Direct cost attribution in the RAB model

Final report for Commerce Commission, 13 August 2021

Network Strategies Report Number 41012

Contents

1 Introduction

In developing the Initial Asset Value (IAV) model Chorus and its consultants allocated 100% of costs to Fibre Fixed Line Access Services (FFLAS) for certain assets[1], including UFB ducts and manholes, stating that there is no sharing with other services[2].

This short report examines key issues associated with the full direct attribution of these costs to FFLAS, encompassing:

- the allocation of duct assets to UFB FFLAS (Section 2)
- non-FFLAS fibre allocators for selected assets (Section 3)
- a review of practices from overseas jurisdictions (Section 4).

The Annex examines data in the Chorus model, following the identification of discrepancies in Section 3.

Although this report has been prepared for the Commerce Commission (the Commission), the views expressed here are entirely those of Network Strategies.

1 Analysys Mason (2021), *BBM IAV model responses to Attachment B of the Commerce Commission's 26 February 2021 section 221 Notice*, 26 March 2021, section 5.1.5.

2 Chorus (2021), *A12 UFB Assets directly attributable to UFB FFLAS*, 30 June 2021.

2 Allocation of UFB duct assets to Initial Asset Value

2.1 Full allocation

Chorus has deemed that all UFB A-D and UFB E ducts[3] to be 100% allocated to FFLAS for the full duration of their lives[4]. In response to a Commission Request for Information (RFI)[5] Chorus provides reasons for the allocation to FFLAS. The argument presented is on its own reasonably compelling but there are some outstanding questions:

- The discussion only refers to ducts in the context of air blown fibre (ABF). The implication is that all ducts constructed as part of UFB A-D and UFB E decision packets have been equipped with a micro ducting system for ABF making them unsuitable for any other use. In other words, there are no spare ducts. This would normally be considered poor planning and so is unlikely to be true.

- It is reasonable to believe that design and investment rules coupled with declining demand for copper will prevent these duct assets ever being used for copper services.

- However, that does still leave the use of non FFLAS fibre services, either now or in the future. Non FFLAS fibre service volumes are very low, namely [redacted], but of relatively high value. They are limited to the use of interexchange duct assets which will be a small fraction of the total UFB asset[6]. For the IAV the impact might be considered negligible however it is not reasonable to assume that will always be the case.

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3 The IAV model uses "UFB A-D" to refer to assets built for and used by FFLAS and "UFB E" which means they are used only by voluntary FFLAS.

4 Analysys Mason (2021), *BBM IAV model responses to Attachment B of the Commerce Commission's 26 February 2021 section 221 Notice*, 26 March 2021, section 5.1.5.

5 Chorus (2021), *A12 UFB Assets directly attributable to UFB FFLAS*, 30 June 2021.

6 Chorus has not provided any break down of duct assets by network function so this assessment is based on general knowledge of telecommunications practices and network topology. On that basis we would expect interexchange UFB duct assets to be between 5% and 10% of the total UFB duct asset by distance. However, note that an interexchange duct route will typically carry both access and interexchange cables.

Therefore it would be prudent to consider an alternative allocation metric which would be more future-proof.

2.2 Shared allocation

Chorus has deemed other duct assets to be shared and has described the method of calculating an allocator for shared ducts in another RFI response[7]. In simplest terms this is the route length ratio in overlap multiplied by the connections ratio. The two factors are computed for each coverage are type (won, lost, non, national). The factors used are global, not per asset, so these are not fine-grained measures.

There are pre and post implementation algorithms, which are consistent.

- **Pre-implementation:** Overlap fraction (duct route km in overlap area at given date / all duct route km in geography at given date) × connections ratio (FY AOP[8] in-scope FFLAS demand (access lines) in geography / FY AOP all demand (access lines) in geography).

- **Post-implementation:** Weight 1 × fraction of assets overlapping with UFB network + weight 2 × fraction of assets not overlapping with UFB network
  - Weight 1 is the in-scope FFLAS connections ratio
  - Weight 2 takes into account the inclusion of voluntary FFLAS after the implementation date and is consequently zero pre-implementation.

One way to think of this is to view the overlap fraction as that fraction of the duct routes that are available to be used by FFLAS and to pro-rate that fraction of the assets based on the in-scope FFLAS share of the total connections in the geography.

The allocation multipliers that result for these calculations are shown below in Exhibit 1.

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7 Chorus (2021), *A13 Chorus' input data collection for pre-1 December 2011 duct allocator values*, 30 June 2021.

8 Financial Year Average of Period.

Shared with copper duct, national:	[redacted]
Shared with copper duct, won:	[redacted]
Shared with copper duct, lost:	[redacted]
Shared with copper duct, non:	[redacted]

Exhibit 1: *Shared duct asset allocators [Source: Chorus]*

The same allocators are used for all model periods: Pre2012, Post2012 Actual, and Post2012 Forecast.

2.3 Use of pre-2012 allocation methodology as alternative for UFB A-D and UFB E allocations

In seeking an alternative allocation approach in relation to ducts we considered using the methodology proposed by Chorus for pre-1 December 2011 ducts. There are two options:

- If it was applied directly to all UFB A-D and UFB E ducts the ratio would be [redacted] which would undervalue the UFB assets' contribution to the IAV.
- Alternatively, the allocation ratio could be recalculated for the UFB duct assets alone. In that case the overlap ratio is 100%, and the connections ratio is approximately [redacted] in 2021 (note this is a global percentage and not specific to won areas where the number may be higher). Based on these values the allocator would be [redacted] which again undervalues the UFB assets' contribution to the IAV.

In conclusion we do not believe that this is a credible approach without significant modification.

2.4 Other potential approaches

There are two possible alternatives:

- A connections ratio for services that span UFB A-D duct assets could be computed and applied. We expect this to be difficult to compute (probably infeasible) because it requires the ability to map individual service instances to shared network resources.

Initially we would expect that to be very high or even 100%, which is essentially the status quo.

- An approach based on either service volumes or revenues from non FFLAS fibre services. These are the most likely services to share use of UFB assets. However, they would only use the interexchange duct assets which represent a small fraction of the total UFB duct asset. We would expect the value to be between 5% and 10% of the total asset value. Multiplied by the ratio of services this would lead to a very small change in the multiplier, much less than 1%, or multiplied by the ratio of revenues of the order of 1%. This approach is discussed below.

3 Non-FFLAS fibre allocators for selected assets

We believe that there is some sharing with non-FFLAS fibre – which comprises [redacted] of Chorus Regional Transport (CRT) services over the period FY12 to FY20.

We understand that CRT is a high-value interexchange fibre service, that does not utilise the access part of the network, but it would require ducts in the aggregation and core network, which is likely to have some sharing with the distribution network. The disaggregation of assets in the Chorus IAV model is relatively crude – it does not have the level of detail that would distinguish between these different parts of the Chorus network.

In order to allocate the cost of ducts and manholes to non-FFLAS fibre services, we propose applying an assumption for the proportion of those assets that are within the aggregation and core network and shared with other parts of the Chorus network, and then allocate costs based on the proportion of fibre revenue (excluding the capital contribution) that is due to non-FFLAS fibre services (Exhibit 2). The revenue shares are based on actual revenues contained within the Chorus Integrated Demand Revenue Model.

	Non-FFLAS fibre revenue (% of total fibre revenue) (A)	*Allocator lower bound (%)*	*Allocator upper bound (%)*
% of total assets		5.0%	10.0%
FY12	[redacted]		
FY13			
FY14			
FY15			
FY16			
FY17			
FY18			
FY19			
FY20			

Exhibit 2: *Proposed non-FFLAS fibre allocators for UFB ducts and manholes [Source: Chorus, Network Strategies]*

While these allocators are relatively small, given that the asset value of duct in won areas is approximately [redacted], allocating just 1% to non-FFLAS services would translate to [redacted].

Furthermore, we recommend that the regulatory mechanisms must allow for the possibility of other non-FFLAS fibre services being introduced in the future.

It should be noted that although the revenue for non-FFLAS fibre services is non-zero from FY12, the number of non-FFLAS lines remains zero until FY15. A brief discussion of the demand data within the Chorus demand model is included in the Annex.

4 Practices in other jurisdictions

We reviewed wholesale fixed access cost models from other jurisdictions, but found limited data that would assist in the derivation of benchmarks for direct attribution assumptions for the relevant assets in the Chorus model. In this Section we summarise key sharing principles and assumptions applied in Sweden (Section 4.1), and the United Kingdom (Section 4.2).

4.1 Sweden

As part of its wholesale local access market price regulation exercise, the Swedish regulator PTS developed a model of an hybrid copper and fibre network of an Hypothetically Efficient Operator (HEO).[9]

The model assumes that in order to reduce costs an HEO will share or lease infrastructure with other network owners in the form of co-location, including other operators and electricity, water and cable TV networks.

Assumptions on sharing of costs are set for ducts and trenches and chambers/manholes (Exhibit 3) where:

- horizontal is the segment that runs from the access node to the roadside drop-off point
- vertical is the segment that runs from the roadside drop-off point to the customer premise (private domain).

	Urban	*Rural*
Vertical trench and chambers	24%	10%
Horizontal trench and chambers	17%	14%
Duct cost sharing rate	2%	0.26%

***Exhibit 3:** Cost sharing rate [Source: PTS]*

4.2 United Kingdom

Physical Infrastructure Access (PIA) services provide communications providers with access to Openreach's Physical Infrastructure, including ducts, footway boxes, and poles, to enable them to build their own communications networks.

9 Available at https://www.pts.se/sv/bransch/telefoni/konkurrensreglering-smp/prisreglering/kalkylarbete-fasta-natet/gallande-prisreglering/.

As part of the Wholesale Fixed Telecoms Market Review 2021-26[10], Ofcom set out the maximum charges for PIA rental services. Calculations of maximum rental charges are based on a 'cost based' approach which involves the calculation of two components: [11]

- Network adjustment costs – associated with necessary adjustments undertaken by Openreach to make the PIA infrastructure ready for use by other telecoms providers
- Asset costs – these relate to the cost of the existing physical infrastructure to which access is granted.

Ofcom established that 'Network adjustment costs' must be shared across all the services that use these resources:[12]

> …we have decided that the costs of network adjustments should be recovered across all SMP products that use the physical infrastructure subject to a financial limit. We explain that we include an allowance for the costs that Openreach incurs when making network adjustments below that financial limit (appropriately capitalised) in the regulatory cost base that we use to calculate PIA rental charges. Any expenditure above the financial limit is not included in this cost base….
>
> …In this calculation we only estimate the cost of incremental network adjustments incurred below the limit by external, i.e. non-Openreach, telecoms providers. The costs of any network adjustments below the limit incurred by Openreach are included within our forecasts of Openreach's PIA related capital expenditure that we use when assessing asset component costs…

10 Ofcom (2021), *Promoting investment and competition in fibre networks – Wholesale Fixed Telecoms Market Review 2021-26*. Available at https://www.ofcom.org.uk/consultations-and-statements/category-1/2021-26-wholesale-fixed-telecoms-market-review.

11 Ofcom (2021), *Promoting investment and competition in fibre networks: Wholesale Fixed Telecoms Market Review 2021-26, Annexes 1-26*, 18 March 2021. Section A18.1.

12 Ofcom (2021), *Promoting investment and competition in fibre networks: Wholesale Fixed Telecoms Market Review 2021-26, Annexes 1-26*, 18 March 2021. Sections A18.4 and A18.5.

4.3 Concluding remarks

This short review of overseas regulatory practice demonstrates the importance regulators place on developing appropriate sharing assumptions for fixed infrastructure such as ducts and trenches. Obviously local conditions vary considerably from one jurisdiction to the next, and as such so too does the selection of allocation methods and assumptions.

Annex A: Data in the Chorus demand model

Sources for demand in the Chorus demand and revenue model[13] are:

- prior to FY20 – actual data
- FY20 – mix of actual part-year data and expected year-end data
- FY21-FY25 – from Chorus 5YP
- FY26 onwards – Chorus forecast.

FY20

We understand that the FY20 data is an estimate based on actual data for part of the year, and does not align with the demand as stated in the Chorus FY20 financial reports[14] (Exhibit A.1). The demand model overstates total connections for FY20 by just over [redacted].

	FY19	*FY20*
Chorus FY20 report		
Contracted UFB connections	584,000	725,000
Copper connections	840,000	664,000
Fibre connections	610,000	751,000
Total connections	1,450,000	1,415,000
Chorus demand model		
Contracted UFB connections	[redacted]	
Copper connections		
Fibre connections		
Total connections		

***Exhibit A.1**: Comparison of demand in financial reports against demand model [Source: Chorus]*

13 Chorus (2021), *A11.3 Chorus Integrated Demand Revenue Model v4.3ad2*, June 2021.

14 Chorus (2020l, *FY20 Full year result*, presentation, 24 August 2020.

In reviewing Chorus' expenditure proposal for RP1 we note that the HY21 results[15] are considerably lower than Chorus' forecasts for December 2021. Chorus' demand model for the RAB includes forecasts by month, and so we are able to compare its December 2021 forecasts against actuals. This comparison suggests that over the first six months of FY21, demand has been lower than forecast (Exhibit A.2), which is likely to be due to a decline in building activity (discussed below) and potentially also a higher level of fixed-mobile substitution than that anticipated by Chorus, with users opting to switch from copper to mobile or fixed wireless access rather than adopting fibre for broadband services.

	December 2021 forecast	*HY21 result*	*% difference*
Copper connections	[redacted]	556,000	[redacted]
Fibre connections	[redacted]	813,000	[redacted]
Total connections	[redacted]	1,369,000	[redacted]

***Exhibit A.2**: Comparison of December 2021 forecast against actual [Source: Chorus]*

FY21-FY25 and the Chorus 5YP

On review of Chorus' expenditure proposal for RP1, we noted that as the development of the 5YP takes a number of months, the most recent actual Chorus data (rather than 'expected' outcomes or forecasts) to support the proposal was at best no later than February 2020 – more than 14 months prior to our assessment. Input assumptions – for example dwelling consent forecasts – were even older. While we recognise that the regulatory process includes mechanisms to update connections and price indices, there is a risk that other key inputs are now out-of-date.

One key input to Chorus' demand forecasts is MBIE's National Construction Pipeline Report. We understand that the 5YP forecasts are based on MBIE's 2019 report[16]. MBIE

15 Chorus (2021), *HY21 result*, presentation, 22 February 2021.

16 Ministry of Business, Innovation and Employment (2019), *National Construction Pipeline Report 7th edition*, August 2019.

issued its 2020 report[17] in December 2020, which included the anticipated impact on construction due to the COVID-19 pandemic. MBIE states that there will be a significant impact on construction (Exhibit A.3). Chorus demand forecasts were based on a national total of 188,500 dwelling consents over the period 2020 to 2024. The more recent MBIE forecasts expect 135,000 dwelling consents (national) over that same period – a reduction of 28.4% from the 2019 forecasts. MBIE notes a caveat that there is considerable uncertainty associated with its forecasts, as the impact of the pandemic on construction drivers remained unclear.

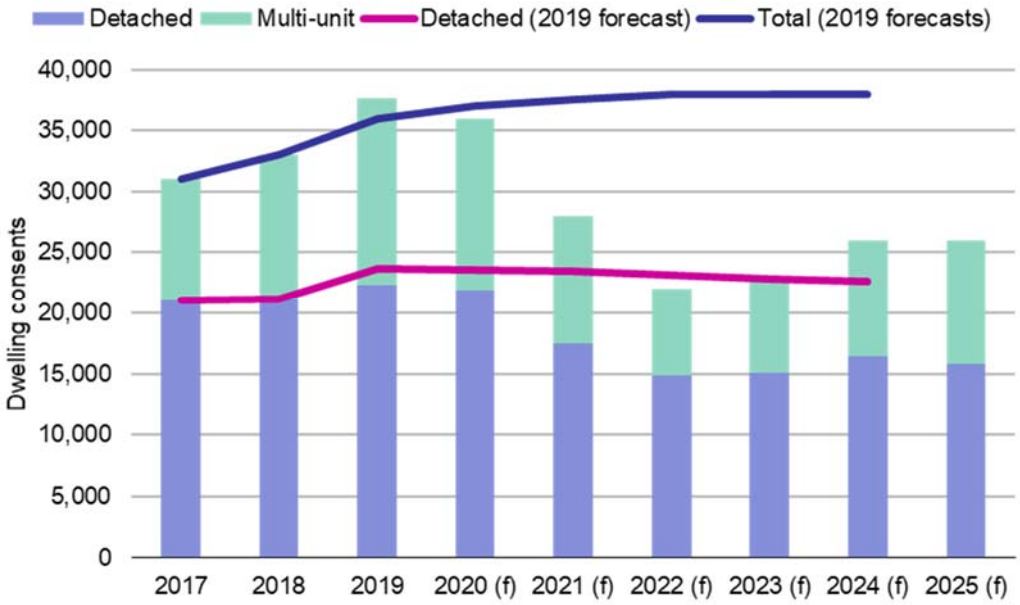

Exhibit A.3: *Dwelling consents: comparison of 2020 forecasts with 2019 forecasts [Source: MBIE, BRANZ/Pacifecon]*

We therefore conclude that the 5YP demand forecasts are likely to be optimistic.

17 Ministry of Business, Innovation and Employment (2020), *National Construction Pipeline Report 8th edition*, December 2020.

Forecasting FY26 and beyond

For years from FY26 onward, demand has been forecast for the various services, for example:

- Chorus broadband – applies the annual growth rates for the period FY23 to FY25
- Chorus voice – applies the annual growth rates for the period FY23 to FY25
- Chorus Corporate Grade – applies the annual growth rates for the period FY23 to FY25
- Chorus legacy PtP – assumed constant at FY25 level.

These forecasts are therefore also likely to be optimistic, given our conclusions regarding the Chorus 5YP.