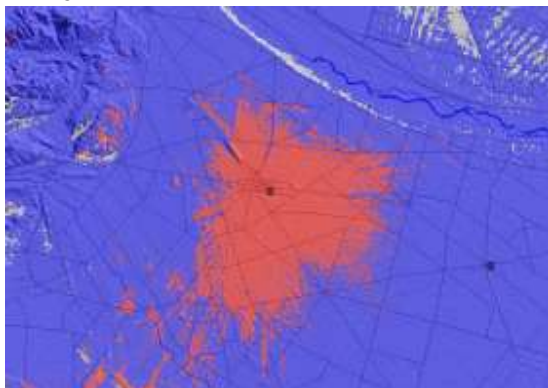
A cell site's actual coverage area and shape vary drastically depending on cellsite location and the surrounding terrain. In Vodafone NZ's hypothetical FWA modelling for the copper pricing review, each site's location was individually identified or determined, and its coverage predictions generated by the planning software to ensure the predicted coverage was accurate. Creating a nominal radius and using this to plan/place or estimate a required number of cellsites is not a practical nor accurate method. There are several reasons for this, including site-specific variations in coverage pattern and overlapping cellsite coverage area.

Coverage pattern (Shape):

- The coverage pattern of each cellsite varies depending on the terrain and clutter in the environment. Different geographical features and clutters on the ground will affect radio propagation differently. For example, radio waves can travel quite well across open grassy plains, but will not propagate well in hilly environments with dense vegetation, so every cellsite has a coverage pattern that is unique. New Zealand has a very diverse geography, which is why four sample geotypes from across New Zealand were modelled in the February submission.
- The following graphs demonstrate coverage patterns of cellsites in different geographical areas. It can be seen that such patterns vary greatly and cannot be generalised using simple shape or distance. (It can be seen that even in a flat terrain like the Canterbury Plains the coverage of a cellsite is not a circular shape so a 'radius' is not an accurate representation of cellsite coverage)

Canterbury Plain: Predicted site coverage

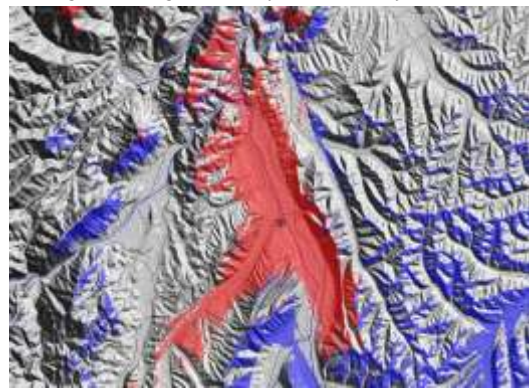
Coverage is distributed across the fields on flat farmland area



CellSite:
Coverage by a single cell site
Coverage by surrounding cell sites

Nelson hills: Predicted site coverage

Coverage extending down valleys but limited by hills

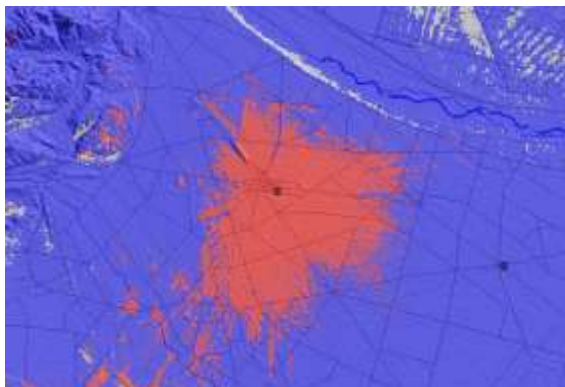


CellSite:
Coverage by a single cell site
Coverage by surrounding cell sites

Overlapping coverage area: A cellsite's coverage area is also difficult to define because cellsites typically have overlapping areas. This is a feature of such networks, as coverage boundary is defined by signal strength, not by geo area. Often a strong signal from a nearby cellsite may impact greatly the shape and size of coverage area of another cellsite.

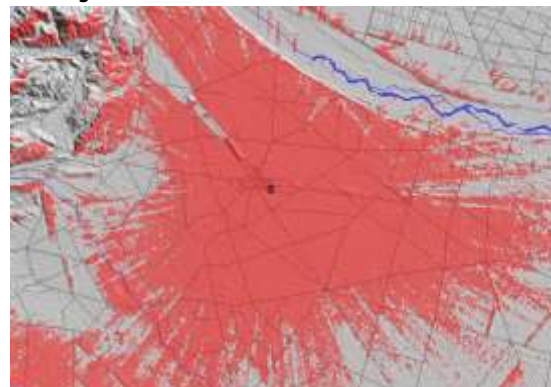
The diagrams below illustrate the coverage boundary of a site due to signal dominance, comparing to the boundary of its coverage level limit.

Coverage boundary of a Canterbury Plain site due to signal dominance



CellSite:
Coverage by a single cell site
Coverage by surrounding cell sites

Coverage boundary of a Canterbury Plain site due to coverage level limit



CellSite:
Coverage by a single cell site
Coverage by surrounding cell sites

C4.9 In summary it is not practical to create a simple coverage pattern and coverage area for cellsites as the coverage is greatly affected by the environmental factors and signal from other cellsites. For these reasons Vodafone uses sophisticated prediction software with detailed terrain information to calculate the coverage of individual cellsites. Vodafone does not use “average cell radius” or similar for network planning purposes.

C4.10 In contrast to the Commission’s approach and Analysys Mason’s ‘superior’ proposals, Network Strategies’ FWA method is based on actual radio engineering design that was carried out by professional radio engineers, using real-world design software and the actual topography information for the ESAs that were considered. Equipment was added as necessary - based on actual geography - to achieve 100% coverage:⁴⁸

To mitigate any coverage problems that may arise for existing base stations (resulting in insufficient signal strength at the customer premises), the RF planning (performed for our cost model) adds extra base stations and repeaters which ensure that adequate signal strength is received by all customers. The costs of these base stations and repeaters have been included in our FWA cost model results.

C4.11 Network Strategies’ FWA model addresses typical propagation constraints by considering four geotypes to account for difference in regions, terrain and customer densities. The geotype approach is absolutely standard when designing a cost modelling approach that can be accurately extended to an area larger than the sampled size, and allows for the model results to be appropriately extended taking into account both the different types of New Zealand geography, and the relative proportion of the whole that each geotype represents.

C4.12 The Commission must not adopt the Analysys Mason approach, and should instead apply the Network Strategies’ FWA approach which addresses coverage and availability issues in both the network planning and costing.

C5 Number of base stations

C5.1 In response to the Commission’s assumed number of FWA base stations, Analysys Mason carried out a review of the distribution of road sections served by FWA in the Commission’s model. Analysys Mason concluded that the FWA sites in the Commission’s model would not provide coverage over these road sections. Instead, they propose an almost 7-fold increase in the number of base stations (from 207 to 1,447) to cover the Commission’s selected area (recalling of course that the Commission’s area was determined by copper line distance from the exchange). We support Network Strategies’ conclusion that “*in fact Analysys Mason’s recommended number of base stations supports our stand because it represents an unrealistic and inefficient deployment, not compatible with the efficiency required of the HEO.*”⁴⁹

C5.2 Vodafone’s RBI Phase 1 network is projected to soon cover 250,000 buildings. This is based on 530 sites.⁵⁰ It is simply incorrect to assume that a HEO – even one that offers 100% rural coverage – would need to deploy almost three times as many sites as Vodafone does, to achieve just 16% of the same coverage. Moreover, as we have previously submitted, the Commission’s FWA deployment would more efficient than Vodafone’s initial FWA deployment as the Commission’s HEO deploys LTE technology in the 700MHz band, which delivers superior

⁴⁸ Network Strategies, March 2015 Review of Submissions, Section 2.4.

⁴⁹ Network Strategies, September 2015 Review of Submissions, section 2.3.

⁵⁰ Vodafone (2014), *RBI flyer*, available at <http://www.vodafone.co.nz/cms/documents/1375774069267/>.

performance compared to 3G technology in the higher spectrum bands which was used initially for RBI (this is reflected in Vodafone's actual experience, as we deploy 4G services to rural New Zealand).⁵¹

- C5.3 Network Strategies present a useful comparison of customers, base sites and customers per site across Vodafone's RBI sites, the Commission's December and June FWA approaches, and Analysys Mason's proposed amendments. They observe:⁵²

We do not believe that the number of base stations suggested by Analysys Mason could represent an efficient operator's network. In fact if 1 447 sites are used to serve 40 833 customers, there will be an average of 28 customers per site rather than the 472 customers per site for RBI deployment. This will result in extremely high costs – a simple cost analysis suggests the total FWA annual cost would be around [REDACTED] CNZCI million (for 1 447 sites) rather than [REDACTED] CNZCI million (for [REDACTED] CNZCI sites). This translates to an annual cost of [REDACTED] CNZCI per customer which is significantly higher than Commission's corresponding value of [REDACTED] CNZCI per customer.

Thus Analysys Mason's recommendation of increasing the number of base stations to serve FWA end-users delivers unrealistic costs for an HEO. In fact this recommendation further supports our position that the underlying issue in the Commission's modelling is that it applies an incorrect approach to determine which customers are served by FWA.

C6 Conclusion

- C6.1 Analysys Mason's recommendations to the Commission would serve only to further compound the existing inefficiencies in the Commission's approach. Analysys Mason's recommendation that the Commission massively increase in the number of base stations to serve FWA end-users is utterly divergent from the concept of a HEO.
- C6.2 The number of FWA customers in the Commission's model cannot be based on distance from the exchange but should reflect a HEO's efficient network design. Analysys Mason's own map of FWA locations in the Commission's model demonstrates that the selection of FWA customers based on distance from the exchange results in an unrealistic spread of FWA customers. Instead, an HEO should be assumed to deploy FWA in all Zone 3 and 4 ESAs in which unbundling is unlikely, as would be consistent with current real-world FWA deployment. Analysys Mason's advice to the Finnish regulator, that wireless technologies should be used when cost modelling areas where there is unlikely to be a business case for unbundling, must be heeded.
- C6.3 The Commission must design an HEO to be more efficient than both the HEO in its July draft determination and that proposed by Analysys Mason. A HEO would, by definition, deploy FWA to customers in all (current and planned) non-unbundled ESAs based purely on a cost optimisation exercise. Thus we strongly recommend the Commission cease disregarding Network Strategies' cost modelling for FWA, which is:
- (a) anchored on real-world radio engineering FWA network design modelling;
 - (b) accounts for complex terrain and propagation factors yet achieving 100% coverage; and

⁵¹ Network Strategies, February 2015 Report: *Modelling Fixed Wireless Access*, section 2.2.2.

⁵² Network Strategies, September 2015 Review of Submissions, section 2.4 Exhibit 2.2.

- (c) includes microwave backhaul reflecting real-world technology choices (and costs) for backhaul in remote areas.

C6.4 Network Strategies' FWA model has been designed to append onto TERA's cost model. The Commission must accept this approach. We repeat again our suggestion that if the Commission is reluctant to adopt this modelling without further verification of the engineering and cost modelling carried out, it should procure independent peer review. We would also be happy to arrange this.

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| Recommendation 3 | Implement an analysis consistent with the Commission's own statement: 'FWA should be used for lines where costs are particularly high and unbundling is unlikely'. The Commission should adopt FWA for users in all Zone 3 and 4 areas where there is no current unbundling and future unbundling is unlikely, and adopt Analysys Mason's recommendation of wireless technologies in areas where there is unlikely to be a business case for unbundling. |
| Recommendation 4 | Adopt actual, best-practice, capacity information in place of the currently used throughput demand driver of copper capacity. As copper throughput capacity is meaningless in for a HEO's fibre and FWA network: fibre throughput does not degrade with distance. |
| Recommendation 5 | Adopt actual, best-practice, FWA coverage that reflects the laws of physics: radio signal is not limited by map boundaries and FWA sites are not perfectly formed square footprints. Ensure base stations are sited as needed, so based on actual topography of the geotype. |
| Recommendation 6 | Adopt Network Strategies' FWA model as a workable solution that can be applied to all non-unbundled areas, as this is based on actual terrain and propagation conditions in New Zealand and reflects the cost optimisation decision of a HEO deploying FWA in areas where it is feasible and economical. This FWA model is designed to append to TERA's cost model. |

D Non-recurring charges

D1 Introduction

D1.1 The Commission must identify how a hypothetically efficient operator will undertake non-recurring tasks using forward-looking efficient techniques and costs. The Commission has chosen to apply a top-down efficiency adjustment to Chorus' actual charges to determine the non-recurring charges (NRCs) of a HEO, as set out in the draft decision.

D1.2 TERA's international benchmark is, in principle, an appropriate approach. Nonetheless efficiency adjustments must be made to the benchmarking calculation. The Commission has applied a limited efficiency adjustment to only one of seven elements of cost, namely 'time' budgeted. The Commission ignores other efficiency adjustments on the basis that the components are specific to each country and can therefore not be subject to international benchmarking. No efficiency adjustment has been undertaken for the service company overhead costs or Chorus' own overhead costs. WIK-Consult identify that "significantly less than 50% of the service

transaction costs have been checked for efficiency in the adjustment approach of the Commission”.⁵³

- D1.3 This approach can be contrasted to Chorus’ submissions, which derive from the central proposition that the Commission ought to adopt Chorus’ actual costs. We strongly reject this proposition: Chorus’ current processes are not efficient. They are, therefore, unsuitable as evidence of a HEO’s costs. Chorus’ proposed revisions to the Commission’s approach to NRCs would not lead to efficient costs.
- D1.4 Chorus and Analysys Mason’s submissions attempt to undermine the benchmarking methodology applied by the Commission. WIK-Consult present a detailed critique of this analysis, demonstrating that it does not show the Commission’s benchmarking to be inappropriate.
- D1.5 In contrast to Chorus, we support the benchmarking approach as a second best option (after the first-best approach of bottom-up cost modelling). We note, as do WIK-Consult in their own report, that Analysys Mason themselves recommend a deep process analysis to allow a bottom-up approach and improve the estimation of NRC based transaction services.⁵⁴
- D1.6 Whilst a bottom-up analysis would be optimal, we recognise that benchmarking is likely to be the only feasible acceptable method to assess NRCs within the Commission’s available timeframe. In contrast, if Chorus’ costs, and its suppliers’ costs, are to be the starting points for the Commission’s analysis, then substantive and evidence-based efficiency adjustments will need to be made.

D2 Chorus ignores potential efficiency improvements by a HEO

- D2.1 Chorus’ submission ignores the potential for efficiency improvements that a HEO would achieve, and moreover appears to overlook its own public statements in relation to efficiency improvement efforts in non-recurring processes.
- D2.2 Chorus argues that, given service companies are engaged via a competitive tender process, the contractually agreed service costs must be efficient. This is too simplistic. Whilst we agree that a competitive tender process will aim to arrive at efficient costs, the fact a tender takes place is not sufficient to ensure efficiency. Efficient contract cost levels would also require that all service companies’ own processes, and interactions between all service companies and the contracting company (in this case, Chorus) are also efficient. Evidence provided by WIK-Consult in their August 2015 report strongly suggests Chorus’ underlying processes are not efficient.⁵⁵
- D2.3 Chorus similarly argues that because the RSPs who buy NRC-related services from Chorus also contract directly themselves with the same service companies, these costs must be efficient.⁵⁶ The fact both Chorus and RSPs contract with service companies is an irrelevant point. A service company may charge differential rates across its customers. More importantly, charges being the same does not lead to the logical conclusion that costs are efficient.

⁵³ WIK-Consult, August 2015 Report, section 3.

⁵⁴ Analysys Mason, August 2015 Report, Section 6.1.

⁵⁵ WIK-Consult, August 2015 Report, Section 3.6.

⁵⁶ Chorus, August 2015 Submission, page 17.

D3 Chorus does not minimise fault handling costs

- D3.1 We share WIK-Consult's view that as the single provider of network access infrastructure, Chorus is not incentivised to ensure fault handling is efficient.
- D3.2 At present, whilst Chorus can identify the reasons for a fault, RSPs have limited ability to identify the party that has caused a fault, themselves or Chorus. Moreover, if a potential fault is raised with Chorus but then no fault found, RSPs must still pay a 'no fault found' fee of \$84.40 (UCLL) or \$76.30 (UBA). As Chorus receives a payment to cover its costs it clearly has no incentive to optimise efficiency and minimise the frequency of faults.

D4 Chorus' 'corrections' to TERA's efficiency adjustments on benchmarked values are neither complete nor compelling

- D4.1 Chorus' submission, responding to TERA's international benchmarking approach to determining the costs of an efficient HEO, is neither conclusive nor compelling. Its conclusions should be rejected.
- D4.2 Chorus submits that the identification of comparable activities, against which to benchmark, is difficult. However this position ignores that activities may differ across countries precisely due to efficiency improvements already enacted by some telecommunications providers. Thus differences in processes or activity descriptions may be a clear indicator of efficiency differentials.
- D4.3 Analysys Mason raise the trade-off between task duration and labour cost. As WIK-Consult highlight, the duration of activities depends on labour cost and also on factors such as process efficiency, IT systems and techniques and tools used for practical work. And so if a comparator country has faster service delivery times and lower costs, contrary to Chorus' claim, TERA's benchmark may be an underestimate of achievable efficiency.
- D4.4 Chorus' claim that New Zealand-specific circumstances mean true NRCs are above TERA's benchmark is unsubstantiated. Chorus claim "[t]here are a number of New Zealand specific factors that may drive higher average task times for certain non-recurring charges than other countries" and list examples of New Zealand specific circumstances, but offer no evidence that these circumstances drive higher task times.
- D4.5 The reasons Chorus propose for higher task times in New Zealand than in Europe are easily rebutted. For example:
- (a) Standards of workmanship cannot be claimed to be higher in New Zealand. Not least as European regulators often supervise the incumbent's reference offers; and
 - (b) In Europe, third parties often provide services to RSPs as an efficiency enhancing approach, which is not substantially different to the New Zealand context.
- D4.6 We share WIK-Consult's concern that, despite Chorus' claims that TERA's NRC benchmarks are overestimates, Chorus' own stated task times are simply estimates rather than derived from a bottom-up process analysis. As Chorus concedes:⁵⁷

⁵⁷ Chorus, August 2015 Submission, para. 355.

[...] the cost component breakdowns provided to the Commission are estimates, gathered for the purpose of informally benchmarking service company proposals rather than for the purpose of obtaining actual data about task completion rates.

- D4.7 Chorus point to variations in task time as evidence of in-comparability across countries. We agree with WIK-Consult that the opposite is more likely to be true: time differentials are more likely to reflect differences in efficiency requirements set by a particular national regulatory authority. This view is based on WIK-Consult's experience across European regulatory processes, as in general, NRCs offer significant capacity for efficiency improvements.
- D4.8 Chorus' own statements reveal that current NRCs are purposefully set above an efficient level to incentivise particular behaviour by RSPs.⁵⁸ Finally, we note WIK-Consult's response to Chorus' claim that WIK-Consult's own statements, made at the Commission's FPP conference, support the selection of a benchmarking value above the mid-point. We agree with WIK-Consult's view that Chorus has taken WIK-Consult's - and Network Strategies' statements out of context. In fact, WIK-Consult support TERA's selection of the lowest benchmarked value. The Commission is modelling an HEO. The efficiency requirement clearly means the HEO is located *at least* on the efficiency frontier of a sample of operators, and not at an average value somewhere between the most and least efficient.

D5 Chorus' suggested amendment to TERA's weighting service costs per CSA is inappropriate

- D5.1 TERA's current approach, which uses a CSA's line volume as the relevant weight when averaging charges across all New Zealand CSAs, fairly allocates the risk of changing costs across Chorus and RSPs. It is, therefore, appropriate.
- D5.2 In contrast, Chorus' proposed percentile approach fails to replicate the risk-sharing expected in a competitive market. As WIK-Consult highlight, Chorus' argument is one-sided, and focusses on the risk to Chorus of an underestimation. Chorus neglect to recognise that RSPs (and ultimately end-users) also bear a risk of the Commission arriving at a rate above true cost.
- D5.3 We support WIK-Consult's conclusion that TERA's current approach, which allows for significant future changes to drive an amendment to the NRC calculation, adequately simulates the outcome expected in a competitive environment.

D6 Chorus' assertion that its real overhead costs are efficient is unsubstantiated

- D6.1 Chorus argues that the Commission must recognise service company overheads. We do not agree. Instead, we endorse WIK-Consult's critique that "[t]he problem with this argument of course is simple: real world costs do not necessarily reflect efficient costs".⁵⁹ No evidence is provided by Chorus nor Analysys Mason that actual overhead costs reflect the efficiency frontier. We share WIK-Consult's concern that "*service company overhead costs are inflated and do not*

⁵⁸ Chorus, August 2015 Submission, para. 360f.

⁵⁹ WIK-Consult, September 2015 Review of Submissions, section 5.4.

reflect efficient costs.⁶⁰ Furthermore, we have shown that "real world costs" in New Zealand can be well be lower than assumed in TERA's costing approach."⁶¹

D6.2 Analysys Mason states that Chorus' overhead costs are fixed costs and ignores the potential for Chorus to make efficiency improvements over time. This position is a violation of a key TSLRIC concept: that all costs are variable in the long run. Analysys Mason provides no explanation for this.

D6.3 We highlight again WIK-Consult's evidence showing Chorus' overhead costs are significantly inflated, due to in part to outdated cost data and to an outdated IT infrastructure which drives inflated IT and labour costs.⁶²

D7 NRC-related costs should not be inflated using a benchmark value from LFCs

D7.1 Chorus argues that LFC data should not be used as a cross-check on the Commission's NRCs relating to a copper network. In this instance, we agree. NRC activities for copper and fibre networks differ significantly, and so a comparison between an internationally benchmarked value and LFC activity costs is not justified. Fibre and copper connection activities significantly differ for reasons including:

- (a) *Material:* A copper ("jumper") wire is far lower cost than a fibre patch cable.
- (b) *Labour for connection:* Connecting a simple copper wire is fast: a small copper roll is unwound to the required length, cut and clamped in place. A fibre patch takes longer: the correct length and size of a patch cable must be identified, then plugged into ports at both ends. A preconfigured patch cable that includes connectors is required in advance. If no appropriately fitting patch cable is to hand, the engineer must prepare one, which takes time.
- (c) *Labour needed for functionality test:* A copper jumper is fit for purpose after clamping. Fibre functionality testing takes longer: fibre cables are calibrated after connection using special equipment. The equipment also represents an additional cost compared to copper.
- (d) *Customer premises are often unprepared for fibre networks:* which is the main reason fibre deployment ends at the street section. Thus fibre connections usually require additional in-house wiring, ODF installation, lead-in and activation, all of which takes time and adds cost. Almost all existing buildings already support a copper connection.

D7.2 WIK-Consult provide useful evidence of the differential between copper and fibre connection costs in Germany. Fibre connection costs are at least twice the cost of a copper connection.

D7.3 Fibre connections are still in the 'learning' phase in New Zealand. Chorus reports that some customers have "really bad experiences" with fibre connections, including about 30% of installation appointments being cancelled on the day.⁶³ It is currently recognised across the

⁶⁰ WIK-Consult, August 2015 Report, Section 3.6.3.

⁶¹ WIK-Consult, September 2015 Review of Submissions, section 5.4.

⁶² WIK-Consult, August 2015 Submission, Section 3.6.4.

⁶³ See recent media <http://www.stuff.co.nz/business/industries/68875282/Chorus-hopes-to-connect-homes-to-UFB-on-Saturdays>.

industry that fibre connection processes are not yet efficient, and a working group, supported by MBIE officials and the Minister, is working to collaboratively address the issues. Chorus have announced a programme of actions to improve fibre connection efficiency, including a focus on the customer experience.⁶⁴

D7.4 We do not accept it could be reasonable to assume LFCs are already far more efficient than fibre at connecting fibre customers. Thus the cost of fibre connections for LFCs cannot be used as an efficiency benchmark for the HEO's fibre connections. We share WIK-Consult's view that the Commission must not persevere with a cross-check of HEO NRC values using New Zealand benchmarked costs. Thus we also reject Chorus's proposal that the Commission treat the LFC cost benchmark as relevant.

D8 Several transaction services are clearly caused by Chorus inefficiencies and cannot be attributed to a HEO

D8.1 Chorus' systems facilitating NRC-related activity are not efficient. IT systems could be better optimised to ensure all parties hold necessary information, reduce unnecessary truck rolls and communicate relevant new information to all necessary parties in real time.

D8.2 We agree with WIK-Consult that transaction services such as 'manual prequalification order', 'manual line testing' or results that are conveyed such as 'no fault found' are suboptimal and caused by Chorus process inefficiencies, aging network components and by Chorus' chosen approach to network renewal and maintenance. Such charges cannot be adopted by the Commission into the HEO's costs.

D9 A moderate price reduction factor of -3% to -5% p.a. should be applied to NRC based transaction services

D9.1 Chorus and Analysys Mason support the Commission's adjustment for changes in the labour cost index in the NRC cost. We agree. However our view goes further: the Commission must treat all influencing cost components that change over time equally. And so if task times, IT costs, transport costs or process and productivity improvements arise, NRCs should be adjusted accordingly.

D9.2 We support WIK-Consult's proposal that:⁶⁵

In total we expect an annual cost reduction and therefore we suggested a moderate price reduction factor of -3% to -5% p.a.⁶⁶ This moderate factor already considers the change of labour costs. It is supposed to represent the net effect of labour cost (increase), the change of cost of other input factors (which might increase or decrease) and the increase in process efficiency and productivity. It is a moderate factor, if compared to the change in the (regulated) costs of transaction services in other jurisdictions, which we presented in our October 2014 Submission and our August 2015 Submission.

⁶⁴ WIK-Consult, August 2015 Report, para. 156.

⁶⁵ WIK-Consult, September 2015 Review of Submissions, section 5.7.

⁶⁶ WIK-Consult, August 2015 Report, para. 91.

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| Recommendation 7 | Reject Chorus' submission on NRC efficiency adjustments as this ignores potential efficiency improvements, locates a HEO off the efficiency frontier, and also ignores Chorus' own public statements and industry-wide programmes to improve NRC efficiencies. |
| Recommendation 8 | Retain TERA's international benchmarking approach and adapt this to account for efficiency improvements. |
| Recommendation 9 | Retain TERA's current approach of weighting service costs per CSA by volume of lines. Reject Chorus' percentile approach. |
| Recommendation 10 | Reject Chorus' argument that real overhead costs reflect efficient overhead costs. |
| Recommendation 11 | Do not inflate NRC related costs by using benchmarked LFC values. |
| Recommendation 12 | Reject Chorus' submission that actual costs are efficient: transaction services such as 'manual prequalification order', 'manual line testing' or communicated results like 'no fault found' are the result of Chorus' inefficiencies. |
| Recommendation 13 | Apply a moderate price reduction factor of between -3% and -5% per annum to NRCs to reflect both changes in labour costs and further efficiency improvements that are realistic within the forthcoming regulatory period. |

E Further modelling concerns

E1 Introduction

- E1.1 WIK-Consult and Network Strategies' reports contain detailed responses to further submissions made by Chorus and Analysys Mason.
- E1.2 In this section, we provide a brief overview of the key points raised by WIK-Consult and Network Strategies, and for full details we direct readers to their full reports, submitted alongside this submission. We fully support the analysis carried out by WIK-Consult and Network Strategies, and share the conclusions reached.

E2 Geospatial issues

- E2.1 TSO connections that existed in December 2001 included also customers connected via Multi Access Radio (MAR), which is typically deployed in difficult terrain. TERA's modelling proposes a HEO would serve customers, who are currently connected via MAR, by fibre. Given the high cost of connecting these customers, we do not agree with Chorus' statement that all TSO connections that existed in December 2001 must be included in the modelling, regardless of technology and broadband availability.⁶⁷ We think that it is obvious that a HEO would not serve current MAR customers with fibre.

⁶⁷ Chorus, August 2015 Submission, paragraph 74.

- E2.2 Analysys Mason have carried out an analysis of the distribution of road sections, and argues that the Commission's assumed FWA base stations could not cover these road segments. However as the underlying distribution of customers is already unrealistic from a network planning perspective (it isn't consistent with efficient deployment of FWA technology), in serving unbundled customers with FWA the Commission has already violated its own principles. Any FWA network design to cover these customers will be unrealistic and thus overestimate costs.
- E2.3 Analysys Mason claim TERA's mapping of buildings does not map buildings to the closest road segment. We note Network Strategies' finding that this modelling issue does exist, and thus suggest the Commission direct TERA to correct this error.

Recommendation 14 Reject Chorus' statement that all TSO connections that existed in December 2001 (so including multi access radio connections) must be included in the modelling, regardless of technology and broadband availability.

E3 Modelling UCLL and UBA

Introduction

- E3.1 WIK-Consult have previously submitted on significant opportunities to optimise the network design for UCLL and UBA, and in particular noting that appropriate TSLRIC modelling would incorporate optimisation of the core network, MDF locations, as well as network nodes in the access network.⁶⁸ By scorching to MDF and FDS nodes, and using a simple shortest path per fibre calculation, the Commission's model misses significant opportunities for optimisation that would be expected in a best-practice TSLRIC model.
- E3.2 In this section we provide an overview of WIK-Consult's responses to Chorus and Anlysys Mason's submissions on UCLL and UBA network design and dimensioning.

The claims that trench and lateral lengths are underestimated are unsubstantiated

- E3.3 Chorus and Analysys Mason claim TERA underestimate trench lengths. WIK-Consult demonstrate that the arguments put forward are unsubstantiated, incorrect and/or would represent an inefficient network deployment technique and also inconsistent with actual deployment standards in New Zealand. We agree with WIK-Consult's view that much of the arguments on trench length on lead-ins are irrelevant as lead-ins are customer-funded and so cannot be included in the HEO's cost base.
- E3.4 Chorus and Analysys Mason argue that lateral lengths are underestimated as lead-ins to the end-customer homes are ignored. However the cost of these elements is already overestimated as these are included in the costs of street crossings. Furthermore, the New Zealand Road Deployment Standards require the horizontal parts of distribution lines to be deployed as close as possible to the property, as has been confirmed by Downer. If correctly implemented this approach to deployment will reduce the lateral length claimed by Chorus and Analysys Mason to almost zero.

⁶⁸ WIK-Consult, August 2015 Report, sections 5.3 and 6.3.

Asset re-use is under estimated

- E3.5 The Commission must assume a HEO will re-use relevant existing network assets. Chorus has publicly announced a target of 40% of its UFB deployment to be via re-used ducts. This statement should also inform re-use of other assets including poles. Assuming 40% as a reasonable re-use parameter WIK-Consult estimate a 13.8% saving in UCLL deployment costs for 2016, and a 14.3% saving for 2020. This is significantly above the 9% saving calculated by TERA.

Lead in costs must not be included

- E3.6 Chorus continue to submit that end-user contributions for lead-ins and subdivisions should be included as a cost borne by the HEO. We agree with WIK-Consult's continued dismissal of this claim, and also note Chorus's own instructions to contractors (at March 2015): *"Our network is typically built up to the boundary of the property... The lead-in is the property's owner responsibility and can be installed by an electrician or builder."* This is not an ambiguous statement, clearly Chorus does not bear this cost. If the Commission attributes such costs to the HEO it will be double counting.

UBA Network Optimisation

- E3.7 The Commission has not optimised the UBA network design.⁶⁹ In particular, WIK-Consult observe that the wholesale bitstream access service is necessarily only one product alongside others delivered on the same platform. From an efficiency service, it is essential to take into account the synergies and cost-sharing with these services (otherwise the regulated service will simply cross-subsidise unregulated services).
- E3.8 Chorus and Analysys Mason submit that the Commission must include additional costs to cover a number of aspects of UBA network design elements. WIK-Consult have demonstrated that these proposals have either been considered by TERA (such as design and testing costs) or do not represent efficient behaviour (such as the proposed use of VDSL splitters). We agree with WIK-Consult's rejection of Chorus' claim that a HEO would install redundant (sub-)rack capacity.

Recommendation 15 Ensure appropriate network optimisation in the core network, MDF locations, and the access network through ensuring an appropriate "bottom up" approach to network design and taking into account opportunities for efficiency gains and sharing between services.

Recommendation 16 Ensure double counting of lead-in contributions does not occur.

E4 Trenching cost analysis

- E4.1 Chorus relies on Analysys Mason's analysis - of its own actual trenching costs for UFB and RBI projects - to assert that 'optimised national average trenching costs' are significantly higher than trenching costs assumed by the Commission.⁷⁰

⁶⁹ WIK-Consult, August 2015 Report, at section 6.3.

⁷⁰ Chorus, August 2015 Submission, Executive Summary.

E4.2 Network Strategies have reviewed the input data, and the statistical model and spreadsheet model presented by Analysys Mason, and find:

- (a) That whilst Chorus and Analysys Mason claim trenching cost data was derived from years 3 and 4 of the UFB and RBI programmes only⁷¹ (to avoid encompassing the 'learning' inefficiencies of the earlier programme years), this is actually not the case: RBI project data from throughout the programme, so from all five years to date, has been included.
- (b) UFB cost data includes four main cost components: a per meter trenching rate, reinstatement rate, drilling and thrusting rate and lateral costs. A mark-up for overheads is allocated to each of these per meter rates. However, Analysys Mason then also includes per meter costs for 'other project costs' and 'design costs', which raises questions of potential double counting. However lack of cost category definitions means this suspicion cannot be checked.
- (c) RBI cost data is derived from 8 cost component categories. Network Strategies raise queries on the treatment of cost allocations, the appearance of negative costs, unexplained differentials in percentage mark-up to the costs for contractor overheads across cost categories, and potential double counting given the existence of both a mark-up for 'contractor overheads' and a standalone cost category for third party contracts. Moreover, the design cost uplift applied to UFB projects is substantially above the median per meter design cost. Analysys Mason's UFB costs do not reflect real world complexities and would appear to overestimate costs.
- (d) Analysys Mason use actual data for some areas and model costs for other areas. The ESAs selected are not representative of the distribution of urban and rural ESAs and thus actual cost inputs are unlikely to be representative, leading to a high margin of error.
- (e) Input data for road lengths contains multiple errors, rendering the proportions of road by rock type, road type and clutter type entirely unreliable.
- (f) The estimation of parameter values for the statistical model is fundamentally flawed due to the repeated violation of a key assumption of the model: that the sums of the proportions of clutter, road and rock definition types must be one. However this proportional rule does not hold for input proportions for road and road types, which do not sum to one. This is a serious issue that affects the estimated model parameters, and so Network Strategies advise that "*any results from Analysys Mason's analysis will therefore be misleading and therefore its model should not be used.*"⁷²

E4.3 Thus, whilst Analysys Mason presents its statistical analysis of trenching as proof that the trenching costs produced by the Commission's model are too low, we share Network Strategies' view that this statistical analysis is unsound. The results cannot be used to assess how the Commission's trenching costs compare with Chorus' real-life costs.

⁷¹ Chorus, August 2015 Submission, paragraph 91, and Analysys Mason, August 2015 Report, sections A.2.3 and A.2.5.

⁷² Network Strategies, September 2015 Review of Submissions, section 4.4.

- E4.4 WIK-Consult have also reviewed the Analysys Mason response and conclude that it significantly overestimates trenching costs.⁷³ WIK-Consult strongly recommend that Chorus and Analysys Mason's arguments for including additional trench costs are rejected as they:
- (a) are demonstrably already included (and, in WIK's view, often over-estimated in the existing model), such as cost categories which are in fact already counted within BECA's average costs estimates (i.e., arborist and traffic management costs);
 - (b) are not reflective of efficient network design or deployment choices (i.e., when efficient deployment techniques, as proposed by Downer, are applied then the Chorus and Analysys Mason's lateral length estimates reduce to almost zero); and
 - (c) in the case of the UFB fibre deployment costs, include a number of demonstrable inefficiencies which would not be expected of an HEO and which ignore the opportunity for the potential to deploy more modern trenching techniques.

Recommendation 17 Disregard Analysys Mason's trenching cost analysis, as both the input costs and the statistical methods are unsound.

E5 Aerial infrastructure

- E5.1 Network Strategies have assessed Chorus' submissions on the proportion of aerial deployment assumed for the HEO and associated costs, and explain:
- (a) Chorus appears to have misunderstood the Commission's approach to aerial deployment, as Chorus confuses the Commission's methodology for defining areas in which the HEO would deploy aerially with the extent of actual real-world pole use. We note also Analysys Mason's recent advice to the Finnish regulator that close to 100% of existing poles are likely to be available to a HEO for reuse.⁷⁴
 - (b) Chorus' suggested approach to assessing pole costs proposes using average charges, rather than the lowest cost, thus ignoring that the HEO is efficient. And the approach suggested would lead to double counting of pole replacement costs.
 - (c) Chorus' values for obtaining resource consent, monitoring and consent compliance are not forward looking, not efficient and moreover ignore the expected imminent changes in the regulatory framework for telecommunication facilities that will make consenting faster and lower cost.⁷⁵
- E5.2 WIK-Consult also comment on Chorus' submissions on aerial deployment:
- (a) Contrary to Chorus' claim that aerial cabling can be deployed only in areas with existing EDB cabling, WIK-Consult advise a HEO could deploy aerial cabling alongside existing EDB

⁷³ WIK-Consult, September 2015 Review of Submissions, section 2.2.

⁷⁴ Analysys Mason (2015), *Survey of the suitability of a bottom-up LRIC+ model for Finland*, 30 April 2015. Page 61.

⁷⁵ Ministry for the Environment (2015), *Proposed Amendments to the National Environmental Standards for Telecommunication Facilities: Discussion Document*, March 2015, page 6.

aerial infrastructure (to overcome physical limitations on pole leading), or indeed 'everywhere' it made sense to do so.

- (b) In response to Analysys Mason's claim that aerial deployment requires an additional pole on the minor side of a road,⁷⁶ WIK-Consult repeat their previous submissions that this is not accurate,⁷⁷ as building height is sufficiently high to affix the crossing cable whilst still ensuring adequate road clearance for high vehicles. It's useful to note Downer's comment - that the average distance between building and boundary is about 14 m⁷⁸ - and so an additional pole would be superfluous. WIK-Consult explain that erecting an additional pole on minor road side is not state-of-the-art practice in any aerial deployment that they are aware of in other countries.

E5.3 We share WIK-Consult's view that Chorus' arguments for reducing the proportion of the HEO's aerial cabling are unsupported by overseas experience, misleading, and irrelevant. And instead, smaller and lighter fibre access lines are likely to be more acceptable for aerial deployment by locals and consenting authorities than larger power lines, given the recognised trade off if achieving fibre broadband at a lower cost.

E5.4 Thus the Commission's proposal for a HEO to deploy 2% less aerial than the EDBs is insufficient, and instead the HEO's share of aerial deployment could feasibly be higher than current EDB's share of aerial.

Recommendation 18 Reflect evidence from LFCs that indicates that aerial deployment is used wherever possible since aerial reticulation is more cost-effective than undergrounding. Acknowledge that a HEO could feasibly achieve aerial deployment above the level of EDBs.

E6 Price trends

E6.1 CEG's report for Chorus proposes the Commission apply 'bespoke' indices for price trends rather than following NZIER's advice to use Statistics New Zealand Producers Price Index (PPI) for outputs of the heavy and civil engineering construction sector, or the Capital Goods Price Index (CGPI) series used by Beca.

E6.2 Network Strategies have examined this submission and conclude the price trend indices constructed by CEG are deficient as:

- (a) the use of historical data and forecasts violates a key TSLRIC requirement that costs are forward-looking; and
- (b) weightings applied are not supported by evidence to suggest they reflect an efficient operator.

⁷⁶ Analysys Mason, February 2015 Report, Section 2.6.

⁷⁷ WIK-Consult, March 2015 Review of Submissions, para. 135.

⁷⁸ Downer, August 2015 letter, para. 1c.

Recommendation 19

Reject CEG's proposed 'bespoke' indices for price trends as the use of historical data violates the forward-looking requirement of TSLRIC, and because the suggested weightings are not supported by evidence that these reflect an efficient operator.

E7 WACC

- E7.1 Chorus and CEG critique the Commission's proposed WACC. The Commission's Further Draft Determinations reduce the mid-point of the WACC from 6.47% to 6.03%, as a result of changes in input parameters.
- E7.2 We do not agree with CEG's claim that the Commission's cost of equity methodology is inappropriate. Network Strategies have reviewed the material provided by CEG and conclude that "*there is no credible evidence that the Commission's approach is out of step with international regulatory practice*" and moreover, that "*the Commission's approach is entirely consistent with the New Zealand context and should not be amended in the light of short-term considerations.*"⁷⁹
- E7.3 We highlight again Network Strategies' advice that consistency between the assumed asset beta, leverage and credit rating is important, and again urge the Commission to heed the recommendations made in Network Strategies' August report aimed at strengthening the Commission's estimates.⁸⁰

Recommendation 20

Reject CEG's claim that the Commission's cost of equity methodology is inappropriate.

E8 Uplift

- E8.1 Oxera has provided an analysis of whether end-user benefits provided by an uplift to the WACC would exceed the uplift's direct costs.⁸¹ Sapere⁸² and CEG suggest adjustments to Oxera's modelling.
- E8.2 We share Network Strategies' conclusion that:⁸³

Neither Sapere nor CEG address the fundamental flaws of Oxera's analysis that we previously identified⁸⁴, namely:

the absence of evidence of a causal relationship between a WACC uplift and the acceleration of investment in disruptive technologies

a failure to demonstrate that New Zealand service providers are technology laggards

the lack of clarity concerning the next disruptive technology that will have services subject to regulation and is likely to offer benefits on a similar scale as the introduction of high-speed broadband.

⁷⁹ Network Strategies, September 2015 Review of Submissions, section 7.3.

⁸⁰ Network Strategies, August 2015 Report, section 8.

⁸¹ Oxera (2015), *Is a WACC uplift appropriate for UCLL and UBA?*, June 2015.

⁸² Sapere, August 2015 Report, section 5.

⁸³ Network Strategies, September 2015 Review of Submissions, section 8.

⁸⁴ Network Strategies, August 2015 Report, section 9.

- EB.3 Sapere’s report presents against the Oxera analysis and explores the use of a total welfare standard. CEG provides suggested amendments to Oxera’s method, but without supporting evidence.
- EB.4 We support Oxera’s conclusion that results do “not contradict the continued use of a midpoint WACC for UCLL/UBA”⁸⁵ and support the Commission’s decision not to uplift the central TSLRIC estimate, nor the WACC.

Recommendation 21

Retain the current decision not to uplift the central TSLRIC estimate, nor the WACC.

⁸⁵ Oxera (2015), *Is a WACC uplift appropriate for UCLL and UBA?*, June 2015, section 6.