

Optus Submission to
Australian Competition and Consumer Commission
on
Transmission Network Cost Model

June 2007

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1. Introduction

- 1.1 Optus welcomes the opportunity to respond to the ACCC's May 2007 discussion paper relating to the 'transmission network cost model'. Optus' submission incorporates two sections:
- Section 2 - submissions regarding the overall configuration of the transmission network cost model; and
 - Section 3 - responses to the Commission's specific questions.
- 1.2 At this stage the Commission has sought industry comment on various elements of the transmission cost model, including the appropriateness of the model specification, certain parameters contained in the model, and some indication of the empirical inputs that could be used in the model.
- 1.3 Optus believes that the questions posed by this discussion paper place a significant burden on interested parties as all of the parameters in the model are "indicative only" and "not provided as opinion or advice...in regards to specific circumstances or results".^{1 2} This means that for Optus, or other parties, to provide constructive comments on the model they must insert their own data and/or use estimations. Optus therefore raises issue with the considerable amount of additional internal work required to produce a working model. Optus suggests the Commission develop case-studies of scenarios to provide all parties with a clearer understanding of the results of the model.
- 1.4 Optus further highlights that in the review of the Mobile Terminating Access Service (MTAS) the WIK mobile cost model at least sourced or estimated values for key parameters.³ Optus submits that, in comparison, the transmission cost model provided is significantly under-developed.
- 1.5 A more reasonable process would have involved the model including values that had been gathered from known data sources – for example historical monitoring data (provided to the Commission until 2004) or benchmarking type approaches. Such an approach would have provided both carriers and the Commission with a greater knowledge of, in the least, approximate values for parameters.
- 1.6 Optus submits that the Commission needs to provide carriers with significantly more detailed notes on all aspects of the model. The current explanatory documentation provide minimal, in some cases negligible detail on the network elements and parameters modelled. Optus has therefore found it extremely difficult to provide comment on many of the parameters in the model. Optus would be willing to provide the Commission with relevant data for each of the parameters in the model if the Commission clarifies how they were defined.

¹ ACCC (2007), *Transmission network cost model – discussion paper*, May 2007, page 16.

² GQ-AAS (2007), *Australian Competition and Consumer Commission Transmission Network Cost Model - Description of Operation*, April 2007, page i.

³ ACCC (2007), *Discussion Paper on the WIK Mobile Network and Cost Model to inform the MTAS Pricing Principles Determination 1 July 2007 to 30 June 2009*, February 2007.

- 1.7 Parameters of greatest concern to Optus are contained in the “Input Parameters” worksheet. Optus notes that the model is highly sensitive to these values however no explanation is given as to how they are defined.

2. Overall Configuration of the Transmission Network Cost Model

2.1 The Commission provided an overall statement on how it configured the transmission cost model. Specifically the Commission submitted that:

“The transmission cost model has been configured on Telstra’s optical fibre transmission network as the Commission understands that:

- *this network is based on current best-in-use technology;*
- *the architecture of this network broadly reflects that which other optical fibre transmission providers would develop (or already have developed) in order to supply transmission services;*
- *this network has the scale required for the purpose of access seekers requiring transmission capacity to a broad range of sites within Australia (including various capital to regional locations); and*
- *the primary driver of the need for transmission services is to serve access seekers that have DSLAMs located in Telstra exchanges.”⁴*

2.2 Optus provides a response to this statement according to the relevant questions posed by the Commission. However, in summary, Optus raises the following issues:

- Optus agrees with the Commission that the transmission model should be based on “best in use technology” as appropriate. However, Optus cannot confirm that Telstra’s network uses such technology. It is very difficult, if not impossible, for Optus to provide informed comment on Telstra’s fibre transmission network as Optus is not privy to such information.
- Optus agrees that the transmission model should incorporate a network architecture which can scale to meet the demands placed upon it. Optus cannot confirm that Telstra’s network, which the model is based upon, can scale to meet demand in its current configuration or without the injection of significant capital expenditure. Optus highlights that in the past it has observed significant delays in obtaining inter-exchange network (IEN) capacity along major trunk routes.
- Securing Telstra transmission services to support other carrier DSLAMs located in Telstra exchanges is not the primary driver of demand. Optus acquires a large number of IEN leases to provide connectivity between Optus transmission nodes where Optus does not have a suitable fibre route (e.g. Adelaide to Darwin, Melbourne to Hobart) or to provide path diversity to Optus’ primary route. Optus also leases a significant number of transmission services to support Optus/Telstra points of interconnection (POIs) and to provide access to Optus mobile base station and customer sites.

⁴ ACCC (2007), *Transmission network cost model – discussion paper*, May 2007, page 5.

3. Detailed Comments on the Commission's Transmission Network Cost Model

Summary

3.1 Optus has provided a detailed response to the Commission's specific questions on the transmission cost model. In summary, Optus submits that:

- The current explanatory documentation provides minimal, in some cases no detail on the network elements and parameters modelled and therefore it is not possible to provide comment on many of the parameters in the model.
- The Commission needs to provide further explanatory material that clearly details how parameters in the model were defined and calculated. Optus would then be able to provide detailed information in regards to the value of such parameters.
- The model should have been provisioned with approximate values based upon known data sources – for example the Commission's historical monitoring data or benchmarking.
- It is very difficult, if not impossible, for Optus to provide comment on Telstra's fibre transmission network as Optus is not privy to such information.
- The model does not appear to adequately account for tail-end transmission.
- The model 'forces' the use of fibre links however microwave technology should still be considered a legitimate lower cost technology choice.
- The formula used to calculate the WACC is potentially confusing and should be adjusted.
- The proposed transmission cost model is not yet suitable for modelling the TSLRIC of providing transmission services within Australia.

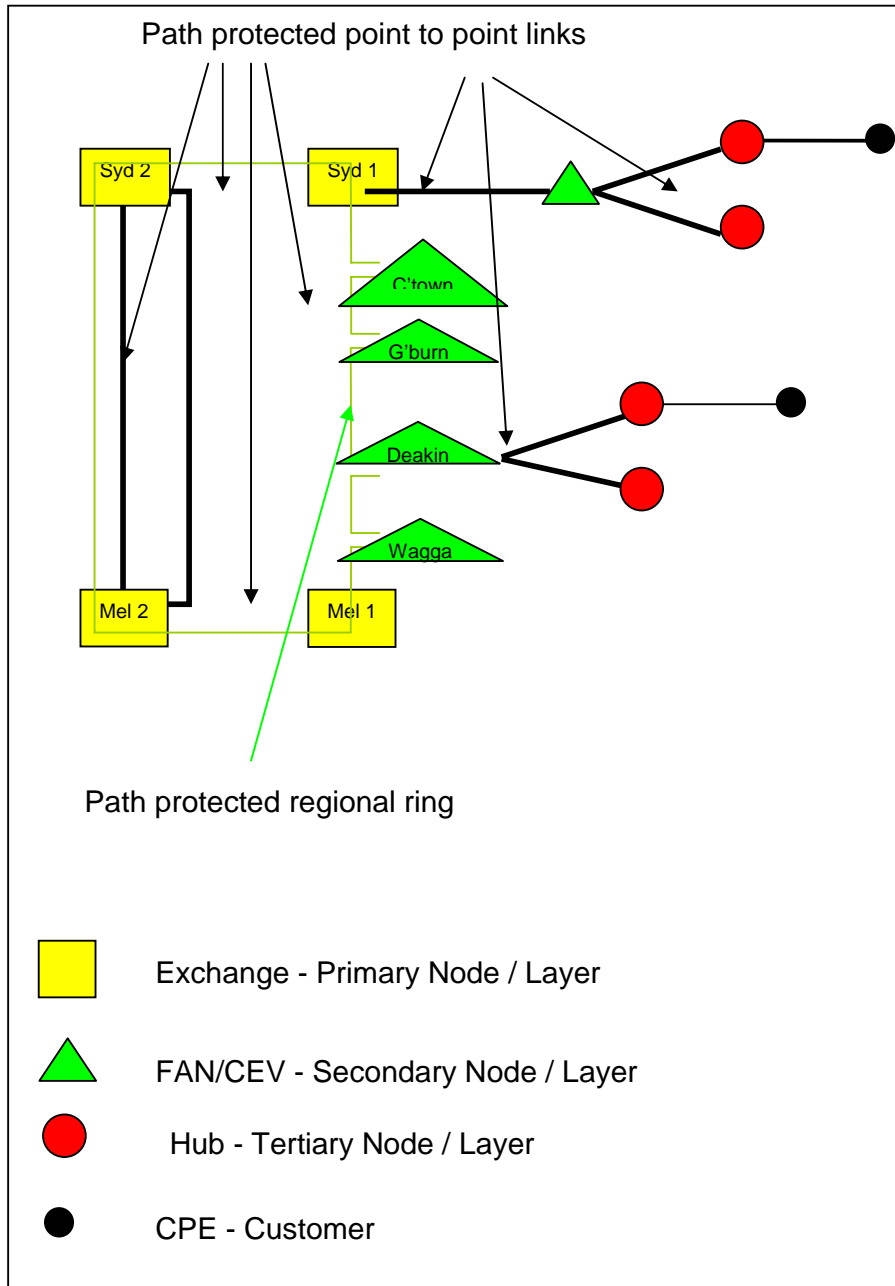
Architecture of the routes

- Do you agree with the architecture of the routes that are proposed to be modelled? If not, why not?
- Do you agree that the model allows for the appropriate transmission elements and services to be modelled? If not, why not?
- Do you consider the transmission between capital cities and regional centres should be modelled based on Telstra's current network architecture? If not, why not?
- In your opinion, to what extent will the cost of transmission differ on a particular route depending on the available bandwidth that is offered to an access seeker?

Ring and point to point architectures

- 3.2 Optus submits that the architecture of the routes, particularly the ‘ring’ structure used, is not appropriate. Typically a large transmission network will be made up of both ‘ring’ and ‘point to point’ systems (refer to figure 1). The balance between ring and point to point will depend upon the maturity of the network and the density of services along a route. Typically within any ring structure transmission capacity will be mapped as logical point to point configurations between the gateway element and the access elements.
- 3.3 The network architecture is best described by the following examples:
- (a) Optus has point to point routes, both inter and intra-state, between major exchanges that are commonly referred to as express routes. These routes are high capacity (2.5Gbs or 10Gbs) with high utilisation (greater 80 per cent) and no intermediary add/drop points between the end points. The actual physical optical cable path may be arranged on a loop to provide path diversity. Typically there are no intermediary add/drop points between the end points.
 - (b) Optus uses ring topology to connect multiple regional sites along a route. These routes may be inter or intra state routes. Typically the bandwidth available in the ring is distributed between nodes and mapped as logical point to point configuration. Ring topology is employed at start up to minimise capital expenditure and increase utilisation levels.
- 3.4 Optus submits that the majority of current transmission network architecture is based upon physical point-to-point structures. The basic philosophy behind a point-to-point network being that the network can be upgraded, rearranged or altered in a way which minimises the impact on other customers connected to the network.

Figure 1 – Schematic Diagram of Optus Transmission Network



3.5 Optus submits that ring topology is not the most efficient topology for high density routes. Ring topology has a number of draw backs including:

- It is known to compromise service level agreements (SLAs) as it is very difficult to arrange an outage on one node with out downgrading service at all other nodes;
- Managing available and allocated bandwidth within the ring is complicated, time consuming and error prone; and

- Increasing the transmission rate in one section of the ring requires all section to be upgraded to the same level, regardless of whether the other links require (demand) the increased capacity or not.

Tai-end transmission

- 3.6 Optus submits that the model does not appear to adequately account for tail-end transmission.
- 3.7 The model classifies transmission links under the following classifications - ‘link’, ‘inter-exchange’ and ‘tail’.⁵ However Optus believes that a tail connection generally represents the ‘last mile’ of the network, connecting for example a local exchange (or POI) and customer. In contrast, the model defines this connection as one between a transmission hub and a local exchange (TEBA space), both of which could be co-located. Therefore based on figure 1 in the Commission’s transmission model it should be referred to as a “link”.
- 3.8 The model does not allow for transmission leases between the local exchange and the end customers premises. That is, that part of the network which is typically referred to as the Customer Access Network (CAN). These tails are an important element in Optus’ and other carrier’s transmission networks. Optus uses such leases to connect customers to the nearest Optus transmission hub in areas where Optus does not have suitable infrastructure. For example customers outside of the Optus fibre and DSL foot print.

Choice of technology

- 3.9 The model assumes the use of fibre links however Optus submits that microwave technology should still be considered a legitimate technology choice.
- 3.10 In the 2003 review of the service’s declaration, Optus and other carriers submitted on the value of microwave links. The Commission noted these concerns, although still considered fibre to be the “dominant technology”.⁶ It was on this basis that Gibson Quai-AAS provisioned the transmission model exclusively with fibre links.
- 3.11 Optus contends that microwave is still an important technology and viable transmission medium. Microwave links provide the same service quality and are suitable in a variety of situations where fibre links may not be economically viable. Key considerations for a carrier when determining a technology choice for a transmission link include:
- The topography between end points or drop of points;
 - The distance between nodal points;
 - Access ability to proposed route;
 - Heritage and environmental issue along proposed routes;

⁵ ACCC (2007), *Transmission network cost model – discussion paper*, May 2007, page 12.

⁶ ACCC (2004), *Review of the declaration of the domestic transmission capacity service*, Final Report, April 2004, page 19.

- Population density along proposed route and at near nodal points; and
 - Transmission capacity required (short, medium and long term).
- 3.12 Deployment costs are sensitive to the location and geography of the landscape, particularly the type of terrain and ease of access. It is significantly more costly for carriers to build networks in remote regions as equipment and personnel must be transported to the location.
- 3.13 Rugged or densely vegetated terrain will add to deployment costs. Although sites may be located relatively close together, the most direct fibre-based route may not be feasible if it covers sensitive sites (e.g. protected lands), forcing the carrier to use a longer, and more costly, route.
- 3.14 In regions that are likely to have low service demand (e.g. rural and regional areas), transmission facilities with relatively small and limited bandwidth (as compared to fibre) may be appropriate.
- 3.15 Due to a combination of these issues, Optus and other carriers (including Telstra) use a significant amount of microwave technology, particularly in the mobile network for connecting base stations to the network.
- 3.16 Optus submits that due to such influences, in certain situations, the use of fibre (either owned or leased) is not economically justified and a microwave link may be the most efficient (least cost) technology choice.

Input parameters and result sheet

- Do you think that the specified mark-ups listed in Figure 3 are appropriate in a model used to estimate the costs of supplying transmission capacity services? Why or why not?
 - In your opinion, what is the appropriate magnitude of any mark-ups for the purpose of estimating transmission costs? What evidence is there to support these magnitudes?
 - In your opinion, what is the appropriate WACC value to apply when estimating the costs of providing transmission capacity services? To what extent can the WACC value be benchmarked against those applied for the provision of PSTN services? To what extent (if at all) should a different WACC estimate be used to estimate the costs of providing transmission capacity services on different capital regional routes?
- 3.17 Optus submits that it requires further information and clarification from the Commission for it to provide detailed comment on the reasonableness of values in Figure 3. It is Optus’ experience that the value of O&M and capital variables can vary significantly depending upon how they are derived. For example a key issue that requires clarification is whether the markups are incremental (network only) or fully allocated. Therefore, while providing the following comments, with greater information Optus would be able to provide further and more detailed submissions in this regard.
- 3.18 Optus also notes that the transmission cost model is highly sensitive to changes in these figures because the markups act as ‘multipliers’ for the costs calculated in lower layers of the model. It is therefore very important that the

Commission provides and seeks further discussion on this element of the model.

Markup on Capital Costs

- 3.19 Optus does not understand the basis on which the parameter 'spares' has been calculated and apportioned a value of 5 per cent. Optus requires further details on what this value actually represents. For example, does it represent a percentage of equipment capital cost or a percentage of the total deployment cost including installation and equipment? If it is simple installation costs only (i.e. a contractor installing cable and no equipment) then Optus would consider it a significant overestimate. Alternatively, if the value does include variables such as planning, development, design and installation then it may underestimate the true cost.
- 3.20 Optus does not understand the basis on which the parameter 'undersea cable installation' has been calculated and apportioned a value of 100 per cent and submits that the Commission needs to provide clarification of such details.
- 3.21 Optus also does not understand the basis on which the parameter 'indirect' has been calculated and apportioned a value of 5 per cent, or what is covered by indirect costs.

Markup on O&M Costs

- 3.22 Optus requires further clarification on the parameters 'trench and conduit' 'optical fibre' and 'transmission technology' and how the assigned parameters have been calculated and apportioned a value. Optus request that the Commission provide clarification of such details.

Indirect O&M Cost Markup

- 3.23 Optus does not understand the basis on which the parameter 'all O&M items' has been calculated and apportioned a value of 25 per cent and submits that the Commission needs to provide clarification of such details. For example it is not clear why this is an addition to the O&M items above.

WACC parameters panel

- 3.24 The WACC parameters panel includes a number of key variables that allow the user to calculate an appropriate return on capital for investment in the transmission network.
- 3.25 Optus notes that the WACC formula contained in the model is potentially confusing.
- 3.26 In principle, Optus agrees with the Commission that it may be appropriate for some parameters in the transmission service's WACC to be aligned with that used in the PSTN model. The transmission network and PSTN appear to be similar in that they essentially represent monopoly services with a single carrier (Telstra) controlling significant elements in both networks. To provide further comment Optus requires information on the precise variables the Commission propose to use in this model.

Risk-free rate

- 3.27 Optus has given some preliminary consideration to the calculation of the risk-free rate. Optus believes that the Commission should reconsider its use of a 10 year Government bond rate as the risk free rate for the purpose of estimating the cost of debt capital. Optus believes a reasonable alternative for the Commission to consider is to match the maturity of the debt instrument with the regulatory period.
- 3.28 If longer term rates are used to match the useful life of the asset (and there is an upward sloping yield curve) then the allowed cost of debt will compensate the access provider for risk that it is not taking. For example, the yield curve may be upward sloping because either the issuer may be expecting rates to rise, or it may simply be recognising the risk over the longer period. When regulation occurs in the next period, the access provider will be able to reset prices based on the new rates. If rates do actually rise during that first period then the provider will gain. Optus therefore considers that using a bond for a period longer than the regulatory period potentially allow access providers to be over-compensated (or under-compensate if yield curves are downward sloping).
- 3.29 Optus believes that the ACCC should continue to use a longer bond maturity in setting the MRP. The relevant period for this purpose would be one that is consistent with that used in the empirical studies used to estimate the MRP. Optus does not consider the GasNet case to be a relevant precedent for telecommunications regulation. This is because the Australian Competition Tribunal was critical that the Commission did not use a method that was consistent with the regulatory framework provided by the 'Gas Code'. In this decision the Tribunal decided that "the ACCC erred in concluding that it was open to it to apply the CAPM in other than the conventional way to produce an outcome which it believed better achieved the objectives [of the Gas Code]".⁷
- 3.30 Optus notes that the Code directs the ACCC to use a CAPM that "reflects standard industry structures for a going concern and best practice"⁸. GasNet were successfully able to argue that the use of different risk-free rates in the CAPM was not 'standard' practice. However the GasNet decision is not relevant to this review or telecommunications regulations generally. Optus submits that in the context of telecommunications and Part XIC of the *Trade Practices Act 1974*, the Commission has the flexibility to choose the method of calculation it finds most appropriate.
- 3.31 Optus submits that in calculating the risk-free rate, the Commission should average Government bond rates for the at least 10 days leading up to the start of the regulatory periods. The Commission has used this methodology for many years and Optus believes it is suitably robust to address any potential concerns regarding day-to-day market volatility.⁹
- 3.32 Optus notes that Telstra has previously submitted that the method of calculation should be adjusted, removing the 10 day averaging requirement.¹⁰

⁷ Australian Competition Tribunal, Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT, paragraph 47.

⁸ *National Third Party Access Code for Natural Gas Pipeline Systems*, November 1997, page 50.

⁹ The ACCC first proposed and used this method in 1999 in regards to Telstra's PSTN Undertaking.

¹⁰ Bowman R. G. (2005), *Report on the Appropriate Weighted Average cost of Capital for the ULLS Network*, December 2005, page 10.

Optus continues to support the Commission's position that there is sufficient liquidity in the Australian bond market to justify the continued use of the averaging approach.¹¹

Beta

- 3.33 Optus submits that in calculating beta the Commission should use a variety of methods, including direct empirical estimation and benchmarking. This approach is consistent with past regulatory determinations in regards to the PSTN and ULLS. Optus notes that in a recent determination regarding electricity transmission, the estimated equity beta was in the range of 0.78 to 1.11.¹² Optus believes the Commission should give consideration to the relevance of these as benchmarks for the purposes of estimating the equity beta in this context.

Market risk premium (MRP)

- 3.34 Optus submits that, at least for consistency, given the Commission's previous representations on the size of the market risk premium (MRP) the transmission network cost model should also use a value of 6 per cent.

- 3.35 Since the assessment of Telstra's 1997 PSTN undertaking, including decisions in other industries, the Commission has determined that the appropriate MRP for a regulatory WACC is 6 per cent. Further, most recently, in the ACCC's Final Decision on Telstra's ULLS Undertaking, the Commission specifically rejected a MRP of 7 per cent:

*"The ACCC considers that it is not satisfied that an MRP of 7 per cent is an appropriate input into the WACC. The ACCC considers that the MRP for Australia is 6 per cent."*¹³

- 3.36 Optus considers the issue of the MRP has been given adequate consideration in previous regulatory proceedings.

Non-interest bearing debt

- 3.37 Optus notes that the recommended WACC allows for non-interest bearing debt in the weighted average cost of capital formulation. Optus is concerned that this inclusion may be an error. Optus considers that non-interest bearing debt is not a relevant source of capital beyond capital which is used for short term purposes. Rather, this is likely to be working capital resulting from the timing of accounts and would likely be sourced from equity capital.

Weighting

- 3.38 Optus notes that the weighting of equity and debt capital in the model appears to be in the proportion 80:20. Optus considers a debt ratio of 20 per cent to be

¹¹ ACCC (2006), *Assessment of Telstra's ULLS monthly charge undertaking*, Final Decision (Public version), August 2006, page 104.

¹² IPART (2004), *NSW Electricity Distribution Pricing 2004/05 to 2008/09*, Final Report, June 2004, page 219.

¹³ ACCC (2006), *Assessment of Telstra's ULLS monthly charge undertaking*, Final Decision (Public version), August 2006, page 118.

extremely low. Optus also considers the Commission's approach of using a debt ratio of 40 per cent to be low. Optus believes the Commission should also reconsider the relevance of Telstra's book gearing. Optus considers this might only be relevant if the cost of capital were to be applied to the book value of Telstra's assets. Optus submits that given the cost of capital to be applied is the level of 'efficient' costs from the perspective of a forward looking model, the Commission should use an 'optimal' debt ratio which, for this type of asset, Optus believes may be more in the order of 60 per cent.

Tax

- 3.39 Optus is also concerned with other aspects of the treatment of tax, and it is somewhat unclear as to whether it is intended for there to be a post tax WACC with separate modelling of the tax burden. Optus generally considers it appropriate to model the tax burden separately (given its complexities) rather than use a formula to 'gross up' the WACC. The WACC used appears to be a post-tax WACC which, in principle, Optus does not oppose. However, there are aspects of the calculation that require much further consideration.

Route Design sheet

- Are the parameters specified to model the cost of transmission on a 'interexchange' route appropriate? If not, why?
 - Are the parameters specified to model the cost of transmission on a 'link' route appropriate? If not, why?
 - Are the parameters specified to model the cost of transmission on a 'tail-end' transmission route appropriate? If not, why?
 - Are the parameters specified to model the cost of transmission on a 'submarine route' appropriate? If not, why?
 - Are the additional parameters specified to incorporate the 'additional length of optical fibre into each exchange', the 'optical fibres in exchange cable lead in' and the 'optical fibre cable joints' appropriate? If not, why?
- 3.40 Optus consider the 'route design sheet' to be inappropriate as it does not model the network architecture correctly. Optus reiterates that that the overall architecture of the routes used in the model, particularly the ring structure, are not appropriate and rather the network model should be based upon combination of point-to-point and ring based links.
- 3.41 Given that Optus does not agree with the fundamental structure of the model it will not provide further comment, at this time, on the specific parameters used to provision such a route design.

Technology Selection

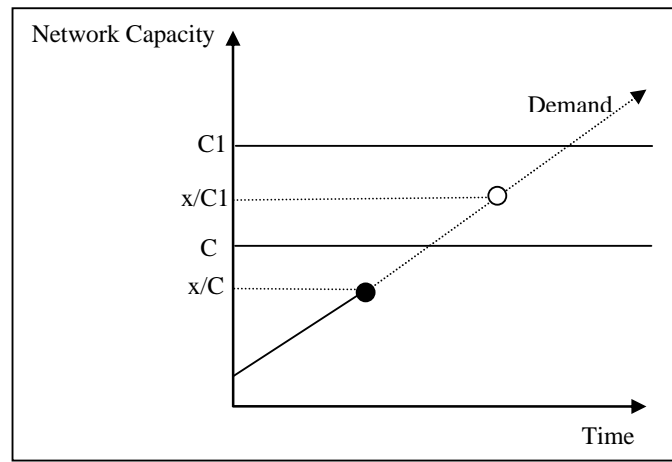
- Do you agree with the technology choices available in the model? If not, what is the 'best-in-use' technology?
- Are the assumptions in Technology selection sheet of the model reasonable?

- Are the parameters specified in the Technology selection sheet appropriate? If not, why?
- 3.42 Optus does not agree with the choice of SDH technology exclusively and submits that second generation SDH and xWDM systems are more commonly used in modern transmission networks as they are a more advanced and efficient technology.
- 3.43 Optus believes that the general methodology (in terms of relationships between parameters) applied in the technology section worksheet are appropriate.

Transmission Demand Estimates

- Does the methodology employed in the Demand estimates sheet provide reliable and reasonable estimates of capacity demand?
 - Are the assumptions in Demand estimates sheet of the model reasonable?
 - Does the Demand estimates sheet assist with the selection of parameters which are consistent with an efficient network design?
- 3.44 Optus does not fully follow the role of the transmission demand worksheet in the model. Further, Optus believes that the calculations in the spreadsheet are confusing and over-simplify reality to produce the demand function.
- 3.45 Optus submits that it is not appropriate to use such a forecasting system as carriers provision capacity and network architecture based on actual demand and the level utilisation in the network. Figure 2 illustrates how Optus adjusts its network capacity to meet actual demand. Initially the transmission network is provisioned to handle a maximum capacity (demand) of C. However Optus increases network capacity once actual demand reaches a threshold point below the maximum. This point is a proportion, x, of the total capacity. Once this occurs Optus will adjust its network, increasing capacity to a higher level of C1, creating a new threshold of x/C1. In this way it can be seen that Optus does not forecast demand, rather it adjusts the network to meet the level of actual network utilisation allowing sufficient spare capacity to expand the network capability.

Figure 2 – Example of adjusting Network Capacity and Utilisation over time



Annualised Cost Calculation

- To what extent are the initial investment costs for each network item a reasonable approximation of actual price trends?
 - To what extent are the price trends assumed for each network item a reasonable approximation of actual price trends?
 - To what extent are the price trends assumed for each network item a reasonable approximation of actual price trends?
 - Is the conversion factor used to convert the ‘total cost’ of network items into an annualised cost into a ‘year 0’ tilted annuity value appropriate?
 - Is it reasonable that the model should estimate costs for year 0 in a tilted annuity?
- 3.46 Optus believes that the general methodology of applying a tilted annuity is appropriate but has concerns as to whether the application is correct.

Accommodation Cost Estimates

- Are the assumptions in the Accommodation cost estimates sheet of the model reasonable?
 - Does the methodology employed in the Accommodation cost estimates sheet provide reliable and reasonable estimates of accommodation costs?
- 3.47 Optus believes that the general methodology (in terms of relationships between parameters) applied in the worksheet appear to be appropriate, however Optus does not understand the basis on which the parameters have been calculated, and submits that the Commission needs to provide clarification of such details.

Trench and Optical Fibre Calculation

- Are the assumptions in the Trench and Optical Fibre Cable sheet of the model reasonable?
 - Do you consider distance to be the major driver of trench and optical fibre cable costs?
 - Are the calculations performed to estimate Trench and Optical Fibre costs appropriate?
- 3.48 Optus submits that for it to determine whether parameters in the worksheet are appropriate would require further information such as the network architecture and distances involved. The Commission needs to provide clarification of such details.

Inter-exchange, link, tail and submarine model sheets

- Does the methodology employed in the inter-exchange, link, tail and submarine model sheets provide reliable and reasonable estimates of transmission costs?
- 3.49 Optus again submits that the model does not adequately account for tail-end transmission. Optus believes that a tail connection generally represents the 'last mile' of the network, connecting for example a local exchange (or POI) and customer. In contrast, the model defines this connection as one between a transmission hub and a local exchange (TEBA space), both of which could be co-located.