Telstra Corporation

Amendments to the Fixed Line Services Model

February 2015

Public Version

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1 Introduction

This document sets out amendments and additions Telstra has made to the ACCC Fixed Line Services Model (**FLSM**) to enable the costing of additional services using the model, update the calculation of various parts of the Opex, and update the LSS opex forecast. Some of these changes are in response to questions raised by the ACCC on issues such as the costing of additional services and the adjustment to the Transmission Equipment allocator, while others have been identified as improvements to the model.

The amendments described are made to the version of the model referred to as the FLSM FY2015-19 which was provided to the ACCC on 12 December 2014 (**the Model**). The amended model is referred to as FLSM FY2015 to FY2019 v1.1.

It should be noted that the Model is itself an update to an earlier version of the FLSM (FLSM v1.2). A detailed description of the changes made to that older version of the FLSM to produce the Model are set out in the 'FLSM documentation 121214' provided to the ACCC in December 2014.

Specifically, the following modifications have been made to the Model:

- adjustments to the worksheets 'Opex Forecasts' and '7. Service Costs' to change the treatment of the Telstra Wholesale Business Unit Indirect Operating expenses (addressing the issue identified in Telstra's letter to the ACCC dated 19 January 2015);
- adjustments to the worksheet 'Opex Forecasts' to remove contractor costs associated with installations in response to the ACCC's information request of 14 January 2015 regarding connection and disconnection costs;
- adjustments to the propex forecasts and resulting amounts subtracted from the opex forecasts;
- adjustments to various worksheets to allow for additional services to be included in the costing, in response to the ACCC's information request of 18 December 2014 regarding TEBA costs including those adjustments to the allocation calculation worksheets to include additional services;
- reclassification of some of the NBN capex forecast amounts, in response to the ACCC's information request of 14 January 2015 regarding how NBN capex is allocated;
- adjustments to the calculation of the Transmission Equipment allocator in the worksheet 'Allocations' in response to the ACCC's information request of 14 January 2015 regarding Telstra's investment in transmission equipment;
- update of the LSS opex forecasts in the worksheet 'Opex Forecasts'(as foreshadowed in Telstra's letter to the ACCC dated 19 January 2015); and
- other changes, including correction of some minor errors.

Each of the required modifications is explained in detail in the following sections.

2 Amendments to the treatment of Telstra Wholesale Business Unit Indirect Operating expenses

Operating expenditure for the Telstra Wholesale business unit (**TW BU**) includes cost of sales and management functions for the relevant wholesale services.

As described in the 'Framework and Guide to Forecast Assumptions' accompanying the Telstra Forecast Model, the forecast unit costs per service were determined using TEM Data from FY2011 to FY2014, and the historic demand for those years.[1] These unit costs were then forecast to FY2019 using a three-year rolling average.

In the Model, these wholesale BU operating expenses were distributed across all FLSM Asset Classes, with the resulting allocation of costs attributed to a given Asset Class allocated among wholesale and retail fixed line services (and other services) on the basis of the allocation factors employed for a given Asset Class.

However, these unit costs are specific to each of the fixed line wholesale services. Therefore rather than distributing these costs across all asset classes – where only a fraction of the resulting costs is then allocated to the relevant wholesale services, these costs should be directly added to the annual revenue requirement for the respective wholesale service.

This issue is discussed in detail in Telstra's letter to the ACCC dated 19 January 2015.

The changes required to be made to the Model are set out below.

Changes to 'Opex Forecasts' worksheet

Previously, the TW BU Opex costs were added to the Indirect Opex cost pool and apportioned to the FLSM Asset Classes based on the ratio of Direct Opex costs in each FLSM Asset Class. These costs were then allocated to each of the services based on the allocation factors calculated in the Cost Allocation Framework (**CAF**). This resulted in some of these costs being allocated away from the fixed-line services, and to other services which may also use the assets. This approach, when applied to the TW BU Opex costs would result in costs that are directly attributable to the relevant wholesale fixed line services being (in part) recovered from retail fixed line services and other services. As all of these costs apply only to the relevant wholesale services, the calculations in the worksheet 'Opex Forecasts' were adjusted as follows:

- TW BU Opex costs were removed from the calculation of the sum in the table 'Total Direct and Indirect Operating Expenditure by Asset Classes – raw';
- The table 'Telstra Wholesale Group Indirect Operating Expenditure' was moved to be the last set of calculations in the worksheet;
- The order of the services in this table was changed to match the order in the list 'Services' in the worksheet '3. Masterlists';
- A table containing the calculation of the total TW BU Opex costs per service was added and the table with a row per FLSM Asset Class was removed;
- A table converting the costs per service to FY2009 values was added; and
- The calculation of the Unattributable Indirect Costs was amended to refer to the Total TW BU Opex Cost per year.

Additionally, since the forecast operating expenditure for the Line Sharing Services is based on the RAF accounts, which include the Telstra Wholesale business unit costs, the allowance for Telstra Wholesale business unit costs for LSS has also been removed (see also Section 8 regarding the update of LSS opex forecasts).

[1] Telstra, *Forecast Model v 1.05 – Framework and Guide to Forecast Assumptions*, October 2014, pp 51-53.

Figure 1 sets out the updated calculation of Telstra Wholesale business unit costs:

Figure 1 Updated Calculation of TW BU Opex Costs

The result is a decrease in the costs contained in the table 'Total Direct and Indirect Operating Expenditure by Asset Classes - including indirect' equivalent to the Total TW BU Opex Cost per year. The TW BU Opex Cost is now added separately to the service costs for the relevant wholesale services in the worksheet '7. Service Costs' (see below).

Changes to '7. Service Costs' worksheet

The worksheet '7. Service Costs' contains the calculation of the total cost per service and service prices for each of the relevant wholesale services. The allocations of the total revenue requirement for each service are made in this worksheet and the total cost per service required adjustment to include the TW BU Opex costs per service as follows:

- Table 7.1.4 (TW BU Indirect Operating Costs) was inserted containing the total TW BU Indirect Opex costs per service per year in 2009 dollars (Figure 2);

Figure 2 Table 7.1.4 TW BU Indirect Operating Costs

- Table 7.3.3 (Summary of costs transposed) (Figure 3) was inserted containing the transposed values of Table 7.3.2 (Summary of cost allocation) which previously were contained in Table 7.2.1 (Revenue Requirement Allocated to Services); and

Figure 3 Table 7.3.3 Summary of costs transposed

- Table 7.2.1 (Revenue Requirement Allocated to Services) (Figure 4) has been amended to sum the values in Tables 7.1.4 (TW BU Indirect Operating Costs) and Table 7.3.3 (Summary of costs transposed) to calculate the total cost per service per year.

Figure 4 Revenue Requirement Allocated to Services

3 Amendments made in order to remove contractor costs associated with installations

Contractor costs for connection and disconnection activities form part of the operating expenditure of the CSD line of business within Telstra Operations. These costs include the direct expenditure on the contractor workforce (payments made to external technicians for the performance of connection and disconnection tasks) as well as indirect expenditure, which includes the management costs and overheads of the contractor workforce and management fees paid to the contractor coordinator (ISGM).

In response to the ACCC's information request of 14 January 2015, Telstra identified that contractor costs associated with connection and disconnection activities had been included as part of the base year (FY2014) operating expenditure for CSD within the Forecast Model. The direct and indirect operating expenditure related to contractor activities involving connection and disconnection of services are set out in Figure 5.

Figure 5 Contractor costs for connection and disconnection activities

Given that these costs are recovered through separate charges for the connection and disconnection of fixed line services, there is a risk of over-recovery and the double counting of costs if these remained in the operating expenditure forecasts (where these costs are recovered, in part, through the monthly charges for the relevant wholesale services).

Telstra has therefore amended its forecasts of operating expenditure for the fixed-line services to remove these costs related to connection and disconnection activities. This required the following change to the Model:

Changes to 'Opex Forecasts' worksheet

In order to ensure there was no duplication in the recovery of installation costs due to external contractors, in the table 'Distribution of Activity Type by Asset Class', the costs included in 'Others Spend' for CA02 Copper cables were adjusted to exclude these costs, and the total spend for Indirect opex in cell F308 was adjusted down. Additionally, the ratio of Internal labour to Contractor labour for 'Other activities' was adjusted to remove this cost, resulting in a lower ratio for Contactor labour costs.

Figure 6 CSD Opex Assumptions

4 Amendments made to the propex forecasts

In seeking to address the ACCC's information request of 14 January 2015, Telstra has determined that for the FLSM Asset Classes CA07, CA09, CA10, CO07, CO09 and CO10, historic propex information was inadvertently excluded from the forecast model. As a result of this error, forecast propex was not recorded for these Asset Classes.

Figure 7 shows the resulting total actual and forecast Propex per FLSM Asset Class.

Figure 7 Historic actual and forecast propex by FLSM Asset Class

Note that this table contains values for forecast propex which differ from the table provided in Telstra's 30 January 2015 response to the ACCC's information request of 14 January 2015. This is due to changes in capital expenditure (under the NBN funding group) that have been made to address an error in the attribution of capital expenditure across different asset classes. As detailed in section 6, an adjustment has been made to the NBN related capex, affecting asset classes CA07, CA09, CO07 and CO09, and this has affected the total capex for those asset classes, which in turn has impacted on the propex forecasts. The propex forecasts are calculated using the historic ratio of propex to capex. Any changes to the actual and forecast capex will flow through to the forecast propex.

Including the costs for these asset classes has resulted in a flow-through correction to the Telstra Operations opex forecasts. To ensure no double counting of operating expenditure in the forecast model, Telstra has deducted FY2014 propex for the base year operating expenditure for the relevant lines of business within the Forecast Model.

Of the $XXXm propex shown in the "Opex forecast" worksheet in the FLSM model for FY2014, a total of $XXXm was incurred by the following lines of business within Telstra Operations:

Figure 8 FY2014 propex by Telstra Operations Line of Business

The remainder of the propex ($XXXm) was incurred by groups which do not contribute to the operations and maintenance of the fixed line network (and therefore do not form part of the forecast opex set out in the Forecast Model). These include the Network Delivery and Network Infrastructure Management groups of the Networks line of business and other lines of business of Telstra Operations.

5 Amendments made in order to include additional services

In response to the ACCC's information request of 18 December 2014 regarding TEBA costs, Telstra provided revised versions of the cost allocation framework (**CAF**) and the Forecast Model, with descriptions of the changes required as a result of including IIC and TEBA rack and power services, which are set out below. Additionally, in order to incorporate these services into the FLSM costing, several other worksheets required adjustment in order to facilitate the inclusion of additional services in the cost calculations in the Model. Following are the changes made in order to include cost calculations for TEBA services.

Changes to 'Allocations' worksheet

The revised version of the cost allocation framework provided to the ACCC included new allocation factors for TEBA for those asset classes used by TEBA services – i.e. asset classes CO07 (Other Communications Plant and Equipment), CO08 (Network Land), CO09 (Network Buildings / Support) and CO10 (Indirect Capital Assets).

For the CO07, CO08 and CO09 asset classes, the share of costs previously allocated to Third Party Access has now been split between TEBA and Other Third Party Access (referred to as 'Other TPA'). Previously, this allocation of costs for these asset classes between Fixed Line Services and Third Party Access had been based on the number of racks. In order to identify usage by the TEBA service, the Third Party Access share has been split into TEBA and Other TPA, again based on the number of racks (row 862 of the 'Allocations' worksheet).

For asset class CO10, the allocation to TEBA services was based on the general allocator applied to that asset class.

The following amendments were made to the worksheet 'Allocations':

- the table of Third Party Access proportions used to allocate Asset Classes CO07, CO08 and CO09 between Fixed Lines Services, TEBA and Other TPA was amended (Figure 9) (row 862).

Figure 9 Ratios used for allocation of CO07 Other Comms Plant, CO08 Network Land and CO09 Network Buildings/Support costs

- three columns were inserted into the tables of allocators per asset class per year to allow the calculations of new allocations, formulae in the column for TEBA services were inserted referring to the updated ratios in Figure 9, formulae in the Total column were adjusted to include the new columns and the calculations for Other Fixed Line Services and Other Services were amended to take into account these columns (Figure 10); and

Figure 10 Allocation Factors - FY2015

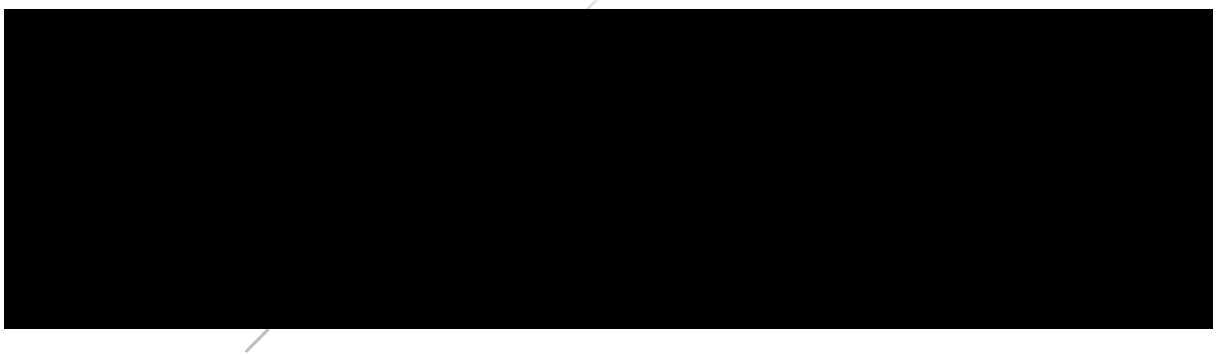
- three columns for extra services were inserted into the General Allocations tables and formulae referring to the new allocations in the tables per asset class per year were added to the TEBA column (Figure 11).

Figure 11 Calculation of General Allocations – FY2015

Changes to 'Allocation Summary' worksheet

Three columns for extra services were inserted in the tables summarising the allocations per asset class per year and formulae were inserted to reference the additional allocations in Allocations (Figure 12**Error! Reference source not found.**).

Figure 12 Summary of Allocation Factors - FY2015



Changes to 'Opex Forecasts' worksheet

As noted in Section 2, the calculation of TW BU Indirect Opex has been amended. Additionally, as can be seen in Figure 1, these tables have been amended to include the new services.

Refinement of power cost attribution method

In order to be able to attribute the appropriate costs to TEBA services, the calculation of power, rent and outgoings costs in the worksheet 'Opex Forecasts' required modification.

As noted in Telstra's letter to the ACCC dated 19 January 2015, in augmenting the Cost Allocation Framework to cover TEBA services, Telstra has identified certain refinements to improve the attribution of network power costs to Asset Classes that are the driver of these costs. Improving this attribution ensures an appropriate allocation of these costs between TEBA and other services that make use of the relevant Asset Classes.

In the Forecast Model provided to the ACCC in October 2014, all network power costs were attributed to the Network Buildings and Support asset class (CO09). This implied that the driver of the network power costs were the network buildings themselves, rather than the network equipment (e.g. the equipment that makes up the relevant FLSM Asset Classes and other assets). As a consequence, network power costs were allocated among services that made use of the fixed-line network – including TEBA users – in accordance with the general allocator used for the CO09 asset class.

In reviewing the allocation of costs for TEBA services, Telstra has identified that certain power costs are directly attributable to TEBA power, while other power costs are directly attributable to specific asset classes, including asset classes not used by TEBA services. Specifically, it has been identified that:

- around XX% of total power consumption by network equipment is attributable to TEBA power usage;
- around XX% of total power consumption by network equipment is attributable to other third party access;
- around XX% of total power consumption by network equipment is attributable to FLSM asset classes which are not used by TEBA services, including the 'Switching Equipment – Local', 'Switching Equipment – Trunk', 'Data Equipment' and 'Transmission Equipment' asset classes; and
- XX% of total power consumption by network equipment is attributable to the Network Buildings and Support asset class.

Given this, it is not appropriate for all network power costs to be attributed to the Network Buildings and Support asset class and allocated to services using the general allocator. Rather, power costs should be attributed to the asset class (or, in the case of non-Telstra use, TEBA and third-party network users) that causes these costs to be incurred.

Therefore Telstra has updated the Model to refine the method for attribution of network power costs. Rather than all power costs being attributed to the Network Buildings and Support asset class, these costs are now allocated between Third Party Access – TEBA, Third Party Access – Other, and the FLSM asset classes. It should be noted that the power costs that are attributed to these three service groups are not Telstra's total power costs but only that proportion of the costs attributable to either the FLSM asset classes or third party usage. Power costs attributable to non-FLSM asset classes (e.g. mobile network infrastructure) are excluded.

This update to the attribution of power costs has involved the following amendments to the Opex Forecasts worksheet:

- the table titled 'Power consumption by FLSM telco equipment (kWh)' has been amended to modify the classification of some equipment and add two new equipment types associated with supply of third party access services. The two new equipment types are 'Third Party Access – TEBA' and 'Third Party Access – Other' (Figure 13);
- all equipment types in this table are now associated with an FLSM asset class, with the exception of the two new equipment types associated with supply of third party access services (Figure 13);
- the split of power consumption between CAN and Core (rows 353 and 354) has been updated to reflect relative power usage between CAN and Core asset classes (based on the refined attribution methodology) (Figure 13);

Figure 13 Networks Opex Assumptions

- a table splitting the electricity expenses by asset class has been inserted (row 480) and the values added to the sums in the table containing the total Networks Indirect and Direct Operating Expenditure by Asset Classes (Figure 14); and

Figure 14 Electricity costs per Asset Class

- formulae in the table titled 'Networks Indirect and Direct Operating Expenditure by Asset Classes' (row 377) have been amended to look up this new table.

Update to forecast power and network building costs to include third party usage share

In the Forecast Model provided to the ACCC in October 2014, forecast network power costs, rent and building outgoings had excluded costs attributable to third party use of network buildings.

Given that a portion of these costs are to be allocated to third party use of network buildings (including use by TEBA services), the forecasts of these building-related costs need to be updated to include those costs attributable to third party use.

Telstra has therefore made the following updates to the Forecast Model:

- total power consumption by equipment in kWh (cell F356) (see Figure 13) and the total power cost for FY2014 (cell F439) has been updated to include power costs attributable to all third party access usage;

- a table calculating power usage for all third party usage has been inserted (Figure 15) (row 459); and

Figure 15 Calculations third party usage of electricity

- the amounts for rent (row 497) and building outgoings (rows 500 and 501) for FY2014 have been updated to include the share of these costs attributable to third party usage of network buildings.

Under the attribution and allocation rules applied in the Forecast Model and Cost Allocation Framework, the portion of these costs attributable to third party use of the network will be allocated away from fixed line services – i.e. fixed line services will not bear any portion of network power or building costs attributable to third party access. For power costs this will be realised through the refined attribution methodology referred to above, whereby power costs attributable to third party usage will not be assigned to any FLSM asset class (rather these costs will be attributed to either Third Party Access – TEBA or Third Party Access – Other). For rent and building outgoings, this will be realised through the allocator for the CO09 asset class which provides for a proportionate allocation of these costs to third party usage.

Other Worksheets

The inclusion of additional services in the Model necessitates changes to worksheets other than those which are part of the Forecast Model or the CAF in order that the calculations correctly take account of the additional information.

Changes to 'C. Masterlists' worksheet

- Three rows were added to Table C.3 and populated with labels and descriptions for the new services (Figure 16**Error! Reference source not found.**); and

- the named range 'Services' was expanded to include the additional rows in Table C.3.

Figure 16 Table C.3 Services

Changes to '5. Service Demand' worksheet

- An additional three rows were added to Table 5.1 for new services and the cells in these new rows were linked to the demand forecasts worksheet (Figure 17).

Figure 17 Table 5.1 Annual Service Demand

Changes to '7. Service Costs' worksheet

- An additional three rows were added to Table 7.1.2 for new services and linked to the demand forecasts worksheet (Figure 18);

Figure 18 Table 7.1.2 Annual Demand for each Service

- An additional three rows were added to Table 7.1.4 for new services (see Figure 2);
- Table 7.1.5 was inserted containing the power (electricity) costs allocated to TEBA services (Figure 19);

Figure 19 Table 7.1.5 TEBA Power Costs

- An additional three rows were added to Table 7.2.1 for new services and formulae calculating costs per service were adjusted (Figure 20);

Figure 20 Table 7.2.1 Revenue Requirement Allocated to Services

- An additional three rows were added to Table 7.2.2 for new services and formulae calculating costs per service were added (Figure 21);

Figure 21 Table 7.2.2 Service Prices

- An additional three rows were added to Table 7.2.3 for new services and formulae calculating costs per service were added (Figure 22);

Figure 22 Table 7.2.3 Service Prices (Adjusted for Inflation)

- an additional three columns were inserted in Tables 7.3.1 (Figure 23) and 7.3.2 (Figure 24**Error! Reference source not found.**) for new services and formulae were added calculating costs per service;

Figure 23 Table 7.3.1 Allocation of Revenue Requirement to Each Service – FY2015

Figure 24 Table 7.3.2 - Summary of cost allocation

- three columns were added to the allocations table to the right of Table 7.3.1 for new services and formulae adjusted to refer to correct ranges (Figure 25);and

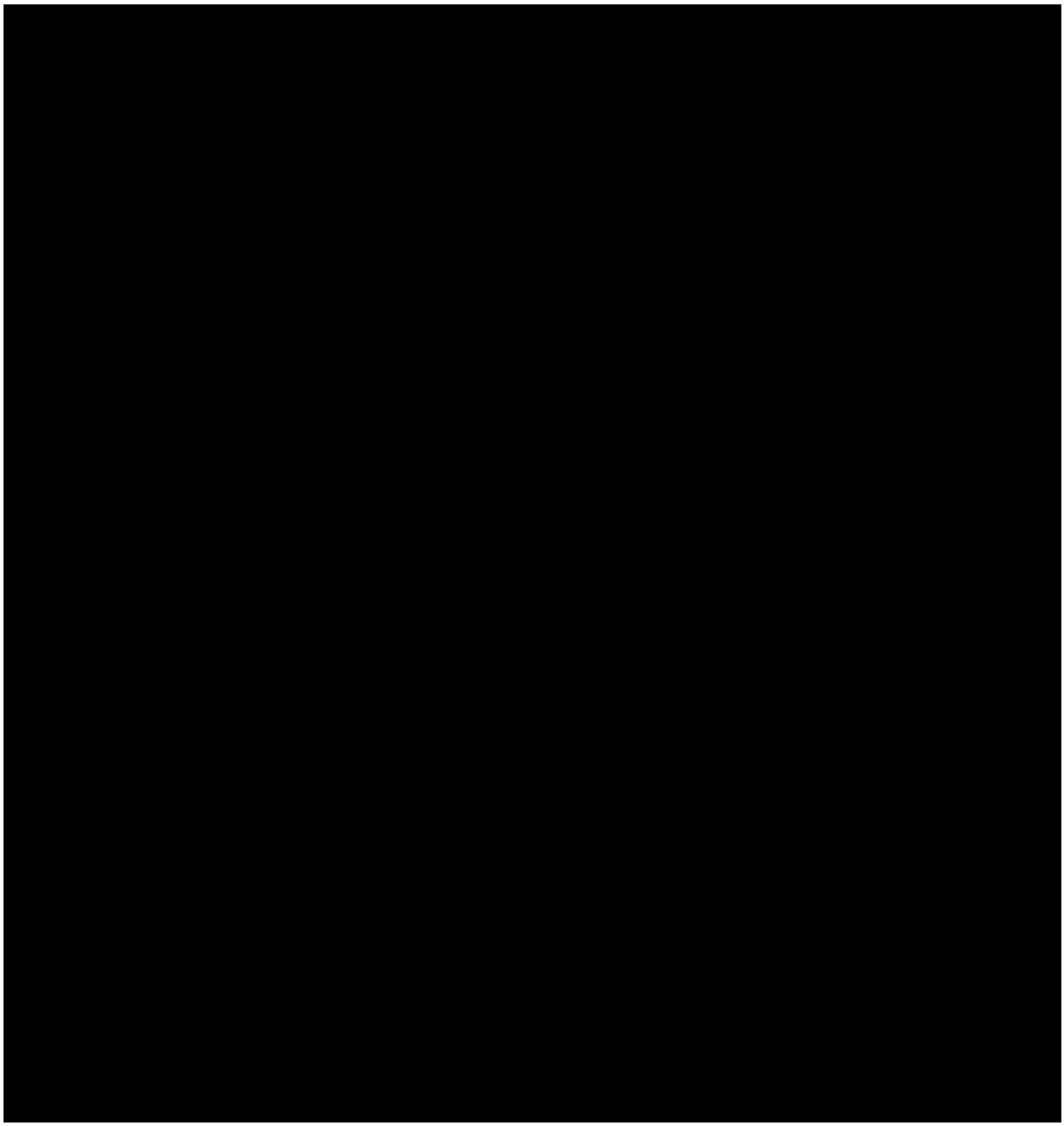
Figure 25 Allocations table - FY2015

- an additional three columns were inserted in Table 7.3.3 for new services (see Figure 3 in Section 2 above);

Changes to 'G. Revenue Disaggregate' worksheet

- additional rows were inserted in Table G.2.1 for new services and formulae added which refer to the new rows in tables G.4.8, G.4.9 and G.4.10 (described below) (Figure 26);

Figure 26 Table G.2.1 Revenue Requirement Allocated to Services

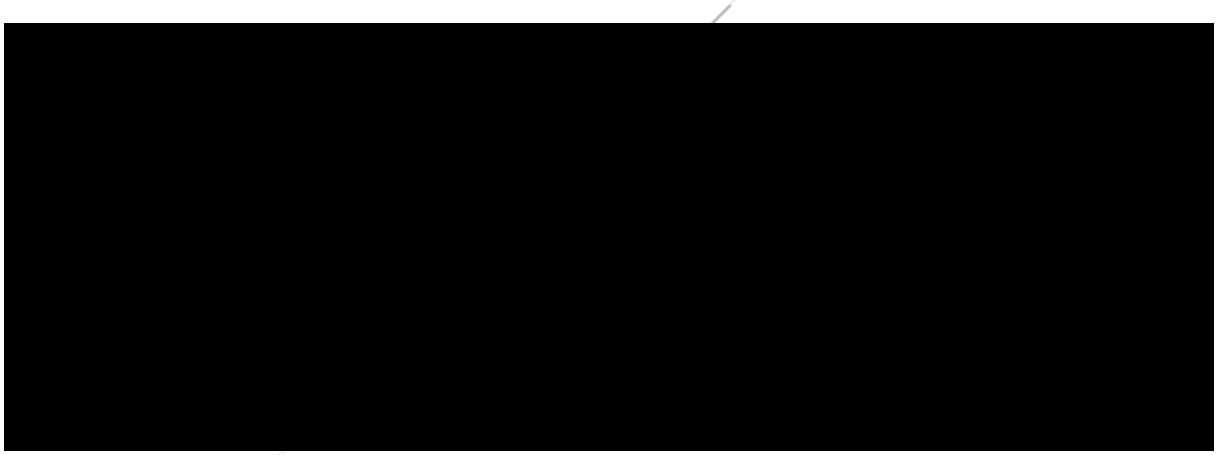


- tables G.3.8, G.3.9 and G.3.10 were inserted for new services with formulae referring to the correct cells in worksheet 'Allocation Summary' (Figure 27); and

Figure 27 Table G.3.8 Revenue Requirement Allocations - S08 TEBA

- tables G.4.8, G.4.9 and G.4.10 were inserted for new services with formulae referring to the correct cells (Figure 28);

Figure 28 Table G.4.8 Detailed Revenue Requirement - S08 TEBA



Changes to 'Price Summary' worksheet

Most tables in the worksheet 'Price Summary' have had additional rows inserted for the new services. For example, the table containing the results of the calculation of prices under Scenario A – Uniform prices over the Regulatory Period) (Figure 29);

Figure 29 Scenario A Price output table

Changes to 'NBN Scenario Selection' worksheet

The output tables in this worksheet have all had additional rows inserted for the new services showing the resulting prices for each option (Figure 30). Note that the % change in pricing does not apply for S08 TEBA as there are no previous regulated prices for comparison.

Figure 30 Scenario Output tables

6 Amendments to reclassify some NBN capital expenses

In response to the ACCC's information request of 14 January 2015, Telstra has determined that certain historic NBN related capex was incorrectly allocated to CAN asset classes in the Forecast Model. Specifically, capex expenditure for the asset classes Other Communication Plant and Equipment, Network Land and Network Buildings/Support can be classified as either CAN or Core Assets. Our investigations showed that all NBN capex for these specified asset classes should been allocated against the Core rather than the CAN. Figure 31 shows the updated NBN capex table in the worksheet 'Capex Forecasts'.

Figure 31 Direct and Indirect Capital Expenditure by Asset Classes - NBN calculations

7 Amendments to the Transmission Equipment allocator

In response to the ACCC's information request of 14 January 2015, Telstra has been able to further refine the CO05 Transmission Equipment allocator to capture the diversity of equipment types which make up the asset class. Specifically, the Transmission Equipment allocator now includes synchronous digital hierarchy (**SDH**), wavelength division multiplexing (**xWDM**), plesiochronous digital hierarchy (**PDH**) and Other Platform allocations.

Previously, the CAF disaggregated the transmission equipment asset class into PDH, SDH and other network equipment for the purposes of determining cost allocations. This was based on asset category information (two-alpha code) within Telstra's asset register. Within this categorization the 'SD' asset category class included both SDH and xWDM equipment. Under this approach, xWDM equipment was implicitly assumed to have the same usage allocation to services as SDH equipment.

Telstra has used more granular information from the asset register to separate xWDM equipment from SDH equipment within the SD asset category. This allows the application of the separate cost allocator with respect to xWDM equipment.

The calculation of the Transmission Equipment allocators in the FLSM FY2015-FY2019 v1.1 follows the same methodology as set out in the 'Framework and Model Guide' accompanying the CAF, with the addition of the extra transmission equipment type (xWDM) and calculations employing the latest available data i.e. as at June 2014.

Previously (as set out in the Model) and based on the written down value recorded in Telstra's Asset Register as at June 2013, almost XX% of the value of assets within the Transmission Equipment Asset Class were SDH assets (which included xWDM equipment), with less than XX% PDH assets and other assets (equipment huts, synching clocks and network software) accounting for around XX% of the total asset value. These values were updated using Telstra's Asset Register as at June 2014:

Figure 32 Makeup of CO05 Transmission Equipment asset value by equipment type

Type of Transmission Equipment	% of 2014 Written Down Value (WDV)
SD Category (SDH & xWDM)	
PD Category (PDH)	
OTHER	

In order to forecast the separate SDH and xWDM equipment proportions, additional data within the asset register was used to split the SD category into SDH and xWDM, based on the written down value of the relevant equipment types as at June each year 2012 to 2014.

Figure 33 SD Transmission Equipment WDV and proportion of CO05 Transmission Equipment

	$m 2012	$m 2013	$m 2014	% 2012	% 2013	% 2014
SDH						
xWDM						
Total SD						
Total CO05						

The platform allocation split between SDH and xWDM equipment was forecast to FY2019 using the running three-year average of the proportion of the total CO05 Transmission Equipment WDV.

Figure 34 Platform Allocation

	SDH/xWDM previous CAF	SDH	xWDM	PDH	OTHER
FY2014					
FY2015					
FY2016					
FY2017					
FY2018					
FY2019					

The service platforms that utilise the Transmission Equipment Asset Class – i.e. those platforms that make use of Telstra's SDH, xWDM and PDH transmission assets – include fixed line voice services, fixed line broadband services as well as other services, including mobile services, shared and specialist data services and leased line services.

Changes have been made to the platform allocators to ensure that the allocation of costs with respect to xWDM equipment reflects the best available information on the use of this equipment.

As for PDH and SDH allocators used in the Model, calculations for xWDM were performed using data extracted from Telstra's NDSD containing the proportion of xWDM links recorded against the type of equipment they are connected to (for example PSTN switches, mobile base stations, DSLAMs). The type of system was mapped against the list of product platforms and categories using those systems, and usage per product was summarised. These products were then categorised as DSL (including Retail and Wholesale DSL); PSTN (including Retail, Fixed Interconnect and LCS); or Other (Figure 35).

Figure 35 Distribution of links - xWDM Transmission

	DSL	PSTN	Other
FY2014			
FY2015			
FY2016			
FY2017			
FY2018			
FY2019			

Allocation of costs between Fixed Line Services and other services

In order to calculate cost allocators for the relevant regulated fixed line wholesale services with respect to CO05, an initial allocation is made to the set of fixed line voice services and fixed line broadband services – with remaining costs allocated to other services – and individual allocators for fixed line services then calculated as a share of the initial allocation.

The allocation logic for CO05 can be expressed as follows for a given year:

$$\begin{aligned}\text{CO05} = \propto (&Fixed\ Voice_{SDH} + ADSL_{SDH} + Other_{SDH}) + \beta(Fixed\ Voice_{xWDM} + ADSL_{xWDM} + Other_{xWDM}) \\ &+ \gamma(Fixed\ Voice_{PDH} + ADSL_{PDH} + Other_{PDH}) \\ &+ (1- \\ &\propto -\beta - \gamma)\left(\frac{\propto Fixed\ Voice_{SDH} + \beta Fixed\ Voice_{xWDM} + \gamma Fixed\ Voice_{PDH}}{\propto +\beta + \gamma}\right. \\ &\left.+ \frac{\propto ADSL_{SDH} + \beta ADSL_{xWDM} + \gamma ADSL_{PDH}}{\propto +\beta + \gamma} + \frac{\propto Other_{SDH} + \beta Other_{xWDM} + \gamma Other_{PDH}}{\propto +\beta + \gamma}\right) \\ &= 1\end{aligned}$$

Where

- $\propto$ is the proportion of the CO05 Asset Class comprising SDH transmission equipment.
- β is the proportion of the CO05 Asset Class comprising xWDM transmission equipment.
- γ is the proportion of the CO05 Asset Class comprising PDH transmission equipment.
- Then, for SDH (the equivalent expressions hold for xWDM and PDH)
    - $Fixed\ Voice_{SDH} = Fixed\ Voice_{SDH} \times \left(\sum_{Service=k}^{K} \frac{Service\ Demand_k}{Service\ Demand_K}\right)$, with $Fixed\ Voice_{SDH}$ the proportion of CO05 SDH equipment cost allocated to the fixed line voice services, and $Service\ Demand_k$ is forecast demand for a given fixed line voice service *k* multiplied by the Routing Factor for *k* with respect to CO05.
    - $ADSL_{SDH} = ADSL_{SDH} \times \left(\sum_{Service=j}^{J} \frac{Service\ Demand_j}{Service\ Demand_J}\right)$, with $ADSL_{SDH}$ the proportion of CO05 SDH equipment cost allocated to the fixed line broadband services, and $Service\ Demand_j$ is forecast demand for a given fixed line broadband service *j* multiplied by the Routing Factor for *j* with respect to CO05.
    - $Other_{SDH}$ is the proportion costs with respect to CO05 SDH equipment allocated to services other than the fixed line voice and ADSL services.
- Note, allocations to services with respect to non-SDH, xWDM or PDH equipment (the proportion of SO05 given by $(1-\propto -\beta - \gamma)$) are determined for fixed voice, ADSL and other services as the weighted average of the individual service allocation with respect to SDH, xWDM and PDH equipment.

The process for determining the initial allocation of costs to the set of relevant Fixed Line Services and other services is set out in more detail in the 'Framework and Model Guide' accompanying the CAF.

Allocation of costs to individual fixed line services

In order to generate cost allocators in respect of CO05 Transmission Equipment for the individual Fixed Line Services (and, in particular, the regulated fixed line wholesale services), the proportion of costs allocated to DSL and PSTN service types for the SDH, xWDM and PDH transmission platforms are further allocated on the basis of forecast demand for the relevant services.

For fixed line broadband services, the share of CO05 Transmission Equipment cost allocated to the DSL platform is further disaggregated to retail and wholesale ADSL services on the basis of forecast SIOs. Other DSL services – business grade, specialist DSL services that make use of SHDSL technology – are not included in this allocation. Costs with respect to these services are included in the Other category as these services are classified as non-DSL data for the purposes of the NDSD/NECTAR allocation process.

For fixed line voice services, allocation of costs is based on forecast minutes of use SIOs, weighted by routing factors reflecting the different intensities of usage for different voice services in respect of transmission equipment.

Details of the engineering assumptions and methods used to calculate routing factors for the fixed line voice services in respect of CO05 are set out in the 'Framework and Model Guide'. The routing factors set out in the Framework and Model Guide still apply.

Once service-specific allocators are calculated for SDH, xWDM and PDH equipment, the weighted average of these allocators are then used to allocate the remaining equipment value in the Asset Class. The calculated allocations to PSTN OA/TA, LCS and WDSL for costs related to CO05 Transmission Equipment are set out in the following table.

Figure 36 Calculated allocations of cost for CO05 Transmission Equipment to regulated fixed line wholesale services – PSTN OA/TA, LCS and WDSL

	PSTN OA/TA	LCS	WDSL
FY2014			
FY2015			
FY2016			
FY2017			
FY2018			
FY2019			

8 Amendments to the forecast LSS Operating expenses

Operating expenditure for the Line Sharing Service is forecast using the historical costs allocated in the RAF. The previous forecasts were based on data up to and including the RAF reported as at December 2013. As the RAF report for June 2014 became available on 28 October 2014, the forecasts were updated using this data and the same methodology. Figure 37 shows the updated LSS Operating Expenditure forecasts.

Figure 37 Line Sharing Service Operating Expenditure forecasts

Additionally, as the RAF accounts include Telstra Wholesale business unit costs, the allowance for Telstra Wholesale business unit costs for LSS has been removed (see above Figure 1).

9 Additional corrections

Additional corrections were made for errors discovered while updating the Model:

Changes to Opex Forecasts worksheet

The ratio used to forecast the BU Support Indirect Operating Expenditure was updated when the formula used to calculate the ratio was amended (row 17). Previously, this was calculated as the ratio of the indirect opex to the total direct and indirect opex, however, this is not the correct method to calculate a mark-up ratio. The calculation was amended to be the ratio of the indirect opex to direct opex.

While reconciling to the GL small discrepancies were found which required adjustments to the split of operating expenditure costs between ITS categories (rows 577-580), the split of operating expenditure costs between TSO business groups (rows 670-696) and the ratios for Management Markup, Logistics Markup and Training Markup for both ITS and TSO lines of business (rows 545-547 and 651-653). The impact of these changes on the total Opex Forecasts were negligible.