IT'S HOW WE CONNECT

Telstra Corporation

Updating the Fixed Line Services Model

Amendments to allow for determination of new FAD prices

December 2014

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1 Introduction

This document explains the amendments and additions Telstra has made to the ACCC Fixed Line Services Model (**FLSM**) to facilitate the determination of updated prices for each of the declared fixed line services for the period to 30 June 2019.

The version of the FLSM most recently used by the ACCC is version 1.2 (used to determine WADSL prices in the 2013 FAD and referred to in this document as the FLSM FY2012-14). Modifications are now required to be made to the FLSM FY2012-14 to facilitate the estimation of service prices beyond the current FAD period (FY2012-14), to accommodate a new cost allocation framework and expenditure forecasts (with flow through impacts to the calculation of prices and the service types used within the model) and to correct identified errors in the model – including the calculation of the RAB and depreciation impact of asset disposals.

Specifically, the following modifications are required:

- addition of four new worksheets at the front of the model showing the model design, NBN rollout scenario assumption (which can be changed by the user) and output summary;
- adjustments to several worksheets to facilitate roll forward of the RAB and estimation of the revenue requirement for FY2015-19 (i.e. extension of the model to cover the new regulatory period);
- addition of two new worksheets and consequential modifications to existing worksheets, to incorporate a fully allocated cost framework, as proposed by Telstra;
- changes to existing worksheets to ensure the model correctly addresses asset disposals;
- addition of new worksheets, and consequential modifications to existing worksheets, to incorporate forecasts of expenditure and demand for FY2015-19; and
- other changes, including changes to the economic parameters worksheet to accommodate different WACC and inflation estimates for different periods.

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

2 Addition of Model Design, NBN scenario and output summary worksheets

As the layout of the model has been amended, a new worksheet 'Model Design' has been added to the front of the model, to replace the existing worksheet 'A. Model Design'. A new cover sheet has also been included to replace the original, noting that changes have been made based on the FLSM FY2012-14 which was used to determine WDSL pricing. The new model is referred to as the FLSM FY2015-19 throughout this document.

Additionally, three new worksheets have been added immediately after the worksheet 'Model Design' showing the NBN rollout scenario assumptions (which can be changed by the user) and output summaries. The purpose of these new worksheets is to allow the user to vary NBN rollout assumptions, and to readily observe the impact on price calculations of varying these assumptions.

Each of these new worksheets is explained below.

2.1 New Cover worksheet

The 'Cover Page' worksheet has been added to the front of the model to reflect that changes have been made to the version of the model which the ACCC used to produce prices for WDSL services.

2.2 New Model Design worksheet

The 'Model Design' worksheet has been added to the model (immediately after the cover worksheet), to reflect the revised layout of the model. This new worksheet contains the flow diagram set out in Figure 1 below.

As can be seen from Figure 1, the model design has been updated to incorporate new worksheets including the new forecast worksheets, allocation worksheets and NBN scenario worksheets. The model design has also been simplified in a number of areas.

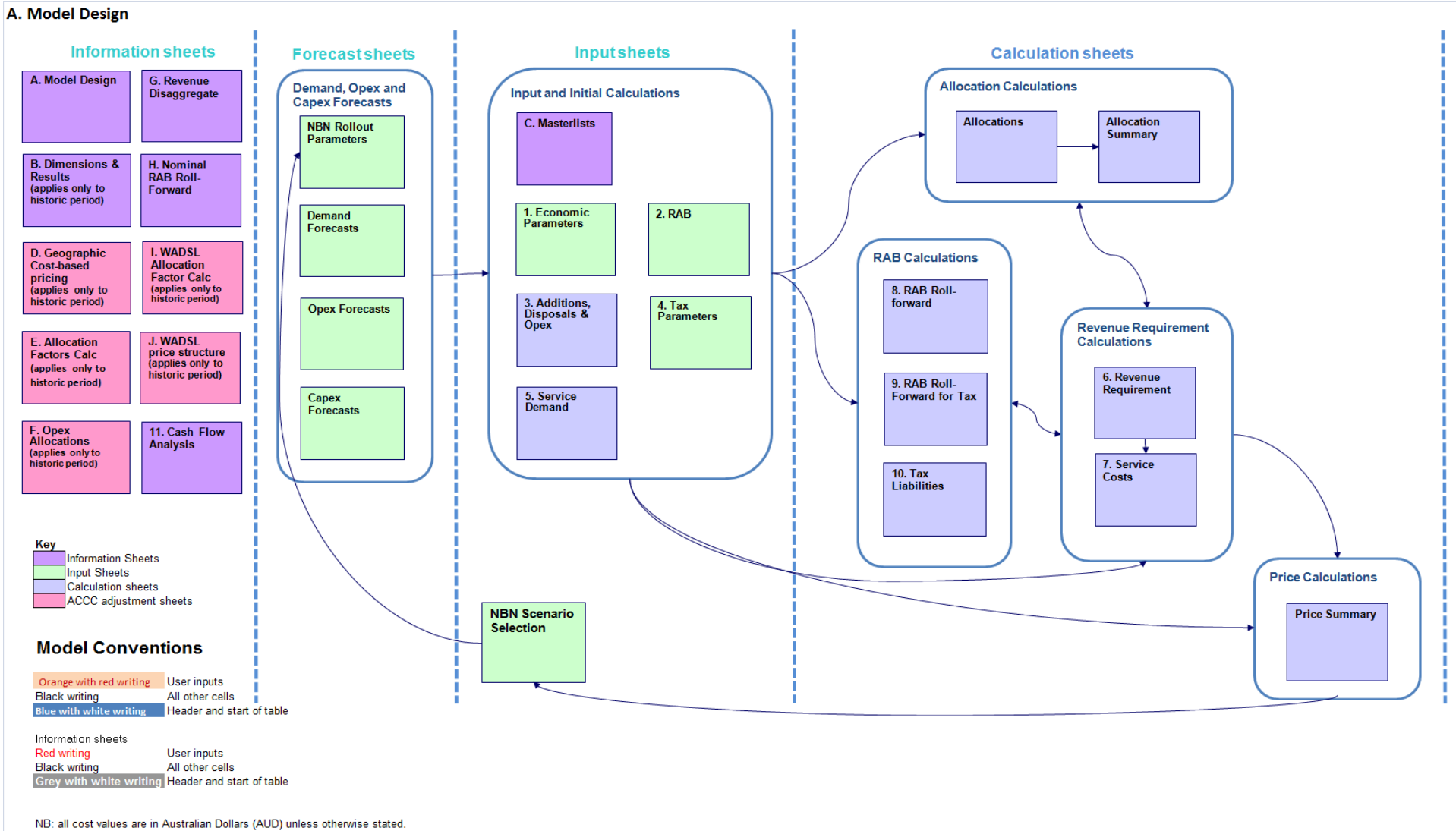
The key changes to the model layout (which will be explained further below) are:

- addition of a new set of forecast worksheets, showing forecasts of expenditure and demand for FY2015-19 and the NBN rollout parameters upon which these forecasts are premised;
- addition of new NBN scenario selection and price summary worksheets. As noted above, the purpose of these new worksheets is to allow the user to vary NBN rollout assumptions and to readily observe the impact on price calculations of varying these assumptions;
- addition of new allocation worksheets to give effect to Telstra's proposed fully allocated cost approach;
- simplification of the interactions between the calculation worksheets, by grouping these according to their core function. Calculation worksheets are grouped as either RAB, revenue requirement, allocation or price calculation worksheets; and
- repositioning of worksheets not required to calculate prices for FY2015-19. As will be explained below (section 3.2) a number of worksheets from the FLSM FY2012-14 are no longer required to calculate prices for FY2015-19. These worksheets have been retained, but have been moved away from the operational input and calculation worksheets, to the back of the worksheet list. These worksheets are now listed as 'Information worksheets' in the model design flowchart.

The model design flowchart also shows the conventions used throughout the model. These conventions are intended to allow the user to readily distinguish between input values and calculated values, and between different worksheet groups. Header rows and tables are highlighted in blue with white text, user input cells are highlighted in orange with red text, while all other cells are white and contain black text.

The flow diagram has been updated to group the worksheets by their function. Forecast sheets contain demand, operating expense, capital expense and NBN rollout forecasts for the period FY2015-19. The Input sheets contain all other variables which are user-input or calculated using the Forecast values. The Calculation sheets contain the calculation of the allocation factors, the rollover of the RAB, the revenue requirement and the resulting prices. Lastly, the Information sheets are those not required for calculating prices for FY2015-19, and have been repositioned to the back of the worksheet list.

Figure 1: Model Design Flow Diagram –FLSM FY2015-19



2.3 'NBN Scenario Selection' worksheet

The 'NBN Scenario Selection' worksheet has been added immediately after the 'Model Design' worksheet.

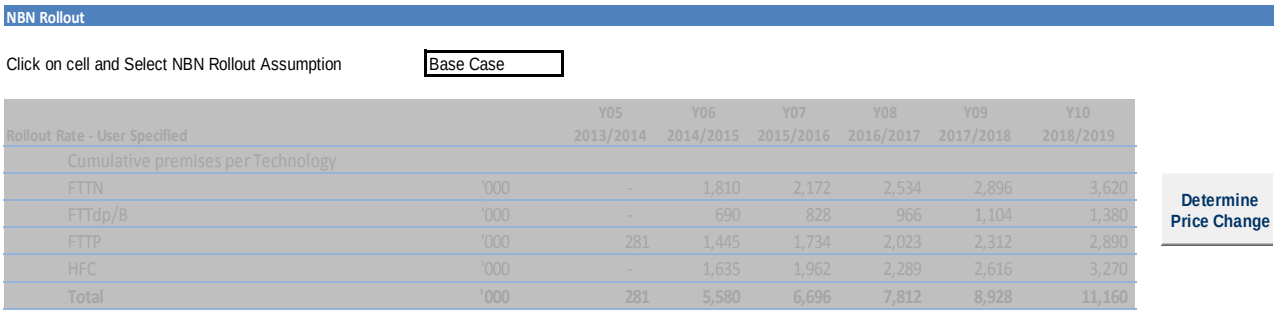
The purpose of this new worksheet is to allow the user to choose the NBN rollout scenario to be applied throughout the FLSM FY2015-19. This worksheet also includes a button for updating prices when the NBN rollout scenario is changed, so that the effect of changing the scenario on service prices can be immediately observed.

The 'NBN Scenario Selection' worksheet includes a dropdown box which allows the user to select the NBN rollout assumption (cell D10). Currently, there are two options available – 'Base Case' or 'User Specified'. If 'Base Case' is selected, all NBN rollout assumptions in the FLSM FY2015-19 will reflect the NBN Rollout Base Case Scenario (as referred to in Telstra's submission on primary prices[1]), which is based on the rollout rate and technology mix assumptions set out in the NBN Co Strategic Review[2]. If 'User Specified' is selected, then the user may manually enter a different set of rollout rate and technology mix assumptions in the table immediately below the dropdown box (cells F12 to J19), and all NBN rollout assumptions in the FLSM FY2015-19 will reflect these manually entered assumptions.

If the NBN scenario is changed, prices must be re-calculated to reflect the revised rollout assumptions. This is facilitated by the 'Determine Price Change' button which appears to the right of the rollout rate table, which runs an Excel macro to re-calculate prices based on the selected NBN rollout scenario. This button must be clicked every time the NBN rollout scenario is changed.

The scenario selection part of the worksheet is shown in Figure 2 below, with the 'Base Case' option selected. As 'Base Case' is selected, the rollout rate table is greyed out. However if 'User Specified' were to be selected, this table would appear for editing by the user.

Figure 2: NBN scenario selection



Next there are a series of tables showing calculated prices in the chosen NBN rollout scenario, under three different price adjustment scenarios. The three price adjustment scenarios shown are those referred to in Telstra's submission on primary prices:[3]

- Scenario A - the adjustment to service prices that is required to allow Telstra a reasonable opportunity to recover the revenue requirement, while maintaining existing price relativities and adjusting prices only once (i.e. applying an equal adjustment to all service prices in FY2016);
- Scenario B - the adjustment to prices that results from simply updating FLSM FY2015-19 cost inputs and allocation rules, without any adjustment to maintain existing price relativities; and
- Scenario C - a 'glide path' adjustment across all service prices.

[1] Telstra, *Public inquiry into final access determinations for fixed line services—primary prices: Response to Discussion Paper*, 3 October 2014, p 10.
[2] NBN, http://www.nbnco.com.au/content/dam/nbnco/documents/NBN-Co-Strategic-Review-Report.pdf
[3] Telstra, *Public inquiry into final access determinations for fixed line services—primary prices: Response to Discussion Paper*, 3 October 2014, section 20.

Each of the price adjustment scenarios would allow Telstra a reasonable opportunity to recover the revenue requirement – this can be confirmed by comparing the total revenue requirement (cell E23) with the revenue expected to be generated under each price adjustment (cells J40, J58 and J76). However, as discussed in Telstra's submission on primary prices, the options potentially have different implications for the long-term interests of end-users.[4]

For each price adjustment scenario, prices are updated each time the NBN scenario is changed and the 'Determine Price Change' button is clicked. The updated prices in each table link to the 'Price Summary' worksheet (discussed below), which is where the primary price calculations occur.

Figure 3 below shows the price output tables, with the 'Base Case' NBN rollout scenario selected. It can be observed that under each price adjustment scenario the total revenue expected to be generated is equal to the total revenue requirement. However the way in which prices are adjusted to allow for recovery of this revenue requirement has a significant impact on pricing for individual services.

Figure 3: Price output tables

A. Total Revenue Required from 7. Service Costs Adjusted for Inflation $M	[redacted]

A. Prices for FY15-FY19 Solved for Revenue Requirement		7.6% change from current prices						
Fixed Line Access Services			Prices					Revenue	
Code	Service		2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	Generated $M	Change
S01	Unconditioned Local Loop Service Band 1 - 3	$ / month	16.21	17.44	17.44	17.44	17.44	[redacted]	7.6%
S02	Unconditioned Local Loop Service Band 4	$ / month	48.19	51.84	51.84	51.84	51.84		7.6%
S03	Wholesale Line Rental	$ / month	22.84	24.57	24.57	24.57	24.57		7.6%
S04	PSTN Originating & Terminating Access	c / minute	0.95	1.02	1.02	1.02	1.02		7.6%
S05	Local Carriage Service	c / call	8.90	9.57	9.57	9.57	9.57		7.6%
S06	Line Sharing Service	$ / month	1.80	1.94	1.94	1.94	1.94		7.6%
S07	Wholesale ADSL	$ / month							
	WADSL Zone 1 port	$ / month	24.44	26.29	26.29	26.29	26.29		7.6%
	WADSL Zone 2/3 port	$ / month	29.66	31.91	31.91	31.91	31.91		7.6%
	AGVC/VLAN	$ / Mbps / month	32.31	34.76	34.76	34.76	34.76		7.6%
	Total								

B. Prices for FY15-FY19 Solved for Revenue Requirement remaining									
Fixed Line Access Services			Prices					Revenue	
Code	Service		2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	Generated $M	Change
S01	Unconditioned Local Loop Service Band 1 - 3	$ / month	16.21	18.43	18.43	18.43	18.43	[redacted]	13.7%
S02	Unconditioned Local Loop Service Band 4	$ / month	48.19	38.74	38.74	38.74	38.74		-19.6%
S03	Wholesale Line Rental	$ / month	22.84	25.35	25.35	25.35	25.35		11.0%
S04	PSTN Originating & Terminating Access	c / minute	0.95	1.01	1.01	1.01	1.01		6.8%
S05	Local Carriage Service	c / call	8.90	3.76	3.76	3.76	3.76		-57.8%
S06	Line Sharing Service	$ / month	1.80	5.51	5.51	5.51	5.51		206.1%
S07	Wholesale ADSL	$ / month							
	WADSL Zone 1 port	$ / month	24.44	27.99	27.99	27.99	27.99		14.5%
	WADSL Zone 2/3 port	$ / month	29.66	34.18	34.18	34.18	34.18		15.3%
	AGVC/VLAN	$ / Mbps / month	32.31	18.91	18.91	18.91	18.91		-41.5%
	Total								

C. Glide Path for Prices for FY15-FY19 Solved for Revenue Requirement remaining									
Fixed Line Access Services			Prices					Revenue	
Code	Service		2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	Generated $M	Change
S01	Unconditioned Local Loop Service Band 1 - 3	$ / month	16.21	16.77	17.33	17.89	18.45	[redacted]	13.8%
S02	Unconditioned Local Loop Service Band 4	$ / month	48.19	49.86	51.52	53.19	54.85		13.8%
S03	Wholesale Line Rental	$ / month	22.84	23.63	24.42	25.21	26.00		13.8%
S04	PSTN Originating & Terminating Access	c / minute	0.95	0.98	1.02	1.05	1.08		13.8%
S05	Local Carriage Service	c / call	8.90	9.21	9.52	9.82	10.13		13.8%
S06	Line Sharing Service	$ / month	1.80	1.86	1.92	1.99	2.05		13.8%
S07	Wholesale ADSL	$ / month							
	WADSL Zone 1 port	$ / month	24.44	25.28	26.13	26.97	27.82		13.8%
	WADSL Zone 2/3 port	$ / month	29.66	30.68	31.71	32.73	33.76		13.8%
	AGVC/VLAN	$ / Mbps / month	32.31	33.43	34.54	35.66	36.78		13.8%
	Total								

[4] Telstra, *Public inquiry into final access determinations for fixed line services—primary prices: Response to Discussion Paper*, 3 October 2014, section 20.

2.4 NBN rollout parameters worksheet

The 'NBN Rollout Parameters' worksheet shows the detailed NBN parameters and assumptions that will be applied throughout the FLSM FY2015-19, including in each of the forecast worksheets. These parameters will update each time the NBN rollout scenario is changed in the 'NBN Scenario Selection' worksheet.

Under the Selected Rollout Scenario is the 'Rollout Rate' table, which summarises the cumulative number of premises assumed to be passed by NBN Co in each year, by technology. The formulae in this table link to the scenario selection made in the 'NBN Scenario Selection' worksheet, as follows:

- where the user has selected 'Base Case' in the 'NBN Scenario Selection' worksheet, the rollout rate will reflect the NBN Rollout Base Case assumptions. This information is sourced from the NBN Co Strategic Review and is found in the Base Case tables in cells N10 to U33; and
- where the user has selected 'User Specified' in the 'NBN Scenario Selection' worksheet, the rollout rate will reflect the manually entered rollout assumptions in the table 'Rollout Rate' that worksheet.

The rollout rate is shown both in terms of the cumulative *number* of premises passed in each year and as a cumulative *percentage* of premises passed in each year, for each technology and in total (see Figure 4 below).

Figure 4: NBN rollout rate assumptions

Rollout Rate			Y05 2013/2014	Y06 2014/2015	Y07 2015/2016	Y08 2016/2017	Y09 2017/2018	Y10 2018/2019
	Proportion of period							
Cumulative premises per Technology	FTTN	'000	-	220	440	934	1,701	2,469
	FTTdp/B	'000	-	-	-	173	518	863
	FTTP	'000	281	590	1,064	1,525	1,915	2,305
	HFC	'000	-	1,044	2,088	2,693	2,858	3,023
	Total	**'000**	**281**	**1,854**	**3,592**	**5,324**	**6,991**	**8,659**
Cumulative % premises per Technology	FTTN		0%	6%	12%	26%	47%	68%
	FTTdp/B		0%	0%	0%	13%	38%	63%
	FTTP		10%	20%	37%	53%	66%	80%
	HFC		0%	32%	64%	82%	87%	92%
	Overall %		**3%**	**17%**	**32%**	**48%**	**63%**	**78%**
	% FTTP, FTTdp/B		**7%**	**14%**	**25%**	**40%**	**57%**	**74%**
	% FTTN		**0%**	**6%**	**12%**	**26%**	**47%**	**68%**

Below the rollout rate assumptions are calculations of the cumulative number of brownfields premises migrated in each year, by technology and in total. These migration rate calculations are a function of the rollout rate assumptions (referred to above) and the rate at which customers are assumed to migrate to the NBN once their area is passed. As explained in Telstra's submission on primary prices, it is assumed that:[5]

- 55% of customers will migrate within 12 months of being passed; and
- 100% of customers will migrate within 24 months.

Consistent with these assumptions, the cumulative number of brownfields premises migrated in each year, by technology and in total, is calculated as follows:

$$Migrated_t = 100\% \times Passed_{t-2} + 55\% \times (Passed_{t-1} - Passed_{t-2})$$

where:

Migrated$_i$ is the cumulative number of premises migrated in year *i*; and

[5] Telstra, *Public inquiry into final access determinations for fixed line services—primary prices: Response to Discussion Paper*, 3 October 2014, p 10.

$Passed_i$ is the cumulative number of premises passed in year *i*

Also calculated in this worksheet (row 38) is the percentage of copper cable assets transferred to NBN Co in each year as a result of FTTN rollout. This is calculated as the incremental number of premises passed by FTTN in each year, multiplied by the average number of copper SIOs per premises (to account for potentially multiple services at each premises), divided by total CAN SIOs.

2.5 Price Summary worksheet

The 'Price Summary' worksheet contains the calculation of service price adjustments required to provide for recovery of the calculated revenue requirement. These calculations are dependent on the NBN rollout scenario selected. This scenario choice influences the forecast revenue requirement and forecast service demand. The output from this worksheet is also presented in the worksheet 'NBN Scenario Selection'.

The purpose of this worksheet is twofold:

- To clearly set out the calculated price points for each year, as well as the weighted average prices for either a five year or four year price setting period, and to show the relationship between the calculated prices and the estimated revenue requirement. This allows for confirmation that, when multiplied by the forecast demand volumes, the calculated prices generate revenue equal to the revenue requirement for the regulatory period.

- To enable the user to enter an alternative set of service prices and to compare the resulting revenue generated with the revenue requirement. This will allow the user to enter alternative price points, for example to smooth price changes across services, or to rebalance price structures for different services, and compare the results to the revenue requirement.

This worksheet sources data from, the worksheets '1. Economic Parameters' (Table 1.3 Inflation Rates), '5. Service Demand' (Table 5.1 Annual Demand for each Service) and '7. Service Costs' (Table 7.2.1 Revenue Requirement Allocated to Services, Table 7.2.2 Service Prices, and Table 7.3.1 Allocation of Revenue Requirement to Each Service).

Price calculations are provided for the three different price adjustment scenarios referred to in Section 2.3 and in Telstra's submission on primary prices.

2.5.1 Scenario A calculations

The first two tables in the 'Price Summary' worksheet (reproduced in Figure 5 below) provide for calculation of the required price adjustment where prices are adjusted only once (in FY2016) and uniformly across each of the declared fixed line services. This is achieved through an Excel macro which solves for the uniform price adjustment required to ensure that revenue expected to be generated from all of the declared fixed line services for FY2015-19 (cell G22) is equal to the total revenue requirement for those years (cell E22). The resulting uniform price adjustment is shown in cell G25.

Figure 5: Scenario A calculations - the uniform one-off price adjustment

Scenario A.						
Code	Service		Total Revenue Requirement $M	Prices $	Revenue Generated $M	Check
S01	Unconditioned Local Loop Service Band 1 - 3		[redacted]	17.44	[redacted]	
S02	Unconditioned Local Loop Service Band 4			51.84		
S03	Wholesale Line Rental			24.57		
S04	PSTN Originating & Terminating Access			1.02		
S05	Local Carriage Service			9.57		
S06	Line Sharing Service			1.94		
S07	Wholesale ADSL					
	WADSL Zone 1 port			26.29		
	WADSL Zone 2/3 port			31.91		
	AGVC/VLAN			34.76		
	Total					

Fixed Line Access Services Prices				Average overall price change	7.6%
Code	Service	Units	Current price	Alternative price	
S01	Unconditioned Local Loop Service Band 1 - 3	$ / month	16.21	17.44	
S02	Unconditioned Local Loop Service Band 4	$ / month	48.19	51.84	
S03	Wholesale Line Rental	$ / month	22.84	24.57	
S04	PSTN Originating & Terminating Access	c / minute	0.95	1.02	
S05	Local Carriage Service	c / call	8.90	9.57	
S06	Line Sharing Service	$ / month	1.80	1.94	
S07	Wholesale ADSL				
	WADSL Zone 1 port	$ / month	24.44	26.29	
	WADSL Zone 2/3 port	$ / month	29.66	31.91	
	AGVC/VLAN	$ / Mbps / month	32.31	34.76	

The revenue expected to be generated for service *i* over the period FY2015-19 is calculated as a function of forecast demand for that service and the calculated service price in each year, as follows:

$$Revenue\ Generated_i = Price_{i,FY2015} \times Demand_{i,FY2015} + Price_{i,FY2016-19} \times Demand_{i,FY2016-19}$$

The demand forecasts driving this calculation are set out in rows 61 to 75 of the Price Summary worksheet, which link to the Service Demand worksheet. These are the same demand forecasts used elsewhere in the FLSM FY2015-19.

The total revenue requirement for each service over the period FY2015-19 is calculated in rows 92 to 104 of the Price Summary worksheet, as the sum of the annual revenue requirements for each year. The annual revenue requirements link to the worksheet '7. Service Costs', where the revenue requirements are calculated.

2.5.2 Scenario B calculations

This scenario assumes prices are adjusted once (in FY2016) however existing price relativities are not maintained, and is set out in rows 139 to 152 of the 'Price Summary' worksheet (reproduced in Figure 6 below).

Figure 6: Scenario B calculations - one off non-uniform price adjustment

Scenario B.

Code	Service	FY15 Prices	Revenue Generated $M	Revenue Remainder $M	Prices $	Revenue Generated $M	Check
S01	Unconditioned Local Loop Service Band 1 - 3	16.21	[redacted]		18.43	[redacted]	
S02	Unconditioned Local Loop Service Band 4	48.19			38.74		
S03	Wholesale Line Rental	22.84			25.35		
S04	PSTN FOAS & FTAS	0.95			1.01		
S05	Local Carriage Service	8.90			3.76		
S06	Line Sharing Service	1.80			5.51		
S07	Wholesale ADSL				39.82		
	WADSL Zone 1 port	24.44			27.99		
	WADSL Zone 2/3 port	29.66			34.18		
	AGVC/VLAN	32.31			18.91		
	Total						

The price for each service type for FY2016-19 is calculated as the remaining revenue requirement for that service type for FY2016-19 (after subtracting the revenue expected to be generated in FY2015, based on current prices) divided by total forecast service demand for the years FY2016-19. This calculation is as follows:

$$Price_{FY2016-19} = \frac{Revenue\ Requirement_{i,FY2015-19} - Revenue\ Generated_{i,FY2015}}{Demand_{i,FY2016-19}}$$

where:

$$Revenue\ Generated_{i,FY2015} = Price_{i,FY2015} \times Demand_{i,FY2015}$$

For Wholesale ADSL, port and AGVC price adjustments are calculated in rows 157 to 174. These adjustments are calculated so as to provide for recovery of the total revenue requirement for the Wholesale ADSL service, while maintaining existing relativities between port and AGVC charges and as between geographic areas.

2.5.3 Scenario C calculations

This scenario assumes a glide path adjustment and is set out in rows 109 to 137 of the 'Price Summary' worksheet (reproduced in Figure 7 below).

The first step in the glide path calculation is to determine the amount by which prices must be adjusted across FY2016-19 (assuming a uniform annual adjustment for all services in each of the four years) so that total revenue expected to be generated from all services for FY2015-19 is equal to the total revenue requirement for those years. This is achieved through an Excel macro which solves for the total price adjustment required to ensure that total revenue expected to be generated (cell J137) is equal to the total revenue requirement (cell E22). The resulting total price adjustment across the four years is shown in cell I113, and this is used to calculate price adjustments for FY16, FY17 and FY18 (cells F113 to H113).

Figure 7: Scenario C calculations – glide path adjustment

Scenario C.

	Glide Path Results	Prices				
Code	Service	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
	% change from 2014/15 prices	0.0%	3.5%	6.9%	10.4%	13.8%
S01	Unconditioned Local Loop Service Band 1 - 3	16.21	16.77	17.33	17.89	18.45
S02	Unconditioned Local Loop Service Band 4	48.19	49.86	51.52	53.19	54.85
S03	Wholesale Line Rental	22.84	23.63	24.42	25.21	26.00
S04	PSTN FOAS & FTAS	0.95	0.98	1.02	1.05	1.08
S05	Local Carriage Service	8.90	9.21	9.52	9.82	10.13
S06	Line Sharing Service	1.80	1.86	1.92	1.99	2.05
S07	Wholesale ADSL					
	WADSL Zone 1 port	24.44	25.28	26.13	26.97	27.82
	WADSL Zone 2/3 port	29.66	30.68	31.71	32.73	33.76
	AGVC/VLAN	32.31	33.43	34.54	35.66	36.78

Fixed Line Access Services			Revenue Generated $						
Code	Service	$M	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	Total	Check
S01	Unconditioned Local Loop Service Band 1 - 3								
S02	Unconditioned Local Loop Service Band 4								
S03	Wholesale Line Rental								
S04	PSTN FOAS & FTAS								
S05	Local Carriage Service								
S06	Line Sharing Service								
S07	Wholesale ADSL								
	WADSL Zone 1 port								
	WADSL Zone 2/3 port								
	AGVC/VLAN								
	Total								

2.5.4 Calculation of de-averaged prices for FOAS and FTAS[6]

The FLSM FY2012-14 referred to this service by its original name – PSTN Originating and Terminating Access. This terminology has been updated in the FLSM FY2015-19

The calculation of de-averaged FOAS and FTAS prices is set out in rows 179 to 230 of the 'Price Summary' worksheet. This calculation is only undertaken for Scenario A.

De-averaged FOAS and FTAS prices are calculated for CBD, metropolitan, provincial and rural areas based on relative usage between geographic areas, and the share of service costs attributable to each area. For each geographic area *i*, the de-averaged price is calculated as:

$$Price_i = Price_{national} \times \frac{Cost\ share_i}{Usage\ share_i}$$

This formula calculates the price for each geographic area based on the cost attributable to that geographic area, divided by usage in that area. However, so that this calculation can be linked to adjustments to the nationally averaged price (and so it can update whenever the nationally averaged price is updated), it relies on cost and usage shares, relative to national cost and usage.

Usage shares (shown in row 184) are calculated based on actual usage in FY2014. As relative usage (between geographic areas) is not expected to change materially over time, these usage shares can be applied to calculate prices for all future years out to FY2019.

Cost shares (shown in row 225) are calculated by allocating FOAS and FTAS costs between geographic areas in the following manner:

- Costs for the local switching equipment asset class (CO01) are first allocated between port dependent and traffic dependent components, and then between geographic areas. The allocation between port dependent and traffic dependent components is as per the cost allocation framework[7], and the shares calculated for each of these components link to the cost allocation worksheets within the FLSM FY2015-19. Port dependent costs are allocated

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[7] Telstra, *Cost Allocation Framework for the ACCC Fixed Line Services Model: Framework and Model Guide*, Version 1, July 2014, section 5.2.1.

between geographic areas based on the number of POTS SIOs in each area as at the end of December 2013, as reported in the CAN RKR. Traffic dependent costs are allocated between geographic areas based on actual usage data for FY2014.

- Costs for the inter-exchange cables asset class (CO04) are allocated based on straight-line distances between local exchanges and PoIs in each geographic area.
- Costs for the transmission equipment asset class (CO05) are allocated based on the amount of equipment in each geographic area, and relative usage between areas.
- Costs for the network buildings / support asset class (CO09) use the same geographic cost allocator as local switching equipment.
- Costs for each of remaining asset classes are allocated based on the average of the cost shares across the main asset classes referred to above (CO01, CO04, CO05 and CO09).

The overall cost share for each geographic area (row 225) is calculated as a weighted average of the cost shares calculated for that area for each individual asset class.

The calculation of de-averaged FOAS / FTAS prices, based on the calculated cost and usage shares by geographic area, is shown in Figure 8 below.

Figure 8: Calculation of de-averaged FOAS / FTAS prices

			CBD	Metro	Provincial	Rural
S04	PSTN FOAS & FTAS	c / minute	0.74	0.84	1.01	2.43

3 Amendments to cover the new regulatory period

3.1 Updating the model calculation period

Several adjustments are required to calculation periods to enable the FLSM FY2015-19 to calculate revenue requirements and price terms for FY2015-19.

These adjustments are listed below for each affected worksheet.

C. Masterlists

As discussed below, certain model dimensions have been moved from the original worksheet ('B. Dimensions & Results') to the 'C. Masterlists' worksheet. This includes the model calculation period dimension, which now appears in rows 10 to 13 of the 'C. Masterlists' worksheet.

In the FLSM FY2012-14, the model calculation period was set to 5 years. In the FLSM FY2015-19 this needed to be changed to 10 years, in order to extend calculations up to and including FY2019. This is shown in Figure 9 below.

Figure 9: Model calculation period update

Additionally, all tables and named ranges relating to the depreciation method to be used in the model have been deleted as they are not required[8],.

G. Revenue Disaggregate

The 'G. Revenue Disaggregate' worksheet contains a number of formulae for calculation of cost building blocks and the total revenue requirements which have been extended out to FY2019.

The following tables have had formulae extended:

- Table G.2.1 (Revenue Requirement Allocated to Services) – formulae in column L have been extended to columns M, N, O, P and Q;
- Tables G.3.1 to G.3.6 (Detailed Revenue Requirement Calculations – Allocation Factors) – formulae in column L have been extended to columns M, N, O, P and Q; and
- Tables G.3.7 to G.3.12 have been re-labelled as tables G.4.1 to G.4.6 under a new heading 'G.4 Detailed Revenue Requirement Calculations' – formulae in column L have been extended to columns M, N, O, P and Q.

As explained below (section 4.2), in tables G.3.1 to G.3.6, formulae for FY2015 onwards have also been amended so that they look up the new 'Allocation Summary' worksheet (rather than the old 'E. Allocation Factors Calc' worksheet). Additionally, new tables have been inserted in sections G.3 and G.4 to account for revisions to the service list.

[8] Variables relating to the depreciation method weren't required in the FLSM FY12-14 - the straight-line method was used throughout the model.

3.2 Moving of worksheets not required for calculation of prices for FY2015-19

A number of worksheets in the model are no longer required for calculation of prices for FY2015-19. This is due to the way in which some calculations have been updated and amended for FY2015-19, including reflecting the revised allocation framework and revised approach to forecasting expenditure and demand (discussed below).

Where worksheets are not required to calculate prices for FY2015-19, they have been retained so that all calculations for the FY2012-14 period can still be seen. However these worksheets have been moved to the end of the worksheet list and tabs greyed out.

The worksheets not required for FY2015-19 calculations are:

- the original model design worksheet (referred to as 'A. Model Design') which has been replaced by an updated model design worksheet (refer to section 2.1 above);
- the original dimensions and results worksheet ('B. Dimensions & Results'), which shows certain model dimensions and price outputs. For the FY2015-19 period, price outputs are shown in the new NBN scenario and output summary worksheets (refer to section 2 above) and model dimensions (calculation period, depreciation method and asset classes) are shown in the worksheet 'C. Masterlists'.
- the 'D. Geo Cost-based pricing' worksheet contains the original ULLS and WLR geographic deaveraging calculations for the FY2012-14 period. Beyond FY2014, these de-averaging calculations are no longer required, because ULLS is split into two separate services (i.e. Band 1-3 and Band 4) for the purposes of pricing. Minor adjustments were required to ensure that the correct demand figures were referred to in the formulas for the previous period;
- the 'E. Allocation Factors Calc' worksheet contains the original allocation calculations for the FY2012-14 period. Beyond FY2014, revised and updated allocation calculations are set out in separate worksheets, as explained in section 4 below. Minor adjustments were required to ensure that the correct demand and service cost figures were referred to in the formulas for the previous period;
- the 'F. Opex allocations' worksheet was used to allocate total operating expenditure to asset classes for the period to FY2014. This is not required beyond FY2014, because Telstra has developed a bottom-up forecasting methodology which provides for forecasts in each relevant asset class;
- the 'H Nominal RAB Roll-Forward' worksheet is not required for pricing beyond FY2014, because the RAB roll-forward calculations take place in the '8. RAB Roll-Forward' worksheet;
- the 'I. WADSL Allocation Factor Calc' worksheet contains the original allocation calculations for the Wholesale ADSL service for the FY2012-14 period. Beyond FY2014, revised and updated allocation calculations are set out in separate worksheets, as explained in section 4 below. Minor adjustments were required to ensure that the correct demand and service cost figures were referred to in the formulas for the previous period;
- the 'J. WADSL price structure' worksheet contains the original price structure calculations for the Wholesale ADSL service for the FY2012-14 period. Beyond FY2014, it is proposed that the existing price structure and relativities between tariff components be maintained, and therefore these calculations are not required; and
- the '11. Cash Flow Analysis' worksheet is no longer required, as cashflow analysis is provided in the new Price Summary worksheet.

As noted above, these worksheets have been retained for information purposes, but have been moved to the end of the worksheet list and tabs greyed out.

4 Updating the allocation framework

As discussed in detail in previous submissions to the ACCC, Telstra has developed a fully allocated cost framework, for use in the FLSM FY2015-19.[9] Telstra has previously submitted its cost allocation framework (**CAF**) model and documentation to the ACCC.[10]

The purpose of the CAF is to work as part of the FLSM FY2015-19 to determine the revenue requirement for the set of regulated fixed line wholesale services. The calculation of cost allocators is a critical component of estimating prices for declared services supplied over the fixed line network. Annual costs are calculated using the FLSM FY2015-19 and cost allocators are used to apportion annual costs for the relevant Asset Classes to services for which those costs are to be recovered.

In developing the CAF and integrating it into the FLSM FY2015-19, Telstra has focused on the practical application of the Fixed Principles, adopted and re-used existing modelling frameworks (where feasible) and ensured a consistent approach with the similar BBM-based access pricing regimes used by the ACCC, the AER and other Australian regulators.

In broad terms, the CAF operates as follows:

- The calculations of the individual cost allocation factors are undertaken in the new worksheet 'Allocations'. For each Asset Class, either a Specific Allocator or a General Allocator is calculated. [define specific and general]

- For the Asset Classes for which a Specific Allocator is calculated, inputs from the worksheet '5. Service Demand' and the Routing Factors table are used by each of the Specific Allocator calculations (in conjunction with other data specific to certain Asset Classes) to determine cost allocators for the regulated fixed line wholesale services.

- For the Asset Classes for which a General Allocator is calculated, the CAF Model applies the weighted average allocator for a particular service across the Asset Class group (i.e. the CAN Asset Classes or the Core Asset Classes) to a particular Asset Class. For a given service, the results of the calculated specific allocators (for the group of CAN Asset Classes or Core Asset Classes) are multiplied by the Revenue Requirement for each matching CAN or Core Asset Class allocators. This is taken from the worksheet '7. Service Costs'. The results for each service are then divided by the aggregate revenue requirement for the CAN or Core Asset Classes to determine the General Allocator.

- The results of the individual Asset Class specific and general allocators are then tabulated by year for each service (at the top of the worksheet 'Allocations'). These annual tabulations include a 'check' function that tests that, for each year, the sum of allocations for a given Asset Class equals one.

- The relevant allocators are then linked to the worksheet 'Allocation Summary'.

- The Routing Factors table within the worksheet 'Allocations' is used to determine which fixed line voice and broadband services are allocated costs for each Asset Class. For fixed line access services as well as for fixed line broadband services the routing factor for a given Asset Class will be set at either '1' or '0' (indicated as '-'). Where the routing factors are applied to fixed line voice services, the calculated routing factor may be '1', '0' or some other positive number. Routing factors for the fixed line voice services will vary depending on the estimated relative load the particular service places on an Asset Class.

For a more detailed explanation please refer to the CAF documentation previously provided.[11]

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[9] Telstra, *Public inquiry into final access determinations for fixed line services—primary prices: Response to Discussion Paper*, 3 October 2014, Part E.

[10] Telstra, *Cost Allocation Framework for the ACCC Fixed Line Services Model: Framework and Model Guide* (Version 1), July 2014 (provided to the ACCC on 4 July 2014).

Integration of the CAF into the FLSM FY2015-19 required two new worksheets to be added and consequential changes to some existing worksheets. These modifications are explained below.

4.1 Additional worksheets

Two additional worksheets have been added to the model to accommodate the proposed fully allocated cost model:

- 'Allocation Summary' is a summary of the allocators in tabular format to enable easy reference from other parts of the model; and
- 'Allocations' contains the workings of the CAF, showing how each allocator is calculated, and providing a checksum to ensure that all costs are fully allocated.

The operation of these two worksheets is explained in detail in the CAF documentation previously provided to the ACCC.[12]

These two worksheets have been inserted between existing worksheets 'C. Masterlists' and 'G. Revenue Disaggregate'.

4.2 Consequential changes to existing worksheets

The CAF produces allocators for each of the regulated fixed line services, and additionally separates ULLS into effectively two services, that is ULLS Bands 1 to 3 and ULLS Band 4. These are separate services for the purposes of setting prices and therefore require separate allocators. This adjustment to the services has resulted in flow through adjustments in several other worksheets.

These adjustments are listed below for each affected worksheet.

B. Dimensions & Results

Although this worksheet is not required to calculate prices for FY2015-19, it is retained to show calculations for the period prior to FY2015. Changes have been made to this worksheet only to the extent necessary to account for incorporation of the new allocation framework so that the prices for the previous regulatory period are still calculated.

All tables under section B.2 have had adjustments made to account for the seven services now included in the FLSM FY2015-19 (including the two separate ULLS services), and the formulae in these tables have been adjusted to refer to the correct cells in other worksheets, and calculate in the correct units once the adjustment for splitting the ULLS service into the bands has been made. These prices are for the previous regulatory period and have been retained for information purposes.

C. Masterlists

Table C.3 Services (rows 76 to 85) has been updated to account for the new allocation factors between ULLS Band 1-3 and ULLS Band 4. This has been allowed for by splitting the service into two separate services to be costed from FY2015 onwards. The calculations for the overall average ULLS cost, and geographic allocation used for the current regulatory period are still applied up to FY2014.

The updated services table is shown in Figure 10 below.

[11] Telstra, *Cost Allocation Framework for the ACCC Fixed Line Services Model: Framework and Model Guide* (Version 1), July 2014 (provided to the ACCC on 4 July 2014).
[12] Telstra, *Cost Allocation Framework for the ACCC Fixed Line Services Model: Framework and Model Guide* (Version 1), July 2014 (provided to the ACCC on 4 July 2014).

Figure 10: Updated services table

C.3 Services

Code	Service	Unit	Abbreviation	Price Unit
S01	Unconditioned Local Loop Service Band 1 - 3	Line	ULLB13	$ / month
S02	Unconditioned Local Loop Service Band 4	Line	ULLB4	$ / month
S03	Wholesale Line Rental	Line	WLR	$ / month
S04	PSTN FOAS & FTAS	Minute	PSTN	c / minute
S05	Local Carriage Service	Minute	LCS	c / call
S06	Line Sharing Service	Line	LSS	$ / month
S07	Wholesale ADSL	SIO	WADSL	$ / month

Note that the unit for Local Carriage Service has been amended from Call to Minute as the demand used in the model is actually in minutes of use and is converted to number of calls using the Average Call Duration.

D. Geo Cost-based pricing

This worksheet contains the original ULLS and WLR geographic de-averaging calculations. They remain active for the period up to the end of FY2014. Some adjustments were necessary due to the splitting of the ULLS service into two separate services. However, beyond FY2014, these de-averaging calculations are no longer required.

In Table D.1.2, formulae in rows 26 and 33 (total ULLS and WLR SIOs) needed to be adjusted to keep values consistent with the previous forecasts. This is shown in Figure 11 below.

Figure 11: Hard-coding of total SIOs for ULLS and WLR

D.1.2 Estimated Band SIOs

	Y01 2009/2010	Y02 2010/2011	Y03 2011/2012	Y04 2012/2013	Y05 2013/2014
ULLS					
Band 1	35,061	42,073	46,281	48,595	51,024
Band 2	780,459	936,551	1,030,206	1,081,716	1,135,802
Band 3	11,689	14,027	15,429	16,201	17,011
Band 4	124	149	164	172	180
Total	827,333	992,800	1,092,080	1,146,684	1,204,018
WLR					
Band 1	42,549	41,911	41,282	40,663	40,053
Band 2	844,712	832,041	819,560	807,267	795,158
Band 3	274,935	270,811	266,749	262,748	258,807
Band 4	90,588	89,229	87,891	86,572	85,274
Total	1,252,784	1,233,992	1,215,482	1,197,250	1,179,291

Additionally, the formulae in Tables D.5.1 and D.5.2 were adjusted to refer to the correct cells in the worksheet '7. Service Costs' once changes had been made in that worksheet to account for the amended services list (see below).

E. Allocation Factors Calc

This worksheet contains the FLSM FY2012-14 allocation calculations. They remain in use for the period up to end of FY2014, but required some adjustments due to the splitting of the ULLS service into two separate services. Beyond FY2014, allocation calculations are set out in separate worksheets ('Allocation Summary' and 'Allocations').

The following adjustments were necessary due to the splitting of the ULLS service into two separate services:

- Formulae in Table E.1.3 were adjusted to refer to the correct cells in the worksheet '7. Service Costs' once changes had been made in that worksheet (see below);
- Formulae were adjusted in Tables E.3.2 and E.5.2 to refer to the correct cells in the worksheet '5. Service Demand' once changes had been made in that worksheet;
- a new column was added to Table E.5.3 to reflect the splitting of the ULLS into two separate services; and
- In Table E.9 the column for the ULLS Band 4 service contains no allocations for the period to FY2014. From FY2015, worksheets which refer to allocation factors link to the worksheet 'Allocation Summary'. This contains the results of the new allocation calculations. This is shown in Figure 12 below.

Figure 12: Amended cost allocation factors table

E.9 FLSM Cost Allocation Factors

Y01	2009/2010	S01	S02	S03	S04	S05
Code	Asset Class	ULLB13	ULLB4	WLR	PSTN	LCS
CAN Asset Class						
CA01	Ducts and pipes	5.90%		12.10%		
CA02	Copper cables	5.90%		12.10%		
CA03	Other cables	-		13.18%		
CA04	Pair gain systems	-		12.97%		
CA05	CAN Radio Bearer Equipment	-		-		
CA06	Other CAN assets	7.71%		12.24%		
CA07	Other Communications Plant and Equipment	3.47%		5.25%		
CA08	Network Land	8.05%		12.19%		
CA09	Network Buildings/Support	8.05%		12.19%		
CA10	Indirect Capital Assets	4.82%		11.52%		
Core Asset Class						
CO01	Switching Equipment - Local			1.31%	10.58%	4.78%
CO02	Switching Equipment - Trunk				23.80%	3.77%
CO03	Switching Equipment - Other				22.23%	5.15%
CO04	Inter-exchange Cables				3.45%	1.39%
CO05	Transmission Equipment				8.59%	3.00%
CO06	Core Radio Bearer Equipment				3.64%	1.49%
CO07	Other Communications Plant and Equipment				7.80%	3.08%
CO08	Network Land				7.80%	3.08%
CO09	Network Buildings/Support				7.80%	3.08%
CO10	Indirect Capital Assets			0.41%	7.80%	3.08%
CO11	LSS equipment					
CO12	Data Equipment					

G. Revenue Disaggregate

Table G.1.2 (Return on capital) has had formulas amended to refer to the WACC used for the new regulatory period.

Table G.1.2 (Return on capital) and Table G.1.3 (Return of capital) have had formulas amended to link to the correct cells in worksheet 8. RAB Roll-Forward.

Table G.2.1 (Revenue Requirement Allocated to Services) has been amended to reflect the splitting of ULLS into two separate services. This involved:

- re-labelling Table S01 as 'Unconditioned Local Loop Service Band 1 -3';
- inserting a new Table S02, labelled 'Unconditioned Local Loop Service Band 4';
- consequential re-numbering of the tables below; and
- amending of formulas to refer to correct cells.

The revised Table G.2.1 is shown in Figure 13 below, with data columns omitted.

Figure 13: Revised Table G.2.1

G.2.1 Revenue Requirement Allocated to Services

Code	Service	Building Block
S01	Unconditioned Local Loop Service Band 1 - 3	Operating expenditure
		Return on capital
		Return of capital
		Tax payments
		Total
S02	Unconditioned Local Loop Service Band 4	Operating expenditure
		Return on capital
		Return of capital
		Tax payments
		Total
S03	Wholesale Line Rental	Operating expenditure
		Return on capital
		Return of capital
		Tax payments
		Total
S04	PSTN Originating & Terminating Access	Operating expenditure
		Return on capital
		Return of capital
		Tax payments
		Total
S05	Local Carriage Service	Operating expenditure
		Return on capital
		Return of capital
		Tax payments
		Total
S06	Line Sharing Service	Operating expenditure
		Return on capital
		Return of capital
		Tax payments
		Total
S07	Wholesale ADSL	Operating expenditure
		Return on capital
		Return of capital
		Tax payments
		Total
	Total for all declared services	

Table G.2.3 (Revenue Requirement for other regulated and unregulated services) has had formulas amended to include all of the services in Table G.2.1.

Tables G.3.7 through to G.3.12 have been renumbered and moved to Section G.4 (Detailed Revenue Requirement Calculations) and amended to reflect the splitting of ULLS into two separate services. This involved:

- re-labelling Table G.4.1 as ‘S01 Unconditioned Local Loop Service Band 1 -3’;
- inserting a new Table G.4.2, labelled ‘S02 Unconditioned Local Loop Service Band 4’; and

- consequential re-numbering of the tables below.

Section G.3 (Detailed Revenue Requirement Calculations - Allocation Factors) has been similarly amended to reflect the splitting of ULLS into two separate services. This involved:

- re-labelling Table G.3.1 as 'S01 Unconditioned Local Loop Service Band 1 -3';
- inserting a new Table G.3.2, labelled 'S02 Unconditioned Local Loop Service Band 4'; and
- consequential re-numbering of the tables below.

Each of Tables G.3.1 through to G.3.7 have also been amended to extend formulae to cover the FY2015-19 period, and from FY2015 onwards these formulae have been amended so that they look up the new 'Allocation Summary' worksheet (rather than the 'E. Allocation Factors Calc' worksheet). For example, for FY2015 the allocation of ducts and pipes costs to WLR (cell M381) looks up the Allocation Summary worksheet using the following formula:

$$VLOOKUP(\$C381,'Allocation\ Summary'!\$B\$62{:}\$L\$102,\$W381,FALSE)$$

J. WADSL price structure

In table J.1.1, the formulae have been adjusted to refer to the correct cells. They remain in use for the period up to end of FY2014. Beyond FY2014, WADSL price calculations are set out in worksheet 'Price Summary'.

5. Service Demand

In Table 5.1, the list of services has been updated to include the splitting of ULLS into the bands.

Additionally, a new Table 5.3 (reproduced as Figure 14 below) has been added to include all demand forecasts required for the new 'Allocations' worksheet. These demand forecasts link to the new 'Demand Forecasts' worksheet (discussed below).

The forecasts for FY2015-19 in Tables 5.1 and 5.2 now refer to either Table 5.3 or the worksheet 'Demand Forecasts'.

New named ranges have been defined in this worksheet which are used in the calculation of the allocations.

7. Service Costs

Tables 7.2.1, 7.2.2, 7.2.3 and 7.3.2 have been updated with the amended service list, and the formulae have been adjusted to refer to the correct cells and calculate in the correct units.

The inflation factors in Table 7.2.3 refer to the updated inflation values in the worksheet '1. Economic Parameters'.

In table 7.3.1, allocation factors for FY2015-19 (cells Q383 to W628) have been linked to the new 'Allocation Summary' worksheet. Prior to FY2015, existing linkages to the 'E. Allocation Factors Calc' worksheet have been retained.

Figure 14: Demand forecasts used in allocation calculations

5.3 Annual Demand used in Allocation Calculation

Services	Unit	Y05 FY2014	Y06 FY2015	Y07 FY2016	Y08 FY2017	Y09 FY2018	Y10 FY2019
PSTN Retail access	SIO	[redacted]					
PSTN local calls	MOU						
PSTN national STD	MOU						
PSTN international	MOU						
PSTN fixed to mobile	MOU						
PSTN OTA	MOU						
LCS	MOU						
ISDN-BRI	SIO						
ISDN-PRI	SIO						
ISDN voice	MOU						
ULLS	SIO						
LSS	SIO						
WLR	SIO						
ADSL retail	SIO						
ADSL wholesale	SIO						
Other DSL	SIO						
PSTN Retail access Band 1	SIO						
PSTN Retail access Band 2	SIO						
PSTN Retail access Band 3	SIO						
PSTN Retail access Band 4	SIO						
ISDN-BRI Band 1	SIO						
ISDN-BRI Band 2	SIO						
ISDN-BRI Band 3	SIO						
ISDN-BRI Band 4	SIO						
ISDN-PRI Band 1	SIO						
ISDN-PRI Band 2	SIO						
ISDN-PRI Band 3	SIO						
ISDN-PRI Band 4	SIO						
ULLS Band 1	SIO						
ULLS Band 2	SIO						
ULLS Band 3	SIO						
ULLS Band 4	SIO						
WLR Band 1	SIO						
WLR Band 2	SIO						
WLR Band 3	SIO						
WLR Band 4	SIO						
Other DSL Band 1	SIO						
Other DSL Band 2	SIO						
Other DSL Band 3	SIO						
Other DSL Band 4	SIO						

5 Amendments made in order to calculate the impact of asset disposals correctly

In updating the model, Telstra identified an error in how asset disposals were treated. This error meant that the model could not function properly wherever the value of asset disposals exceeded the value of asset additions in any given year.

In order to correctly allow for any disposals in the upcoming regulatory period, it was necessary to make adjustments to how the model currently uses any disposal values entered. The required adjustments are explained below for each affected worksheet.

3. Additions, Disposals & Opex

In the FLSM FY2012-14, there was a single table headed 'Asset Class Disposals' in the '3. Additions, Disposals & Opex' worksheet.

So that the model correctly accounted for assets disposals, two separate tables were required, one for disposals of *existing* assets and another for disposals of *new* assets. Existing assets are defined as assets which were present in the valuation of the RAB in 2009, while new assets are defined as assets which were added to the RAB as capital expenditure from that point. It was necessary to split the asset groups in this way due to the different asset lives which impact depreciation (or appreciation).

Table 3.3 has been re-named 'Asset Class Disposals – existing assets'. This table contains values for existing assets forecast to be disposed of, based on the selected NBN rollout scenario. To account for asset disposals for new assets, a new table 3.4 has been added, titled 'Asset Class Disposals - new assets'. These tables are illustrated in Figure 15 and Figure 16 respectively.

The only asset class for which there is forecast to be disposals of either existing or new assets is Copper Cables (CA02). For this asset class, the value of forecast asset disposals for existing assets in each year from FY2015 onwards is calculated in accordance with the following formula:

$$Forecast\ disposals_t = \%\ transferred_t \times (RAB(existing)_t - Dep(existing)_t)$$

where:

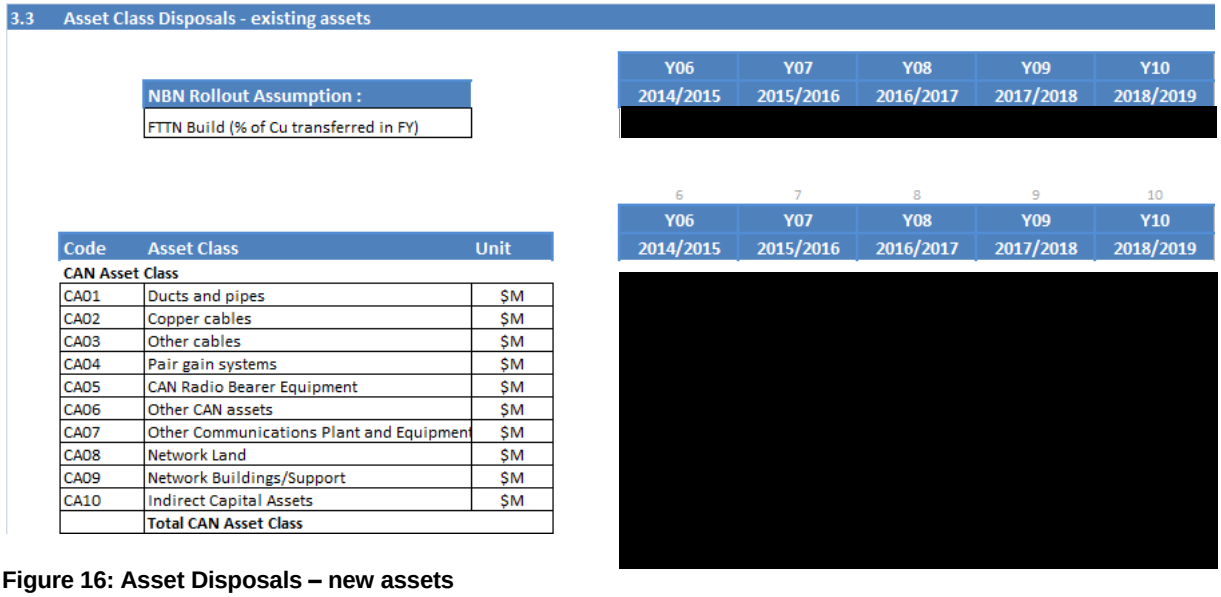
% transferred$_t$ is the percentage of copper cable assets forecast to be transferred in year t, based on the chosen NBN rollout scenario (this percentage links to the NBN Rollout Parameters worksheet, which in turn links to the 'NBN Scenario Selection' worksheet);

RAB (existing)$_t$ is the opening RAB for existing assets in year t; and

Dep (existing)$_t$ is regulatory depreciation for existing assets in year t.

The value of forecast asset disposals for new assets in each year from FY2015 onwards is calculated in the same way, except that the opening RAB and depreciation values for new assets are used.

Figure 15: Asset Disposals – existing assets



3.3 Asset Class Disposals - existing assets

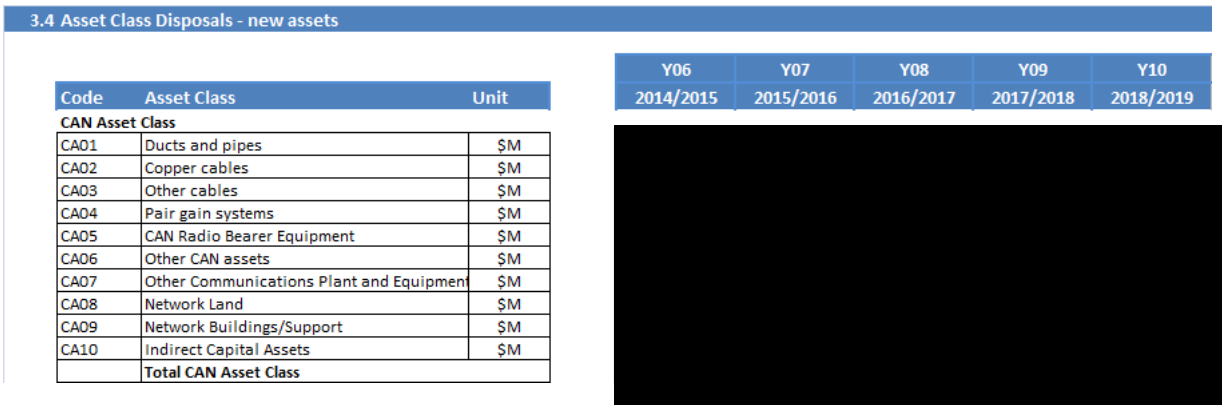
NBN Rollout Assumption :
FTTN Build (% of Cu transferred in FY)

Y06	Y07	Y08	Y09	Y10
2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
[redacted]				

Code	Asset Class	Unit
CAN Asset Class		
CA01	Ducts and pipes	$M
CA02	Copper cables	$M
CA03	Other cables	$M
CA04	Pair gain systems	$M
CA05	CAN Radio Bearer Equipment	$M
CA06	Other CAN assets	$M
CA07	Other Communications Plant and Equipment	$M
CA08	Network Land	$M
CA09	Network Buildings/Support	$M
CA10	Indirect Capital Assets	$M
	Total CAN Asset Class	

6	7	8	9	10
Y06	Y07	Y08	Y09	Y10
2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
[redacted]				

Figure 16: Asset Disposals – new assets



3.4 Asset Class Disposals - new assets

Code	Asset Class	Unit
CAN Asset Class		
CA01	Ducts and pipes	$M
CA02	Copper cables	$M
CA03	Other cables	$M
CA04	Pair gain systems	$M
CA05	CAN Radio Bearer Equipment	$M
CA06	Other CAN assets	$M
CA07	Other Communications Plant and Equipment	$M
CA08	Network Land	$M
CA09	Network Buildings/Support	$M
CA10	Indirect Capital Assets	$M
	Total CAN Asset Class	

Y06	Y07	Y08	Y09	Y10
2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
[redacted]				

8. RAB Roll-Forward

Table 8.1.3 (Asset Class Disposals) has been renamed 'Asset Class Disposals – Existing Assets'. This table now only contains values for existing assets forecast to be disposed of, based on the selected NBN rollout scenario. The values in this table now look up those in Table 3.3 of the '3. Additions, Disposals & Opex' worksheet.

An additional table, Table 8.1.4 Asset Class Disposals – New Assets has been created which links to Table 3.4 of the '3. Additions, Disposals & Opex' worksheet and contains the calculated values of disposals of assets purchased since 2009.

Table 8.2.1 (Net Additions) has been removed as the disposals methodology has been amended to net disposals off the opening RAB value for the appropriate asset group (i.e. existing assets new assets). This is a change from the previous methodology, whereby disposals were netted off new capital expenditure, to derive net additions. Since Table 8.2.1 contained the calculation accounting for the timing of capital spend, formulae in Table 8.1.2 Asset Class Additions have been adjusted by $(1+WACC)^{1/2}$ using the appropriate WACC for the period.

Tables 8.2.2 (Opening RAB), 8.2.3 (Regulatory Depreciation) and 8.2.4 (Closing RAB) have each been split into 'Existing Assets' and 'New Assets' as the two groups of assets are dealt with separately with respect to depreciation and disposals.

Tables 8.3.7 to 8.3.11 have had the formulae for the asset life for each asset class adjusted to refer to the forecast asset lives inserted as above.

The roll forward RAB for existing assets was calculated by removing the disposal of existing assets and depreciation calculated on the previous year's closing RAB. The roll forward RAB for new assets wais calculated by aggregating the outputs of separate roll-forward models for capital additions and the disposal of new assets.

Asset disposals are treated within the model as a "negative addition". This allows the model to determine the depreciation and closing RAB for each asset type, taking into account additions and disposals of that asset type in each year. The model assumes that the disposal of any new assets will be valued at the written down value. This is because the value of the asset rolled into the RAB will equate to the actual cost, as opposed to an estimate of the assets value. Hence, it is assumed that the WDV will reflect the asset's market value.

The Closing RAB (Existing Assets) is calculated in Table 8.2.4 Closing RAB (Existing Assets) and can be summarised with the following formulas:

$$Opening\ RAB_n = Closing\ RAB_{n-1}$$

$$Dep_n = if\left[(l^r < 0), Opening\ RAB_n, \frac{Opening\ RAB_n}{l^r}\right]$$

$$Closing\ RAB_n = Opening\ RAB_n - Asset\ Disposals^e - Dep_n$$

where, l^r = remaining asset life

$Asset\ Disposals^e$ = Disposal of existing assets

The Closing RAB (New Assets) can be summarised as:

$$Opening\ RAB_n = Closing\ RAB_{n-1}$$

$$Dep_n = \sum Dep_n^a + \sum Dep_n^d$$

$$Dep_n^a = if\left[(l^a - n) < 1, Opening\ RAB_n^a, \frac{Asset\ additions_1}{l^a}\right]$$

$$Dep_n^d = if\left[(l^a - n) < 1, Opening\ RAB_n^d, \frac{Asset\ additions_1}{l^a}\right]$$

$$Closing\ RAB\ {}^{a}_{1} = Asset\ additions_1$$

$$Closing\ RAB\ {}^{a}_{n(where\ n\geq 1)} = Opening\ RAB_n^a - Dep_n^a$$

$$Closing\ RAB\ {}^{d}_{1} = Asset\ additions_1$$

$$Closing\ RAB\ {}^{d}_{n(where\ n\geq 1)} = Opening\ RAB_n^d - Dep_n^d$$

where: Dep_n^a = Regulatory depreciation on asset additions

Dep_n^d = Regulatory depreciation on asset disposals

l^a = average asset life

To implement the Closing RAB calculation for New Assets additional tables have been inserted into the worksheet - new tables 8.4.2 to 8.4.13 have been added (copied from Tables 8.3.2 to 8.3.13 which calculate the Rollforward of existing assets), to calculate the roll forward of the disposal of assets each year.

9. RAB Roll-Forward for Tax

Adjustments have been made mirroring those made to 8. RAB Roll-Forward.

6 Accommodation of expenditure, demand and asset lives forecasts for FY2015-19

As explained in Telstra's submission on primary prices, Telstra has revised its forecasts of operating expenditure, capital expenditure and demand for the fixed line network for FY2015-19, using its Forecast Model.[13] Importantly, relationships between the NBN rollout, demand for fixed line services and expenditure requirements have been codified in the Forecast Model, so that if the NBN rollout scenario changes, forecasts of demand and expenditure requirements (and consequently the calculated revenue requirement) will update in a consistent manner.

This has necessitated some changes to the model, in order to incorporate the revised forecasts and link them to existing calculation worksheets. These changes are explained below.

6.1 Inclusion of new expenditure and demand forecast worksheets

Three new worksheets have been added to the FLSM FY2015-19, to show forecasts of demand, capital expenditure and operating expenditure for FY2015-19, based on the selected NBN rollout scenario. The three new worksheets are:

- 'Opex Forecasts';
- 'Capex Forecasts'; and
- 'Demand Forecasts'.

These three new worksheets have been added immediately after '10. Tax Liabilities'.

These three worksheets were included in the Forecast Model submitted to the ACCC with Telstra's submission on primary prices, and the operation of these worksheets was explained in detail in the accompanying Forecast Model Documentation.[14]

The NBN rollout assumptions in these worksheets link to those set out in the 'NBN Rollout Parameters' worksheet. These assumptions will automatically update each time the NBN rollout scenario is changed.

6.2 Linking existing worksheets to the new forecast worksheets

A number of consequential changes to existing worksheets were required to ensure appropriate linkages to the new forecast worksheets. These are set out below for each affected worksheet.

3. Additions, Disposals & Opex

In Table 3.1 of this worksheet, formulae have been updated to look up the new 'Opex Forecasts' worksheet from FY2015. Prior to FY2015, existing linkages to the 'F. Opex Allocations' worksheet are retained.

For example, operating costs for the ducts and pipes asset class for FY2015 (cell M13) now looks up the 'Opex Forecasts' worksheet according to the following formula:

$$VLOOKUP(\$C13,'Opex\ Forecasts'!\$C\$25:\$K\$71,M\$3,FALSE)/1000000$$

Similarly, in table 3.2, formulae have been updated to look up the new 'Capex Forecasts' worksheet from FY2015 onwards. Prior to FY2015, existing hard coded values are retained.

[13] Telstra, *Public inquiry into final access determinations for fixed line services—primary prices: Response to Discussion Paper,* 3 October 2014, sections 5, 6, 7 and 8.

[14] Telstra, *Public inquiry into final access determinations for fixed line services—primary prices: Response to Discussion Paper,* 3 October 2014, Appendix 4. The Forecast Model was submitted as Appendix 3.

5. Service Demand

In tables 5.1 and 5.2, formulae have been updated to link to the new 'Demand Forecasts' worksheet from FY2015, either directly or indirectly through the new table 5.3. Prior to FY2015, existing hard coded values and linkages to the 'D. Geo Cost-based pricing' worksheet have been retained.

Additionally, as noted in Section 4.2, a new table 5.3 has been added to include all demand forecasts required for the new 'Allocations' worksheet. These forecasts are more granular than those in the existing tables 5.1 and 5.2.

F. Opex allocations

This worksheet was used to allocate total operating expenditure to asset classes for the period to FY2014. This will not be required beyond FY2014, because Telstra has now developed a bottom-up forecasting methodology which provides for forecasts in each relevant asset class.

Although it is not required for determining service prices for the forthcoming period, this worksheet has been retained to ensure that the previous pricing calculations remain in the FLSM FY2015-19.

6.3 Asset lives for new capital expenditure to be undertaken over the period FY2015-19

Amendments to some worksheets are required in order to incorporate asset lives for new capital expenditure forecast to be undertaken over the next regulatory period. As the asset lives for new assets are in some cases different to the asset lives assumed for existing assets, they need to be separately identified and factored into calculations.

Asset lives for new capital expenditure are as set out in Telstra's response to the BBM RKR Notice.[15] The method and assumptions used to determine these asset lives is explained in detail in the explanatory statement accompanying Telstra's BBM RKR response.[16]

The changes necessary to incorporate asset lives for new capital expenditure are identified below for each affected worksheet.

2. RAB

This worksheet has been expanded to include the asset lives for new capital expenditure to be undertaken in the FY2015-19 period, for each asset class. These are set out in columns M, N, O, P and Q (reproduced in Figure 17 below).

[15] Telstra, *Fixed Line Services Final Access Determinations Inquiry – confidential response to information request under the BBM RKR*, 25 November 2013.
[16] Telstra, *Final Access Determinations (FADs) Inquiry – confidential response to information request under the BBM RKR*, 25 November 2013, pp 76-79.

Figure 17: Tables containing asset lives for new capital expenditure

2.1 Regulatory Asset Base -- Opening Value and Parameters

Code	Asset Class	Depreciated Value at 30 June 2009 ($M)	Average Asset Life (years)	Remaining Asset Life (years)	Depreciated proportion at 30 June 2009	Average Asset Life (years) 2014/15 Capex	Average Asset Life (years) 2015/16 Capex	Average Asset Life (years) 2016/17 Capex	Average Asset Life (years) 2017/18 Capex	Average Asset Life (years) 2018/19 Capex
						5	6	7	8	9
CAN Asset Class										
CA01	Ducts and pipes	[redacted]	35.00	[redacted]	[redacted]	[redacted]				
CA02	Copper cables		20.00							
CA03	Other cables		20.00							
CA04	Pair gain systems		12.00							
CA05	CAN Radio Bearer Equipment		12.00							
CA06	Other CAN assets		12.00							
CA07	Other Communications Plant and Equipment									
CA08	Network Land		10,000.00							
CA09	Network Buildings/Support									
CA10	Indirect Capital Assets		10.00							
	Total									
Core Asset Class										
CO01	Switching Equipment - Local		27.00							
CO02	Switching Equipment - Trunk		25.00							
CO03	Switching Equipment - Other		20.00							
CO04	Inter-exchange Cables		38.00							
CO05	Transmission Equipment									
CO06	Core Radio Bearer Equipment		16.00							
CO07	Other Communications Plant and Equipment									
CO08	Network Land		10,000.00							
CO09	Network Buildings/Support									
CO10	Indirect Capital Assets		10.00							
CO11	LSS equipment		-							
CO12	Data Equipment		6.00							
	Total									

8. RAB Roll-Forward

Table 8.1.1 has also been expanded to include asset lives for new capital expenditure to be undertaken in the FY2015-19 period, for each asset class. These are set out in cells M12 to Q47, which look up the newly inserted tables in the '2. RAB' worksheet.

Consequential changes have been made to tables 8.3.7 to 8.3.11, to adjust formulae to refer to the asset lives for new capital expenditure, inserted as above. For example in table 8.3.7, asset lives for FY2015 capital expenditure (cells E1598 to E1631) look up asset lives newly inserted in table 8.1.1, in accordance with the following formula:

$$VLOOKUP(C1598, \$C\$14{:}\$Q\$55, 11, FALSE)$$

Corresponding formulae were used to link the asset lives for capital expenditure in FY2016, FY2017, FY2018 and FY2019 to those in table 8.1.1.

9. RAB Roll-Forward for Tax

As in the RAB Roll-Forward worksheet, table 9.1.1 has been expanded to include asset lives for new capital expenditure to be undertaken in the FY2015-19 period, for each asset class. These are set out in cells M12 to Q47, which look up the newly inserted tables in the '2. RAB' worksheet (referred to above).

Consequential changes have been made to tables 9.3.7 to 9.3.11, to adjust formulae to refer to the asset lives for new capital expenditure, inserted as above (similar to above for worksheet '8. RAB Roll-Forward').

7 Other changes

Various other changes have been made. Specifically, Telstra have updated economic parameters where necessary, and simplified the layout of the model.

C. Masterlists

Certain model dimensions – including the model period and the number of asset classes – have been moved from 'B. Dimensions & Results' into this worksheet (rows 7 to 19). This has been done to simplify the layout of the FLSM FY2015-19 and reduce the number of worksheets needed to calculate prices.

For the same reason, the model base year dimension has been moved from the worksheet '2. RAB' into this worksheet. This now appears in rows 22 to 24.

Table C.3 (Services) has been updated to reflect the inclusion of two ULLS services (Bands 1-3 and Band 4) and a new column has been added containing the Price Unit for each service. The named range Services has been extended to include this column (cells C78 to G85).

1. Economic Parameters

Tables 1.1.1 and 1.1.2 (WACC Parameters) have had additional columns inserted to include the WACC inputs used in calculations for FY2015-19 (see Figure 18 below). The values for FY2015-19 are as proposed in Telstra's submission on primary prices.[17]

[17] Telstra, *Public inquiry into final access determinations for fixed line services—primary prices: Response to Discussion Paper*, 3 October 2014, section 10.

Figure 18: Updated WACC Parameters tables

1.1 WACC Parameters

1.1.1

Input Values	FY12-FY14	FY15-FY19
Nominal Risk Free Rate	5.16%	3.66%
Real Risk Free Rate	2.55%	0.92%
Debt ratio	40%	40%
Equity ratio (calculated)	60%	60%
Nominal Debt Risk Premium	2.0591%	1.40%
Debt Raising Costs	0.081%	0.07%
Equity issuance costs	0.0%	0.00%
Nominal Market Risk Premium	6.0%	6.50%
Utilisation of Imputation (Franking) Credits	0.45	0.25
Expected inflation	2.55%	2.72%
Corporate Tax Rate	30%	30%
Equity Beta	0.7	0.8
IAD real vanilla WACC	6.252%	

1.1.2

Calculated Values	FY12-FY14	FY15-FY19
Real Risk Free Rate	2.55%	0.92%
Nominal cost of debt	7.30%	5.13%
Real cost of debt	4.64%	2.35%
Effective tax rate for equity (calculated)		
Debt/Equity ratio	66.67%	66.67%
Nominal cost of equity	9.36%	8.86%
Real cost of equity	6.64%	5.98%
Nominal vanilla WACC	8.5360%	7.37%
Real vanilla WACC	5.841%	4.525%

Tables 1.2.1 and 1.2.2 (WACC Parameters for WADSL) have been similarly updated, as shown in Figure 19 below.

Figure 19: Updated WACC Parameters for WADSL tables

1.2 WACC Parameters for WADSL

1.2.1

Input Values	FY12-FY14	FY15-FY19
Nominal Risk Free Rate	3.19%	3.66%
Real Risk Free Rate	0.70%	0.92%
Debt ratio	40%	40%
Equity ratio (calculated)	60%	60%
Nominal Debt Risk Premium	1.47%	1.400%
Debt Raising Costs	0.074%	0.070%
Equity issuance costs	0.0%	0.0%
Nominal Market Risk Premium	6.0%	6.5%
Utilisation of Imputation (Franking) Credits	0.45	0.25
Expected inflation	2.47%	2.72%
Corporate Tax Rate	30%	30%
Equity Beta	0.7	0.8
IAD real vanilla WACC	6.252%	

1.2.2

Calculated Values	FY12-FY14	FY15-FY19
Real Risk Free Rate	0.70%	0.92%
Nominal cost of debt	4.74%	5.13%
Real cost of debt	2.21%	2.35%
Effective tax rate for equity (calculated)		
Debt/Equity ratio	66.67%	66.67%
Nominal cost of equity	7.39%	8.86%
Real cost of equity	4.80%	5.98%
Nominal vanilla WACC	6.3314%	7.3680%
Real vanilla WACC	3.763%	4.525%

A new table 1.3 has also been added to this worksheet, containing annual inflation factors and cumulative inflation factors to be used in the FLSM FY2015-19. This new table is shown in Figure 20 below.

Figure 20: Inflation rates table

1.3 Inflation Rates

	Financial Year	Inflation Rate	Cumulative Inflation Rate
	2008/2009	2.55%	
Y01	2009/2010	2.55%	102.55%
Y02	2010/2011	2.55%	105.16%
Y03	2011/2012	2.55%	107.83%
Y04	2012/2013	2.55%	110.58%
Y05	2013/2014	2.70%	113.39%
Y06	2014/2015	2.70%	116.46%
Y07	2015/2016	2.80%	119.60%
Y08	2016/2017	2.70%	122.95%
Y09	2017/2018	2.70%	126.27%
Y10	2018/2019	2.70%	129.68%
Y11	2019/2020	2.55%	133.18%
Y12	2020/2021	2.55%	136.57%

New named ranges have been defined in this worksheet which are used in the calculation of prices: Corporate_Tax_Rate_FY1519, Cost_of_Debt_FY1519, Debt_Ratio_FY1519, Infl_per_yr, Value_of_imputation_credits_FY1519 and WACC_FY1519.

5. Service Demand

In table 5.1, the unit for Local Carriage Service demand in cell E15 has been updated to Minute from Call as the units are now sourced from the worksheet 'C. Masterlists'. The demand in this table for Local Carriage Service was always the number of minutes, and the average holding time was used to convert to number of calls. The updated label now reflects this.

6. Revenue Requirement

In Table 6.1.1, Part 1 (Return on Capital) formulae have been amended to refer to the cells in worksheet 8. RAB Roll-Forward, and formulae for FY2015-19 (columns M, N, O, P and Q) have been updated to refer to the WACC for FY2015-19. As noted above, the updated WACC parameters have been included in the '1. Economic Parameters' worksheet.

Consequential changes have been made to formulae in Table 6.1.3 to refer to the correct cells in the worksheet '8. RAB Roll-Forward'. This was necessary due to changes to the structure of that worksheet, as explained in section 5 above.

In Table 6.1.4, formulae have been updated to refer to the new inflation table in worksheet '1. Economic Parameters' (Table 1.3) by including a reference to the named range 'Infl_per_yr' in the formulae in row 160.

7. Service Costs

The cumulative inflation index applied in table 7.2.3 (Service Prices (Adjusted for Inflation)) has been updated to link to the new Table 1.3 in the worksheet '1. Economic Parameters' by including a reference to the named range 'Infl_per_yr' in the formulae in row 112.

8. RAB Roll-Forward

In table 8.1.2 (Asset Class Additions):

- formulae for the period prior to FY2015 have been adjusted to refer to the WACC for that period, as set out in worksheet '1. Economic Parameters'; and
- formulae for FY2015-19 have been adjusted to refer to the WACC for that period, as set out in worksheet '1. Economic Parameters'.

9. RAB Roll-Forward for Tax

In Table 9.1.2 (Inflation) formulae for FY2015-19 have been adjusted to link to the new table 1.3 in the worksheet '1. Economic Parameters' by including a reference to the named range 'Infl_per_yr' in the formulae in row 61.

10. Tax Liabilities

In Table 10.1.1 (Inflation Indices) formulae for FY2015-19 have been adjusted to link to the new table 1.3 in the worksheet '1. Economic Parameters' by including a reference to the named range 'Infl_per_yr' in the formulae in row 14.

Consequential changes have been made to formulae in Table 10.1.2 to refer to the correct cells in the worksheet '8. RAB Roll-Forward'. This was necessary due to changes to the structure of that worksheet, as explained in section 5 above.

Consequential changes have also been made to formulae in Table 10.1.6 to refer to the correct cells in the worksheet '9. RAB Roll-Forward for Tax'. This was necessary due to changes to the structure of that worksheet, as explained in section 5 above.

In Table 10.2.1 (Debt) formulae for FY2015-19 have been adjusted to link to the assumed debt ratio for this period, as set out in Table 1.1.1 in the worksheet '1. Economic Parameters'. This is achieved by including a reference to the named range 'Debt_ratio_FY1519' in the formulae in rows 178 and 180.

In Table 10.2.2, Part 3 (Interest (Nominal)) formulae for FY2015-19 have been adjusted to link to the cost of debt for this period, as set out in table 1.1.2 in the worksheet '1. Economic Parameters'. This is achieved by including a reference to the named range 'Cost_of_debt_FY1519' in the formulae in rows 205 and 207.

In Tables 10.2.6 Tax Payable and 10.2.7 Intermediate Tax Calculation, the formulae for FY2015-19 have been adjusted to link to the corporate tax rate for this period, as set out in Table 1.1.1 in the worksheet '1. Economic Parameters'. This is achieved by including a reference to the named range 'Corporate_Tax_Rate_FY1519' in the formulae in rows 253, 255, 265 and 267.