TELSTRA CORPORATION LIMITED

Response to the Commission's Issues Paper (a second discussion paper) into the public inquiry to make a final access determination for the wholesale ADSL service:

Pricing to Improve Customer Experience

Public version

24 August 2012

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Introduction

Telstra's aim is to compete by providing the best quality of service for our retail and wholesale ADSL ("**WDSL**") customers at the best value price.

In such a dynamic and changing marketplace, this can be a challenge. Our customers are living increasingly connected lives, consuming a growing range of online content and intelligent applications, and demanding more complex services that require faster and larger networks. They are using more and more data every year.

Ensuring that this (now business as usual) growth does not reduce the quality enjoyed by our customers is an ongoing challenge and requires a careful mix of the right investment incentives, clever engineering, and setting the right price signals.

In declaring WDSL, the ACCC can now set investment incentives and price signals, and hence manage two thirds of the equation that governs the experience and value for money to our customers. As such, the implications of regulatory interventions in this process are significant for all end users.

In this submission, we will:

- Describe the state of competition and congestion in ADSL markets and in that context;
- Discuss what promotes the long term interests of end users; and,
- Identify those pricing outcomes that would best promote and those that would most harm end users' interests.

We consider that the pricing principle that would best promote the long-term interests of end users is one that results in no substantial worsening of experience for our retail and wholesale ADSL customers relative to current levels. That is a difficult objective to meet given:

- Customer traffic on our ADSL network is increasing at over [c-i-c commences] [redacted] [c-i-c ends] per annum;
- [c-i-c commences] [redacted]
- [redacted] [c-i-c ends]; and,
- Congestion is an industry issue.

The state of competition and congestion in ADSL markets

Internet Service Providers (ISPs) supply retail ADSL services to their customers using a variety of underlying technologies and wholesale services. There are 'resellers' that buy layer 2 wholesale ADSL (WDSL) services, and 'ULLS/LSS builders' that buy line sharing services ("**LSS**") and unbundled local loop services ("**ULLS**") combined with their own transmission and electronic infrastructure. The builders are vertically-integrated suppliers who, in many cases, also supply resellers with WDSL services.

Competition

The state of competition in ADSL markets is discussed in Telstra's Non-Price Submission.[1] Competition varies by geography. Telstra has identified 289 Exchange Service Areas (ESAs) which are particularly competitive. In those 289 ESAs, Telstra faces competition in the supply of retail and wholesale ADSL services from at least Optus, iiNet and TPG. Of all the ADSL services supplied in Australia, [c-i-c commences] [redacted][c-i-c ends] are supplied in these 289 competitive ESAs. As at June 2012, there were another [c-i-c commences] [redacted][c-i-c ends] that have at least one ULLS/LSS builder. [c-i-c commences] [redacted][c-i-c ends] of all ADSL lines in Australia are supplied in these ESAs. In the remaining mostly rural ESAs, Telstra is the only supplier of ADSL services. [c-i-c commences] [redacted][c-i-c ends] of all ADSL lines are supplied in these ESAs.

For the remainder of this submission, we distinguish between the 289 ESAs where there is intense competition and the remainder of the ESAs where there is, in some cases, competition, but it is unlikely to be at the same level observed in the 289 ESAs.

Congestion

WDSL networks are congestible networks

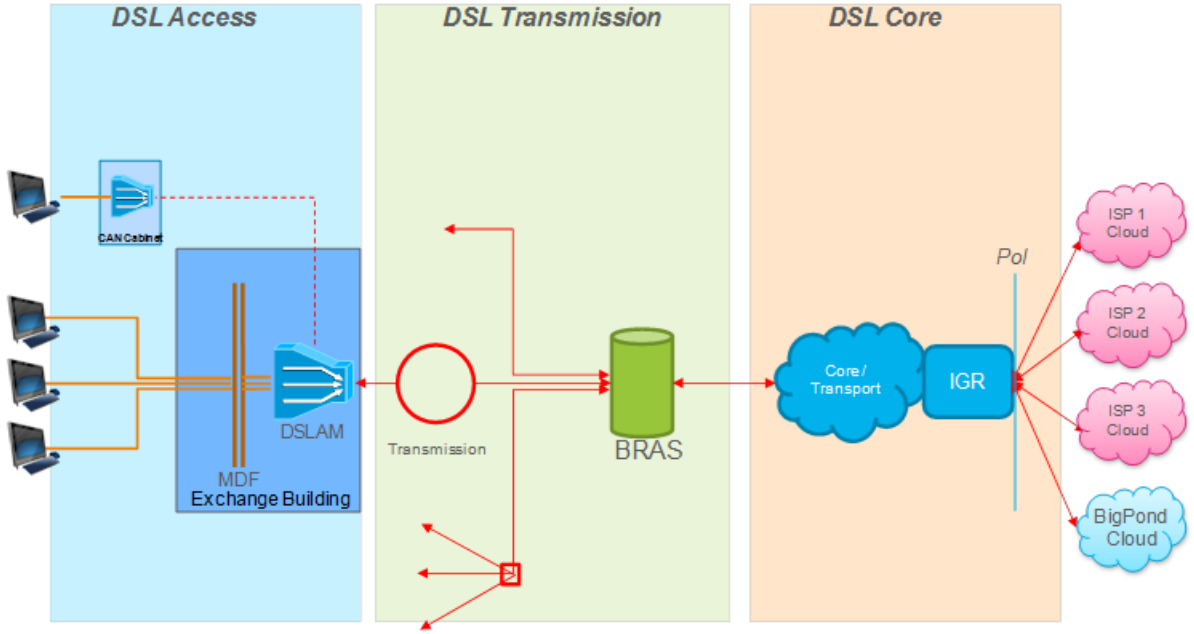
WDSL services are supplied over a network that connects customers from their premises to one of Telstra's exchange buildings using Telstra's copper customer access network ("**CAN**"), and from Telstra's exchange buildings to one of Telstra's points of interconnect ("**PoI**") with wholesale customers, using Telstra's transmission and core networks.[2] The figure below depicts one of the multiple configurations used to supply WDSL services. We note that Telstra's network is comprised of multiple different technologies and configurations,[3] so this diagram does not necessarily depict all situations.

[1] Telstra Corporation Limited, Response to the Commission's Issues Paper (a second discussion paper) into the public inquiry to make a final access determination for the wholesale ADSL service, 24 August 2012 – Non-price terms, Chapter 2.

[2] Statement of [c-i-c commences] [redacted][c-i-c ends], fig. 3.

[3] Statement of [c-i-c commences] [redacted][c-i-c ends], section C2.

Figure 1: Stylised representation of Telstra's DSL network, highlighting different network elements



Source: Statement of David John Piltz, fig. 3.

Each network element between customers' premises and the PoI will have certain capacity constraints or other characteristics that determine the customer experience. For instance:

- The DSLAM will have a given capacity of ports (customers) and, depending on the technology, a throughput capacity (for example, some DSLAMs can only permit 8mbps while others allow up to 24mbps);[4]
- The transmission elements that make up the links between the DSLAM and the POI have different capacities, and when demand exceeds supply, the throughput allowed for each customer will be reduced; [5]
- The electronic equipment (BRAS and IGR) used in the transmission network have certain capacity constraints;[6] and,
- The amount of aggregating virtual circuit (AGVC) capacity bought by wholesale customers also represents a certain capacity constraint.[7]

This means that should demand exceed supply at any of these points on the network, customers' traffic will be rationed, which typically results in lower throughput and worsened customer experience.

In Telstra's experience, and this will be the same for all industry suppliers, the network elements that most frequently have higher occupancy and congestion are the transmission network elements closest to the DSLAMs. This is for a number of reasons, including that ADSL networks are geographically widely-distributed and hence network elements closest to customers tend to be relatively small and can be more

[4] Statement of [c-i-c commences] [redacted] [c-i-c ends] paras 12(b) and 25.
[5] Statement of [c-i-c commences] [redacted] [c-i-c ends] paras 44-48.
[6] Statement of [c-i-c commences] [redacted] [c-i-c ends], paras 35-43.
[7] Statement of [c-i-c commences] [redacted] [c-i-c ends], para. 42.

susceptible to the "bursty" nature of traffic.[8] Telstra has over [c-i-c commences] [redacted] [c-i-c ends] DSLAMs in its ADSL network.[9]

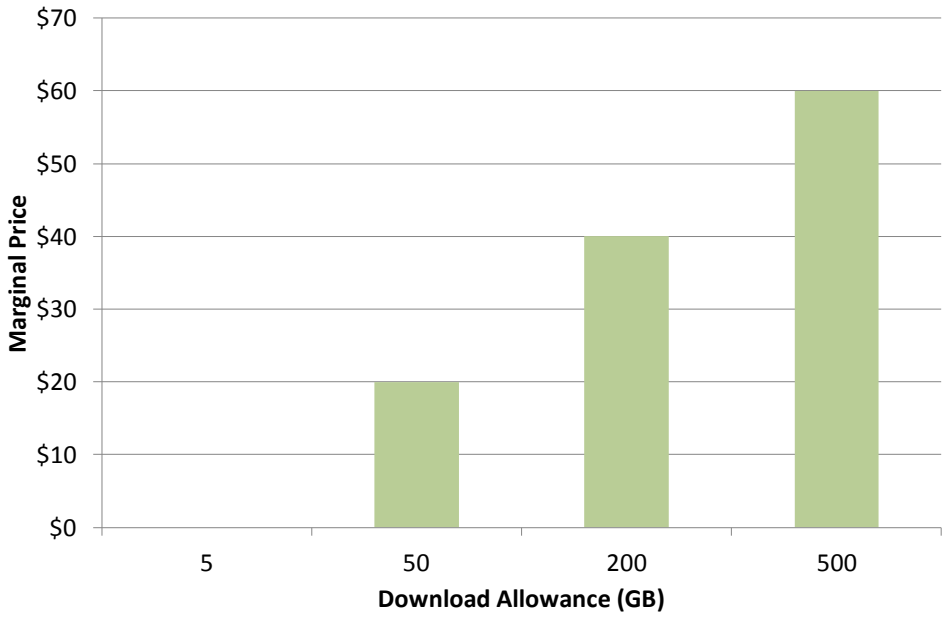
Telstra goes to great lengths to manage its network so as to ensure a great customer experience

Generally, there are three instruments at Telstra's disposal to manage congestion.

First, Telstra invests heavily to expand the capacity of network elements. Since January 2008, Telstra has invested [c-i-c commences] [redacted] [c-i-c ends] in its ADSL network. [c-i-c commences] [redacted] [c-i-c ends] of this investment was in transmission, [c-i-c commences] [redacted] [c-i-c ends] in DSL access and [c-i-c commences] [redacted] [c-i-c ends] in its core network. Telstra expects that investment in our ADSL networks will continue to support customer experience until customers are transferred from Telstra's copper network to the NBN. However, given Telstra's duty to shareholders, the extent of these investments depends critically on the returns that Telstra can expect from those investments, relative to other investments, over the period truncated by the NBN migration.

Second, Telstra sets its retail prices with a structure and level that assists the management of congestion. Retail customers face a choice as to how much data they want to pay for each month. The more data included in the plan, the more expensive it is. As illustrated in the figure below, for a customer on a 5GB plan, the incremental cost of more usage is between $20 and $60. Should a customer exceed its data allowance on a Telstra plan, the customer's throughput is reduced until the next billing period or until the customer upgrades his or her plan, if they choose to do so.[redacted]

Figure 2: The marginal price of Telstra's current retail ADSL prices relative to Telstra's 5GB plan



Source: http://www.telstra.com.au/internet/home-broadband-bigpond-elite-plans/

[8] Telstra Corporation Limited, Response to the Commission's Issues Paper (a second discussion paper) into the public inquiry to make a final access determination for the wholesale ADSL service, 24 August 2012 – Non-price terms,, section 5.3, box 1.

[9] Statement of [c-i-c commences] [redacted] [c-i-c ends], para. 27.

[c-i-c commences]

[redacted]

[redacted] [c-i-c ends]

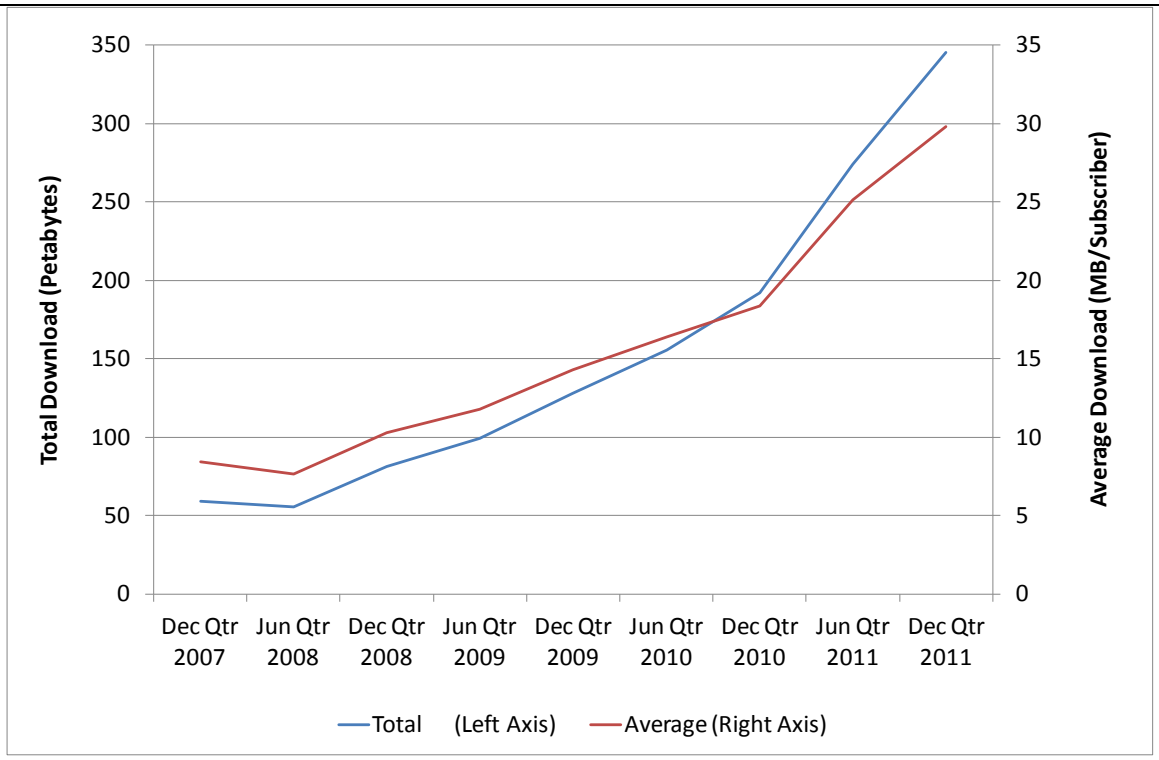
[c-i-c commences] [redacted]

[redacted]

[redacted] [c-i-c ends]

A similar trend is observed from an industry perspective. The figure below illustrates data from the Australian Bureau of Statistics (ABS) as to the amount of data downloaded (over all access technologies including ADSL) by customers of all ISPs with more than 1000 customers.

Figure 4: Industry growth of ISP traffic



Source: ABS, Internet Activity, Australia, Dec 2011

Telstra forecasts this growth to continue as more applications and devices become available that enable the streaming of movies, sport and other entertainment, as well as allowing more data-intensive applications for better shopping experiences and online interaction with businesses around Australia.

Part of the reason for this growth is the change in the composition of traffic shifting over the last three years. In 2009, [c-i-c commences] [redacted] [c-i-c ends] of the traffic on Telstra's network was used for real-time entertainment, for example, streamed video content. By 2012, real-time entertainment traffic has grown to [c-i-c commences] [redacted] [c-i-c ends] of the total traffic composition. This strong growth is driven by customers demanding video applications[10] – notably YouTube as well as services available directly from television sets and devices such as Telstra's T-Box, Microsoft's X-box, Sony's Playstation, and Apple TV, etc. More generally, growth has also been driven by websites and applications relying much more heavily on rich media and, therefore, becoming much more data and traffic intensive.

[10] Statement of [c-i-c commences] [redacted] [c-i-c ends], para. 66.

[c-i-c commences] [redacted]

[redacted]

[redacted] [c-i-c ends]

As illustrated in the figure below, the peak time on Telstra's network occurs relatively consistently. During these times, customers most want to use their ADSL connections for the variety of uses they demand.

[c-i-c commences] [redacted]

[redacted]

[redacted] [c-i-c ends]

Congestion is an industry issue

Both retail and wholesale ADSL customers would be affected by congestion on Telstra's ADSL network where it occurs. The network is a shared network, with wholesale and retail traffic carried from the DSLAM to its associated BRAS and IGR on common transmission infrastructure.[11] **[c-i-c commences]** [redacted] [c-i-c ends] **When congestion does occur, it worsens customer experience**

In the unfortunate circumstance when congestion does occur, it materialises for customers in:

- Delays in downloading and interacting with websites resulting in media-rich websites becoming less useful for customers;
- Streamed video becomes pixelated, pauses or requires significant delay before the content becomes available;
- Traffic-intensive devices (for example, internet-connected televisions and set-top boxes) are either not made available for customers on congested parts of the network or, if they are, they might not meet their intended performance; and
- Australian businesses that rely on being online with traffic-intensive applications suffer from smaller addressable markets and lost sales.

To consider this from an economics perspective, these outcomes result in lower social welfare.

A recent study illustrates the possible impact on customers.[12] The study investigated the extent to which customers in the United States (US) were willing to pay for higher Internet speeds, or to avoid lower speeds. The study was prepared in 2010 for the Federal Communication Commission's National Broadband Report to US Congress. The authors estimate that customers are willing to pay as much as US$45/month to improve the speed of an Internet plan from the equivalent of dial-up speeds (which can be likened to a service provided on a network suffering congestion) to a speed suitable for streaming music, photo sharing, and watching videos. Customers are willing to pay $48/month to improve speeds from dial-up to speeds suitable for gaming, watching high-definition movies and instantly transferring large files (which can be likened to a service without congestion).

While this study was conducted in US markets, it helps to put congestion economics into perspective. Congestion could cost customers US$48/month each in surplus. If congestion is caused because the prices they pay for the service are lower than what would be necessary to avoid congestion, customers, and perhaps even society, will be worse off.

Competition and congestion

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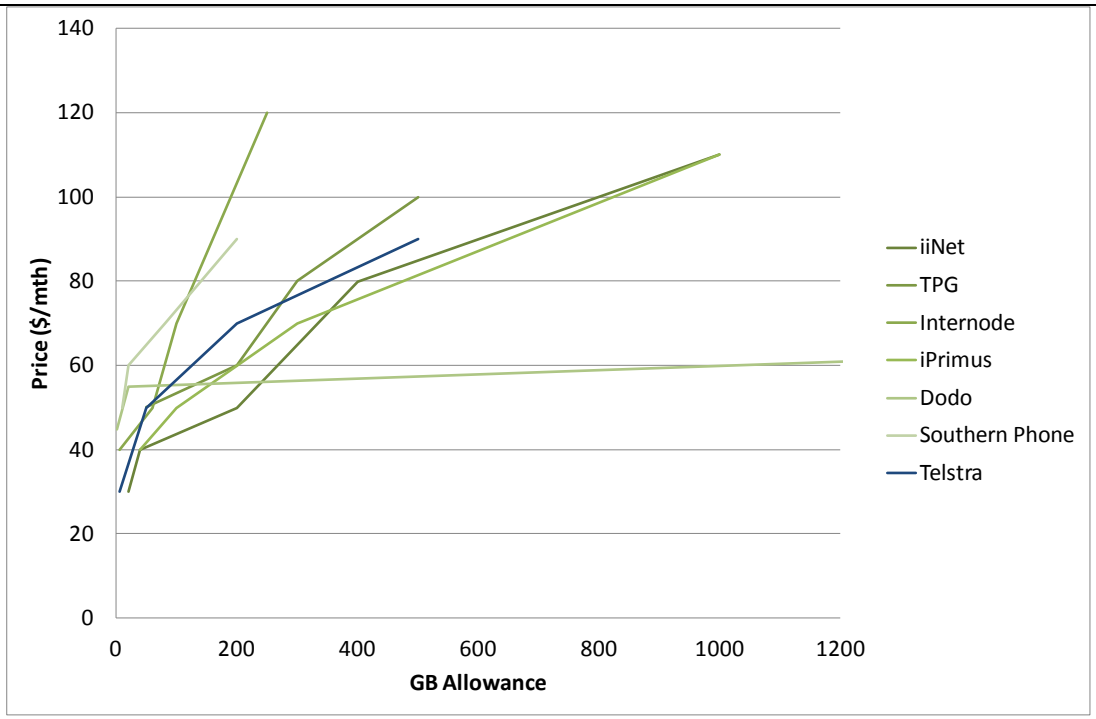
[11] Statement of [c-i-c commences] [redacted] [c-i-c ends], para. 48.
[12] Rosston, G., Savage, S. J. and Waldman, D. (2010), *Household Demand for Broadband Internet Service: Final report to the Broadband.gov Task Force Federal Communications Commission*, 3 February 2010.

While increasing competition from ULLS/LSS builders over the last five years has reduced the number of customers that may have otherwise been served by Telstra's network, this has been thoroughly outweighed by the growth in traffic demanded from those customers remaining on Telstra's network.

Telstra and its competitors have been using price to manage congestion. Generally, customers who purchase low amounts of usage face an incremental cost to increase their consumption of metered data. With respect to traffic-intensive unmetered content, such as video, there is an additional charge to customers. Charges to download a movie or an additional subscription fee for Foxtel send a price signal to customers who increase traffic on the network and are instruments in the management of congestion. Similar structures exist for Telstra's competitors, as illustrated in the figure below.

Figure 7: Telstra's prices vs. competitors' off-net prices



Source: Off-net prices from company websites

Telstra's competitors also experiment with peak-load pricing policies – that is, setting different download allowances depending on whether the customer is using the network at peak times or not. The effect of these policies is unknown.

ADSL pricing and the long-term interests of end users

When determining the price for ADSL, it is ultimately the statutory criteria that guide the ACCC's decision. When applying the statutory criteria, an almost-universal precedent has developed since the criteria were first enacted, whereby they have been assessed as economic criteria. Indeed, in many previous determinations, the ACCC has found that cost-based pricing principles best promote the long-term interests of end users ("**LTIE**") (1997 and 2010 draft), and in making those determinations, the ACCC has implicitly or explicitly used economic theory as justification. At a very basic level, a cost-based pricing theory shows that prices are socially-optimal when they are set equal to an appropriate measure of the cost associated with the consumption of the service. Consequently, the ACCC has almost universally set

prices for regulated services equal to the Total Service Long Run Incremental Cost (TSLRIC), or recently the Historic Cost, associated with consumption of the service, albeit with different models and different measurement approaches.

However, the economics relied upon for these decisions do not universally apply to all regulated services, particularly services that are supplied on congested networks or for those supplied on a competitive basis. This section discusses the economics of congested networks and, in that context, the specific statutory criteria.

The section concludes with Telstra's view that a different approach needs to be taken by the ACCC in determining a price for WDSL and that the standard regulatory models do not promote the statutory criteria, including the LTIE.

The economics of congestible networks

On congested networks, the additional traffic caused by one user raises the utility or welfare of that user, but reduces the welfare of all other users using the same congested network. In economics, this is termed a negative externality of consumption. This externality is not considered in the traditional regulatory models applied by the ACCC, because it only exists in given circumstances, for example where there is congestion.

However, as discussed above, ADSL networks are congestible [c-i-c commences] [redacted] [c-i-c ends]. Congestion reduces welfare for customers as they gain less utility from the online services they want to consume.

What would happen if the traditional regulatory model (for example, the **FLSM**) was applied and WDSL prices were reduced? The result is sometimes referred to as the 'Tragedy of the Commons'.[13] With rational retail and wholesale customers acting in their own self-interest, reductions in prices would result in more traffic on congestible networks. Congestion would reduce the welfare that customers gain from consumption of the service, and everyone is worse off, despite the lower prices.

To achieve socially-optimal prices, the ACCC must account for the congestion externality, which is beyond the scope of the traditional regulatory model.

Relevant economics literature states that prices maximise consumer surplus when prices are set equal to the cost they impose on others in consuming the service, which is different to the cost of supplying the service. Economic theory further states that prices in competitive markets tend to be set at a level that reflects the congestion externality. Generally the reason for this is explained by existing customers preferring new customers that add congestion be provided services by another supplier. The existing customers are willing to pay higher prices for this to happen.

These are not new findings in economics,[14] nor are they findings that are infrequently applied.

MacKie-Mason and Varian apply this theory to Internet-related markets and confirm these conclusions.[15] In their expert report, Gowrisankaran and MacKie-Mason state the following:

- In standard economic models, price should optimally be set equal to costs of production.[16]

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[13] Hardin, Garrett (1968), "The Tragedy of the Commons", *Science*, vol. 162 (3859), pp. 1243–1248.
[14] See, for example, Pigou, Arthur (1920), "The Economics of Welfare" and Knight, Frank (1924), "Some Fallacies in the Interpretation of Social Cost".
[15] MacKie-Mason, J. and Varian, H. (1994), "Pricing Congestible Network Resources", *mimeo*, 11 November 1994.
[16] Expert Report of Gowrisankaran and MacKie-Mason - Efficient Pricing of ADSL Wholesale services – Report prepared for Telstra, August 2012, p. 12.

- Models with congestion, however, are unlike standard economic models: because the congestion will cause an externality if it is not priced, optimal pricing does not depend only on the costs of production. Instead, the optimal price depends on both the costs of extra production needed to offset usage and on the congestion costs imposed by the consumer on all other consumers.[17]
- An important finding of the MacKie-Mason and Varian paper is that industries with congestion will generate socially-optimal congestion prices under competition provided that the technology is such that firms can charge two-part prices to end consumers.[18]
- However, we believe that the current observed congestion prices in the Australian ADSL market do not reflect optimal congestion prices going forward and indeed are lower than the optimal prices.[19]
- Another important point about competitive markets for congestion goods is that they will both price congestion appropriately given the current capacity level, and also generate socially-optimal investment in capacity.[20]
- The lack of congestion pricing will not mean that ADSL services will fail altogether. But there are real and important economic consequences to not having appropriate congestion pricing.[21]

Congestion pricing is widely used in other infrastructure sectors to manage peak demand, including in electricity networks, roads and pollution. The Frontier Economics expert report discusses congestion economics in the context of electricity markets and the similarities and differences relative to ADSL markets.[22] While congestion is important in the context of the electricity market, there are different implications for pricing and investment. In the long run, congestion in electricity transmission lines is avoided as the line provider is encouraged to invest to avoid congestion and the blackouts that arise because of congestion. In the short-term, when congestion in transmission lines is likely to arise, more expensive alternative generators that do not rely on those lines are sourced to avoid the potential congestion. In ADSL markets, it would rarely make sense to invest so as to avoid congestion altogether. Consequently, there is likely to be some congestion that needs to be priced for a socially-optimal outcome.

Implications for the LTIE

Promoting competition

With respect to the promotion of competition, precedent has established that it is the dynamic process of competition and not individual competitors that must be promoted. The process of competition is generally recognised as complex. In this case, the process of competition is further complicated because competition occurs on the many typical dimensions, for example price, brand, marketing and geographic reach, but also on the level of congestion on competitors' networks. Some competitors might choose to compete by offering a low level of congestion, while others might choose to compete by offering a higher level of congestion counter-balanced by providing better value elsewhere (e.g. a lower price).

To promote the process of competition, particularly in areas where there are multiple networks, regulation must preserve the ability for the operators of different networks to operate at different levels of congestion and price their wholesale and retail services accordingly. Changing one dimension of the competitive process for one firm (e.g. lowering price) will have consequences on that firm's decisions in relation to

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[17] Ibid, p. 12.
[18] Ibid, p. 15.
[19] Ibid, p. 21.
[20] Ibid, p. 16.
[21] Ibid, p. 13.
[22] Expert Report of Frontier Economics – ADSL network congestion pricing and use of RMRC – Report prepared for Telstra, August 2012, pp. 3-7

other dimensions of the competitive process (e.g. raising congestion). This would also have implications for other firms and the competitive process generally, which must be taken into account.

Achieving a less-congested network will be difficult if the network owner must make available resale services at a price that does not reflect the congestion cost. The network provider cannot account for congestion in its prices alone. Customers would get a similar service (with the same amount of congestion given the network is shared) but at a lower price from resellers. The attempt to account for congestion in prices would be undermined as customers shift to resellers. At a lower price, demand and congestion will be higher.

Even in areas where there is less competition, when setting prices the regulator must have regard to the outcomes that would be likely to arise should there be independent rivalry in that market, also accounting for congestion as a dimension of competition.

Sometimes the promotion of competition criteria is assessed more narrowly than as a process, but rather with respect to the price outcomes that are observed or predicted. In this consultation, when there is congestion, if an 'outcomes' approach to assessing the LTIE criteria is adopted, then the ACCC must assess not only price outcomes but also congestion outcomes.

Efficient use of and investment in infrastructure

In the standard regulatory model applied by the ACCC, efficient use of and investment in infrastructure has been said to occur when prices are as low as they can be while still allowing the firm to recover a fair return on its efficiently-incurred investment. This standard approach does not apply to congested networks, as setting a cost-based price can result in (socially) inefficient over-use of the network. Instead, as discussed above, (socially) efficient use occurs when prices reflect the congestion cost that users impose on others. Indeed, when prices are lower, social surplus is reduced.

Mackie-Mason and Varian demonstrate the economic incentives for efficient investment in congested networks.[23] Incremental investment is efficient when the incremental cost of that investment is less than or equal to the social return from relieving that congestion or, in other words, the cost of the congestion externality. Alternatively speaking, if prices are set to be the incremental cost of investment, but the social value of investing to relieve congestion is higher, those prices would not promote efficient investment in infrastructure. Instead, to promote efficient investment in infrastructure, prices should signal the cost to customers of congestion and the value they place on relieving it.

The legitimate business interests of the carrier and the interests of persons who use the service

The legitimate business interests of the carrier extend beyond issues of cost recovery. It is legitimate, in this case, given a level of capacity, for businesses to price so as to try to minimise congestion on their network, particularly when this is in the interests of customers who would otherwise suffer from a lower quality of service. Indeed, in this case, the legitimate business interests of the supplier and persons who use the service are aligned, since all parties are better off if prices are set to maximise use of the network but are at a level that is sufficiently high so as to discourage congestion.

Conclusion

The economics underlying the standard regulatory model used by the ACCC for other services do not apply to ADSL and congestible networks more generally. Social welfare is optimised by employing a different approach, namely when prices are set to account for the value that customers place on a less-congested network. Conversely, cost-based pricing, which does not account for congestion, will harm social welfare. This necessitates a different approach to assessing the statutory criteria.

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[23] MacKie-Mason, J. and Varian, H. (1994), "Pricing Congestible Network Resources", *mimeo*, 11 November 1994.

Price terms for WDSL that promote the statutory criteria

The pricing principle used by the ACCC to determine prices for WDSL services, and ultimately the prices themselves, must promote the statutory criteria. However, the statutory criteria in ADSL markets are determined by different factors to those considered in the standard regulatory model which has applied in the past. Adding to this are the complications that the WDSL service is a complex service and ADSL markets are dynamic and structured differently in different geographic areas. In this context, there is a heightened risk that even small errors in regulatory intervention will have large, far-reaching and observable distortions to social outcomes. With this in mind, the ACCC should adopt a cautious approach to setting prices, particularly in areas where there is demonstrably no market failure. Indeed, it is within the ACCC's powers to exempt particular geographic areas from regulation.

In geographic areas where there is no exemption, the ACCC must determine terms and conditions relating to price (or a method of ascertaining a price) for WDSL services.

This section discusses various options for pricing WDSL services to promote the LTIE addressing, first, the price structure and, second, the price level. The section reaches the following conclusions:

- While changing the price structure might help manage congestion at the margin, the different price structures applied to retail prices are difficult to apply to wholesale prices and, in any case, will not resolve congestion.
- The statutory criteria would be best promoted by increasing current WDSL prices to reflect the social cost of congestion. Although some customers (particularly heavy users) may end up paying more for ADSL services, they would be paying for a less-congested network than the other two options below, and, ultimately, a better customer experience.
- Should prices be set at their current levels (using an RMRC approach), customers would pay the same price for ADSL services, but congestion would likely increase and customer experience may worsen.
- The statutory criteria would be substantially harmed should ADSL prices be set on the basis of the FLSM.

The remainder of this section discusses, first, options for the price structure of WDSL and, second, potential price levels for WDSL.

Price structure options

Generally, congestion can be managed by changing both the price structure and the price level. Different price structures might encourage customers to use a service in ways that minimise their imposition on other users, for example by shifting their usage to off-peak periods. The price level is also used as a strong signal to customers of the value of the congestion to which they contribute.

This section discusses various wholesale price structures. Further, the section discusses experiences with various retail price structures to inform what impact those structures might have in the wholesale market. The summary of this discussion is that, while adopting some of the price structure options might help manage congestion at the margin, the different price structures applied to retail prices are difficult to apply to wholesale prices and, in any case, are unlikely to resolve congestion.

1) Peak-load pricing

When traffic on a network has discernable peak and off-peak periods, such as Telstra's ADSL network, peak-load pricing strategies might aim to shift demand from peak periods to off-peak periods. They would do so by setting a relatively high price for usage in peak periods and a relatively low price in off-peak periods. Customers, therefore, face a financial incentive to use the network more frequently in off-peak periods than they might otherwise do.

[c-i-c commences]

[redacted] **[c-i-c ends]**

These are several examples of different types of traffic delivered over the ADSL network. There are other types of traffic that customers might be willing to delay to off-peak periods, given the right incentives. However, the proportion of traffic that is not real-time entertainment is a decreasing proportion of total traffic.

[c-i-c commences]

[redacted] **[c-i-c ends]**

ISPs have experimented with peak-load pricing for retail plans in the past and are likely to continue to experiment with this in the future. Presently, some ISPs use a form of peak-load pricing. Instead of charging different price points throughout the day, their monthly download/upload allowances are split into peak and off-peak periods. This is likely to only be a weak incentive for customers to shift the usage of the network into off-peak periods. Unless those ISPs' customers are consistently surpassing their allowances, there is no incentive for them to shift their usage to off-peak periods.

At the wholesale level, peak-load pricing in the form applied in retail markets is not currently possible as Telstra does not measure the volume of downloads of its wholesale customers, nor are wholesale customers' prices dependent on the volume of data consumed. Even if it were possible, the effect that this form of peak-load pricing would have on usage (given the delay-sensitive nature of traffic-intensive applications) and congestion is not likely to materially limit congestion.

A form of peak-load pricing of AGVC throughput, which is discussed in more detail below, is currently available for use with wholesale customers.

2) Throughput charge

Telstra's current standard wholesale price structure for WDSL includes a customer charge ($/SIO) and a charge for throughput capacity at the IGR ($/mbps), which is often called the AGVC or VLAN charge. **[c-i-c commences]** [redacted] **[c-i-c ends]** Therefore, even if wholesale customers faced a relatively high cost for throughput at the IGR, this may, but would not necessarily, manage demand where congestion was occurring. It might help congestion if the wholesale customers respond to higher prices for throughput at the IGR by passing the higher prices on to their retail customers to manage demand for traffic, or limiting their customers' throughput directly.

[c-i-c commences]
[redacted] **[c-i-c ends]**

Telstra expects that this pricing construct is having some impact on usage at peak times. However, if the wholesale price was to be substantially reduced, then the positive effect that this construct has on managing congestion will be eliminated.

3) Plan tiers

Most, if not all, ISPs offer a number of retail plans to customers that are differentiated on the basis of many factors, but most importantly for customers, the plans are differentiated by the amount of download/upload allowance they receive. If they exceed those allowances, customers incur excess usage charges or their throughput is shaped. Plans with more download/upload allowance are more expensive for customers. This provides a direct incentive for customers to consume less. For instance, figure 2 above illustrates the incremental outlay for a customer on one of Telstra's 5GB plans to increase their monthly allowance. More usage results in higher outlay.

The plan structure has been an important means of managing congestion. For instance, if Telstra were forced to collapse that plan structure into a single download/upload independent charge, then it is likely that congestion on the network would be much more difficult to manage. However, to some extent, Telstra has had to collapse its plan structure over time due to competition. [redacted] **[c-i-c commences]**
[redacted]

[redacted]

[redacted]

[c-i-c ends] [redacted] However, it is not likely that a plan tier structure is practical for wholesale prices. To do so would require WDSL to be layer 3 services, so that Telstra would be able to measure customer usage.

4) Additional outlays for specific, high-traffic content

In addition to their plan's monthly charges, Telstra's retail customers must also pay additional outlays for certain real-time entertainment and other high-traffic content. For example, Telstra's retail customers must pay an additional:

- $19.50/month for the Get Started Foxtel package supplied over T-Box;
- $1.99 to $6.99 for movie downloads; and
- $10-$20/month for additional sport and television packages.[24]

[c-i-c commences]

[redacted] **[c-i-c ends]**

These pricing strategies are expected to have a material effect on congestion. However, this effect is limited to Telstra content only. Telstra does not charge retail customers any additional amount for content hosted by third parties, for example, YouTube or other video content.

There is currently no wholesale charge for content delivered over Telstra's WDSL network.

Price level options

[c-i-c commences]

[redacted]

[24] http://www.telstra.com.au/tv/tbox/packages/index.htm and http://www.telstra.com.au/tv/tbox/movies/.

[redacted] **[c-i-c ends]** The price level for WDSL has a direct impact on congestion on all ADSL networks, including Telstra's. A lower WDSL price will cause:

- A growth effect: where more customers decide to purchase ADSL;
- A substitution effect: where more customers substitute from other networks (HFC and mobile networks) to ADSL networks;
- A price competition effect: where Telstra and Telstra's competitors further collapse the structure of their retail plans to make price less dependent on usage.

[c-i-c commences]
[redacted] **[c-i-c ends]** The remainder of this section discusses two of the established regulatory approaches to setting price levels (retail minus and the FLSM). The section discusses the implications of each approach with respect to congestion experienced by retail and wholesale customers, and the statutory criteria more generally. The conclusions reached in this section are that:

- The retail minus approach is by far less likely to cause material damage to customer experience in the form of congestion than the FLSM;
- Generally, retail minus approaches can promote the statutory criteria if properly set so that the cost of congestion is properly accounted for; and
- If retail minus prices are designed in a way to deliver the same wholesale prices as currently charged or lower prices, then this is likely to harm the statutory criteria as congestion worsens.

1) Retail minus

The ACCC currently sets wholesale ADSL prices using an RMRC methodology. There are a number of benefits associated with this approach from the perspective of the LTIE.

First, when retail prices are efficient and competitively set, a properly specified retail minus WDSL price would also be efficient and competitive. Telstra's retail ADSL prices reflect the strong competition that exists in competitive areas, but also the fact that the wholesale prices have been regulated since the beginning of 2012, without accounting for current congestion. While competition is most intense in the 289 ESAs[25], Telstra's nationally-averaged pricing policy results in the competitive prices being passed on to all ESAs across Australia where ADSL is available, as illustrated below.

[25] Telstra Corporation Limited, Response to the Commission's Issues Paper (a second discussion paper) into the public inquiry to make a final access determination for the wholesale ADSL service, 24 August 2012 – Non-price terms, sections 2.1 and 2.5

[c-i-c commences] [redacted]

[redacted]

[redacted] **[c-i-c ends]**

Second, a retail-minus approach is relatively inexpensive to implement (as opposed to a full-blown cost approach). Cost, in this sense, is not only the effort required to implement the approach, but also the level of accuracy and the market implications arising from imposing an incorrect wholesale price point. Relative to a retail-minus approach being based on Telstra's competitive retail prices, cost-based prices are much more likely to result in a greater risk of error. The competitive market must be better at determining a competitive price than a cost modeller. Issues with respect to the estimation of cost are discussed in the next section.

Third, a retail-minus price approach for WDSL would also be "equivalent". Telstra appreciates that the ACCC will be concerned with equivalence in light of Telstra's vertical integration – being the supplier of retail ADSL, wholesale ADSL and ULLS/LSS services. Equivalence in this context will be achieved when the outcomes (including prices) resulting from the retail-minus methodology are similar to or the same as those outcomes that would arise in a market unaffected by vertical integration (that is, where many competitors are vertically integrated or they are all vertically separate). Gowrisankaran and MacKie-Mason show that congestion pricing would be a component of retail pricing in a competitive market where competing suppliers are all vertically integrated (that is, no firm is advantaged relative to the others by reason of vertical integration), and that this is socially-efficient. They also show that the mere fact that having a wholesale market does not impact that conclusion.[26] The Frontier Economics Expert Report demonstrates that the retail minus methodology can deliver equivalence by reference to Tye's "Indifference Corollary".[27]

[26] Expert Report of Gowrisankaran and MacKie-Mason - Efficient Pricing of ADSL Wholesale services – Report prepared for Telstra, August 2012, section 9.2.2.

[27] Expert report of Frontier Economics – ADSL network congestion pricing and use of RMRC – Report prepared for Telstra, August 2012, pp. 15-18 and Tye, W.B. (2002), "Competitive Neutrality: Regulating Interconnection Disputes in the Transition to Competition", presented to ACCC *Regulation and Competition Conference*, July 25-26.

Fourth, if the retail-minus approach is not based on a monopoly retail price, which it wouldn't be, it does not result in Telstra earning any monopoly rents. As discussed above, Telstra's retail prices are set in the context of strong competition and, consequently, are not inflated by any lack of competition. A WDSL price based on RMRC will consequently not contain any monopoly rents.[28]

[c-i-c commences]
[redacted]**[c-i-c ends]**

Further, retail-minus approaches are not without issues that need to be overcome at implementation. Past discussions have identified the following ways of addressing these issues with retail-minus approaches:

- Ensuring the WDSL prices is not based on a single retail price point, but based on average yields;
- Ensuring that changes to retail prices and retail costs are passed through the retail minus mechanism without delay; and,
- Ensuring retail costs are appropriately measured.

2) FLSM

The ACCC currently uses the FLSM model to set prices for ULLS, LSS and other fixed line services. The FLSM is a type of BBM that adds the various components of costs (capital, depreciation, opex and tax) to determine a revenue requirement, and unitises that revenue requirement to determine prices for those services.

There are several reasons why applying the FLSM to WDSL would substantially harm the statutory criteria.

First, the ACCC has adopted (what Telstra considers to be an incorrect) approach of unitising annual costs (including related to new capex) on the basis of peak, historical demand. When demand is decreasing, the implication of this approach is that the allowable revenue is less than the revenue required to recover annual costs by the same proportion as the reduction in current demand relative to peak demand.[29] The ACCC's justification for this approach, which Telstra considers is an error, is that Telstra should not be compensated for a reduction in its market share (further discussion on this error is included in Appendix A).

If the ACCC considers that this approach is not in error, then Telstra's expectation is that, if the FLSM is applied to WDSL, less than between **[c-i-c commences]** [redacted]**[c-i-c ends]** and **[c-i-c commences]** [redacted]**[c-i-c ends]** of the revenue requirement will be allowed to be recovered by the ACCC. The **[c-i-c commences]** [redacted]**[c-i-c ends]** and **[c-i-c commences]** [redacted]**[c-i-c ends]** statistics are the ratios of current ADSL SIO demand to SIO demand at its highest historical level, measured over different combinations of ADSL products. Note that while ADSL traffic has grown at over **[c-i-c commences]** [redacted]**[c-i-c ends]** per annum, SIOs have fallen from their historic peak. If ADSL SIOs were forecast to decline in the future, then Telstra expects that the ACCC would only allow Telstra to recover even less of its revenue requirement.

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[28] Expert report of Frontier Economics – ADSL network congestion pricing and use of RMRC – Report prepared for Telstra, August 2012, pp. 16, 17.
[29] Lockey, Keith "Calculation of Revenue Impact From Changing Demand Volumes," *Letter from KPMG Executive Director to Telstra,* 1 June 2011.

Importantly, this approach is applied to new capex and capital already in Telstra's asset base. Hence, if WDSL prices were set on the basis of the FLSM, Telstra's expectation would be that the cost of any future investment to expand investment would not be recovered.

Second, the building block framework is one that was developed in the relatively stable gas and electricity transmission network markets, and was recently applied to the relatively stable fixed line services. It is not suited to dynamic markets such as ADSL markets. This has a number of implications.

For instance, building block models in general are predicated on capex and opex being relatively stable and predictable over time (capex and opex forecasts are entered into the model to determine prices). Deviations that do occur between forecast and actual spend create an incentive for firms to spend efficiently. For instance, in the FLSM context, Telstra keeps spend below and suffers spend above what has been forecast. In energy markets there is a more complicated efficiency benefit sharing scheme which shares the over or under spends between service providers and consumers. Either way, there is an incentive for the supplier to undertake the investment and spend the minimum amount in doing so. However, the market stability assumed for building block models does not exist in ADSL markets. In dynamic, competitive and uncertain ADSL markets,[30] actual capex and opex requirements can quickly become substantially higher (or lower) than forecast, given changes in patterns of demand, customers moving to alternative suppliers and changes to the substitutability between different services. If such a deviation becomes clear to the regulated firm, then at some point searching for additional efficiencies is unlikely to bridge the gap. Instead, the firm is left with no alternative but to terminate spend that would otherwise be efficient. This outcome would harm the statutory criteria. The harm would be somewhat reduced by using some adjustment mechanism to ensure that incorrect forecasts are quickly remedied in prices, but currently no such mechanism exists in the FLSM.

Additionally, the building block model would need to be flexible in other regards to changes in the supply and consumption of the service. For instance, a choice of rules to allocate costs between WDSL and other services might quickly become out of date if the relative characteristics of those services changed. If the building block model is unable to be updated, then it will quickly begin to distort the market and harm the statutory criteria.

Third, the FLSM would need to account for the truncated asset life of additional capex. Should the NBN be rolled out in accordance with its corporate plan, then all ADSL-related capital will need to be depreciated by the time the NBN makes those investments redundant.

Fourth, current prices for ADSL are comparative to the prices for comparable NBN services. If the application of the FLSM were to result in a change in wholesale ADSL prices, then this would impact the incentives for customers to migrate to the NBN. The implications of any change to the timing of customer migration from Telstra's network to NBN Co's impact the timing and therefore present value of NBN Co's costs and revenues.[31]

[c-i-c commences]

[redacted]

[30] For instance, ADSL markets are subject to technological change, not only in supply (for example, new DSLAM and backhaul technologies arising) but also in demand (for example, new media becoming available but requiring high speed connections to the Internet). There are also many close substitutes to ADSL (for example, HFC, 4G broadband) that are similarly faced with technological change that can affect the demand for ADSL. Also, there is considerable policy (for example, NBN) and regulatory (for example, this consultation) uncertainty.

[31] Such a change would also impact the operation of the long term revenue constraint (LTRC) in NBN Co's SAU. A delay in migration is a delay in revenue, which translates to a higher accumulated loss in the LTRC, higher regulated revenue allowances, and in the long-run higher NBN prices.

[redacted] **[c-i-c ends]**

The solution that best promotes the statutory criteria

There is a growing potential for congestion to worsen customer experience on the ADSL network. Current WDSL prices are a contributing factor. An increase in price to reflect the social cost of congestion would best promote the statutory criteria since, although customers would pay more for ADSL services, they pay for a less congested network and a better customer experience.

An alternative would be to leave the price level as it is, calculated under an RMRC approach.[32] Customers would pay the same price for ADSL services, but industry congestion would increase and customer experience would worsen. Changes to the structure of WDSL prices might alleviate some of the congestion but would not solve it.

[c-i-c commences]
[redacted] **[c-i-c ends]**

[32] An RMRC approach that overcomes any implementation issues might further promote the LTIE.

Appendix A: Unitisation error in the FLSM

The FLSM is used by the ACCC to calculate the wholesale prices that Telstra is permitted to charge to recover its direct costs of providing the declared fixed line services. The FLSM applies an approach to unitising annual costs for each fixed line service based on peak historical demand. For copper cable and duct and pipes costs, it divides the annual revenue requirement resulting from the building block model by the number of units of demand in 2009/10 expressed as SIOs. For public switched telephone network ("**PSTN**") switching costs, it divides the revenue requirement by call minutes in 2002/03. The calculation of unit costs is based on peak historic demand, therefore the FLSM minimises the costs per unit and then applies these costs as constant over the regulatory period, despite demand falling below their peak levels.

This approach is in error for the following reasons which are discussed in further detail below:

- It is applied to variable and unavoidable costs – such as operating expenditure and tax – and variable costs are, by definition, dependent on current demand not historic demand. This approach prevents their recovery;
- Even to the extent that it is applied to fixed costs, it incorrectly assumes those costs are unrecoverable due to competition. Even if assets have been stranded, they have already been depreciated out of the asset base. Further, new capex is not stranded as soon as it is entered into the asset base, but is instead needed despite reductions in demand; and
- The ACCC incorrectly argued that Telstra had previously been compensated for this lack of recovery from the weighted average cost of capital ("**WACC**").

The correct approach for the FLSM would be to set unit prices based on actual demand, thus allowing recovery of actual costs. This would better promote the LTIE because it would allow for the recovery of actual costs. Investors who cannot recover their costs will not invest – even in a socially-optimal investment – which would be to society's detriment.

Background

The ACCC utilises the BBM to establish the revenue requirement for the declared fixed line services through the equation:

$$\text{Revenue Requirement} = \text{Return on Capital } [RAB_{t-1} * WACC] \quad (1)$$

$$+ \text{Operating Expenditure}$$

$$+ \text{Return of Capital [Depreciation]}$$

$$+ \text{Tax}$$

where RAB_{t-1} = the closing value of the regulatory asset base for the previous year.

The BBM calculates Telstra's total revenue requirement by adding together each of the cost categories faced by Telstra with the objective of ensuring that the revenues calculated cover Telstra's costs. The ACCC's BBM for fixed line services, the FLSM, calculates the total costs of supplying the declared services provided over the CAN and the inter-exchange network (IEN) or core.

The five declared fixed line services are the ULLS, the LSS, PSTN originating and terminating access (PSTN OTA), wholesale line rental (WLR), and the local carriage service (LCS).

The BBM's return on capital requires the establishment of an initial value for Telstra's investment. Once identified, the value is locked in as the initial RAB and rolled forward from one regulatory period to the next by adjusting for depreciation, new investment and asset disposals.

$$RAB_{t+1} = RAB_t + capital\ expenditure_t - depreciation_t - asset\ disposals_t \qquad (2)$$

Where:

RAB_{t+1} = opening RAB for the next regulatory year

RAB_t = opening RAB for the current year

$capital\ expenditure_t$ = forecast capital expenditure during the current year

$depreciation_t$ = depreciation during the current year

$asset\ disposals_t$ = asset disposals during the current year.

The annual revenue requirement consists of both fixed and variable costs. A material proportion of costs are likely to be variable.[33] While the majority of capital costs are most likely to be fixed in the short run, some will be variable. A considerable share of operational expenditure is likely to be variable. Operating expenditure for fixed line services consists of, for example, maintenance expenditure to repair faults and maintain the quality of service provided by the network, as well as the direct costs of running the network. Taxation is purely a variable cost. Taxation is calculated by applying the corporate income tax rate of 30 per cent to the taxable income (revenue – [operating expenses + depreciation + interest]). The variability of taxation can be shown by a simple example:

- When there are no sales of a service, the resulting income is nil and the consequent tax is therefore nil;
- When 50 units of a service are sold resulting in $50 of net income, the consequent tax is $15 (30% corporate income tax * $50 net income); and
- When 100 units of a service are sold resulting in $100 of net income, the consequent tax is $30 (30% * $100).

The FLSM is used to calculate the wholesale prices that Telstra is permitted to charge to recover its direct costs of providing the declared fixed line services. It does so for copper cable and duct and pipes costs by dividing the annual revenue requirement by the number of SIOs in 2009/10. For switching costs it divides the annual revenue requirement by call minutes in 2002/03. The copper cable and duct and pipe unit cost is a component of the regulated prices for ULLS and WLR SIOs. The switching unit cost is a component of the regulated price for PSTN OTA and LCS call minutes.

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[33] A 2010 study found that Telstra's total factor productivity over the period 2003/04 and 2008/09 increased by **[c-i-c commences]** [redacted] **[c-i-c ends]** (defined as the ratio of outputs (quantities sold) to inputs (costs)). In that time, inputs declined by **[c-i-c commences]** [redacted] **[c-i-c ends]** and outputs by **[c-i-c commences]** [redacted] **[c-i-c ends]**. The fact that inputs were variable and declined by more than outputs is characteristic of the presence of variable costs. If inputs were composed entirely of fixed costs, they would not reduce in the face of declining output, except when driven purely from efficiency enhancements. See Telstra (2010) *Submission in Response to the Australian Competition and Consumer Commission's Review of Telstra Price Control Arrangements*, 12 February: p. 29, Table 10. The ACCC found in 2002, that conveyance (including switching) costs generally were somewhat sensitive to demand. See ACCC (2000), *A Report on the Assessment of Telstra's Undertaking for the Domestic PSTN Originating and Terminating Access Services*, July 2000, section A1.2.1.

The FLSM's approach to unitising annual costs for each fixed line service on the basis of peak historical demand is incorrect. When demand is decreasing, this approach has the effect of restricting the revenue that can be recovered from regulated prices to less than the revenue required to meet actual costs, thus resulting in stranding of these costs.[34] Demand for services using copper cable, ducts and pipe, and switching assets has been decreasing from historical peaks.

[c-i-c commences]

[redacted]

[redacted]

[redacted]

[redacted] **[c-i-c ends]**

The result of the ACCC's approach is that the actual revenue received from regulated prices is less than the revenue requirement for each of the "blocks" in the FLSM building block model (operating expenditure, depreciation, return on capital and tax). The under-recovery of the cost of each of the blocks is demonstrated below, with respect to just the first year of its operation – 2009/10. Since demand for the relevant services has declined further since 2009/10, the impact in later years is much higher.

How the FLSM prevents recovery of the annual revenue requirement

Ducts and Pipes

[34] Costs become stranded when investments made in the prior period of cost of service regulation cannot expect to earn their cost of capital as a result of the new rules. See Kolbe, A.L. and Tye, W.B. (1996) "Compensation for the Risk of Stranded Costs", *Energy Policy*, 24(12): pp. 1025-1050.

The FLSM calculates the revenue requirement for 2009/10 as: **[c-i-c commences]**

[redacted]

[redacted]

[redacted]

[redacted] **[c-i-c ends]**

Copper Cables

The FLSM calculates the revenue requirement for 2009/10 as:**[c-i-c commences]**

[redacted]

[redacted]

[redacted]

[redacted]**[c-i-c ends]**

Switching Equipment (Local)

The FLSM calculates the revenue requirement for 2009/10 as: **[c-i-c commences]**

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] **[c-i-c ends]**

The error in the ACCC's approach

This approach is an error for the following reasons, discussed in further detail below:

- It is applied to variable and unavoidable costs – such as operating expenditure and tax – and variable costs are, by definition,[35] dependent on current demand not historic demand. This approach prevents their recovery.
- Even to the extent it is applied to fixed costs, it incorrectly assumes those costs are unrecoverable due to competition. Even if assets have been stranded, they have already been

[35] Organisation for Economic Cooperation and Development (2007) *Glossary of Statistical Terms* (OECD Publishing): p. 873.

depreciated out of the asset base. Further, new capex is not stranded as soon as it is entered into the asset base, but is instead needed despite reductions in demand.

- The ACCC incorrectly argued that Telstra had previously been compensated for this lack of recovery from the WACC.

Application to variable costs

A material proportion of the annual revenue requirement relating to copper cable, duct and pipes and switching is comprised of variable costs. While the majority of capital costs are most likely to be fixed in the short run, a substantial share of operational expenditure is likely to be variable and tax is purely a variable cost.

Variable costs by definition vary with demand. Hence, the variable costs spent in any year are directly related to the demand in that year. They are not related to peak historical demand. All other things held constant, variable costs would be higher than in past years of higher demand, and the reduction in variable costs due to lower demand would have already been accounted for in the opex forecasts used in the FLSM and the calculation of tax. Therefore, it is an error to assume that the variable costs in the revenue requirement for a current year should be further reduced because at some point in the past (as far back as 2002/03) demand was higher. The following simplified example illustrates this.

Example: Bill's Bakery

In this example Bill's Bakery produces one product (bread loaves) for two years and, in the second year, is subjected to the ACCC's FLSM to calculate its annual revenue requirement. Bill's costs, for flour to bake the bread, are variable.

In the first year, Bill's Bakery purchases 10 bags of flour for $10 to produce 10 loaves of bread for sale. The unit cost is $10/10 loaves = $1 per loaf. Bill charges $1 to recover his cost.

In the second year, due to an increase in competition, demand is lower. The bakery purchases 8 bags of flour for $8 to produce 8 loaves of bread.

However, the ACCC's FLSM calculates Bill's Bakery's unit cost and price (of 80 cents) by dividing the revenue requirement in year 2 of $8 by the year 1 (peak) demand of 10 loaves ($8/10 loaves). Despite the revenue requirement being $8, the revenue Bill's Bakery can actually recover from regulated prices is 8 x $0.80 = $6.40. This result represents a shortfall in cost recovery of 20%.

Application to fixed costs

A substantial proportion of capital costs are likely to be fixed. To the extent that a proportion of these costs have been stranded due to competition, that proportion would have already been depreciated out of the initial asset base to take into account declining demand.

Telstra's Corporate Accounting Instructions, in compliance with Australian Accounting Standards, require that the service life of assets, which determines the rate of depreciation over time, be reviewed annually for the purpose of ensuring that the service lives reflect the most recent assessment of the useful lives of the respective assets, having regard to such factors as asset usage and the rate of technical and commercial obsolescence

The service life of an asset determines the period of time over which the capital cost is recovered through depreciation. The service life determination is a forecast of the actual time for which the asset will contribute to the revenue earning capability of Telstra.

The Australian Accounting Standards Board advocates consideration of all of the following factors for determining the useful life of an asset for the purpose of depreciation:

- Expected usage of the asset
- Expected physical wear and tear
- Technical or commercial obsolescence
- Legal or similar restrictions on the asset, such as the expiration of a lease.[36]

Usage generally varies in relation to the level of demand.

Consequently, the annual revenue requirement relating to the initial asset base already takes into account reductions in demand by depreciating the related assets.

The ACCC's approach is also applied to new capital expenditure, spent after peak demand. Thus, the annual revenue requirement relating to that new capital expenditure is also divided by peak demand (as far back as 2002/03 for switching equipment capital expenditure) and subject to the same stranding. For 2010/11 and 2011/12 combined, the FLSM expects that Telstra will have spent **[c-i-c commences]** [redacted] **[c-i-c ends]** in new capital expenditure on these assets.[37]

The WACC does not recover the shortfall

The ACCC's response to Telstra's critique that the unitisation method is incorrect has been to attribute it to the issue of market share. Specifically, the ACCC has argued that its approach is based on its view that it "...was not appropriate to compensate Telstra for a loss of market share or for reductions in the size of the market. The ACCC considered that Telstra had been adequately compensated for these business risks through the risk premium included in the commercial rate of return provided by the WACC."[38] The ACCC's argument errs both in theory and in practice.

The market risk premium is the additional yield that an investor expects to earn from an investment in the market above the return that can be earned from a risk-free investment, such as the government bond rate. The market risk premium is contained in the capital asset pricing model to calculate the cost of equity capital. The debt risk premium is the additional yield an investor expects to earn to reflect the firm's risk of default above the risk-free bond rate of return. The asset beta is used to reflect volatility or systematic risks to assets (including demand risk) compared to the market as a whole. The equity beta is intended to reflect the business and financial risks to the firm compared to the market as a whole.[39]

It is a matter of fact that the ACCC has not increased the risk premium contained in the WACC to address the risk of declining demand. On the contrary, as shown in Figure A5, the ACCC has reduced the risk premium over time. By preventing the recovery of legitimate business costs, the unitisation method has the effect of increasing the difference between the risk-free rate of return and the risk of the assets in question, thereby necessitating a higher risk premium.

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[36] Australian Accounting Standards (2009) *AASB Standard 116: Property, Plant and Equipment*, paragraph 56.
[37] FLSM (2011) Spreadsheet 8: Table 8.2.1.
[38] ACCC (2011): p. 98.
[39] ACCC (2000) *A report on the assessment of Telstra's undertaking for the domestic PSTN Originating and Terminating Access Services*, July: p. 80 and Bowman, R.G. () *Report on WACC for ULLS and SSS*, http://www.accc.gov.au/content/item.phtml?itemId=692005&nodeId=c4dbb4cb3ecdaef9e3f0ea14731cf874&fn=Telstra%20-%20report%20on%20WACC%20for%20ULLS%20and%20SSS.pdf (accessed 14 August 2012).

Figure A5: ACCC Risk Premium for Telstra Determinations

Date of decision	Asset beta	Equity beta
July 2000[135]	0.5	0.83
October 2003[136]	0.5	0.83
August 2006[137]	0.5	0.83
April 2009[138]	0.5	0.83
August 2009[139]	0.5	0.83
September 2010[140]	0.42	0.7

Source: Telstra (2011) Public inquiry to make final access determinations for the declared fixed line services: Part A of Telstra's Response to the Commission's Discussion Paper, June, http://www.accc.gov.au/content/item.phtml?itemId=991351&nodeId=cf4a8c9ed0a41bdffa36f436dad4973a&fn=Part%20A%20of%20public%20submission%20from%20Telstra.pdf p. 46.

The ACCC's argument that the risk of declining market share and any attendant stranded costs are addressed by the "commercial rate of return provided by the WACC" is also incorrect in theory. As Telstra has shown above, the FLSM will strand certain costs. Kolbe and Tye (1996) point out:

> *From the law of averages, the average of the rates of return expected on investments prior to the transition [to new regulatory rules] (equal to the cost of capital) and the rates of return expected after the transition (less than the cost of capital) is less than the cost of capital.*[40]

Therefore, it is not possible that the commercial rate of return in the new regulatory period will recover the cost of capital.

Actual demand units should be used to address the problem

Telstra has suggested that as a solution to the problem of under recovery of revenue, the standard unit costs should be calculated by dividing the revenue requirement in a given year by the actual demand in the same year. This would reflect actual average costs and enable Telstra to recover its legitimate commercial costs.[41]

$$\text{Average cost per unit}_t = \frac{\text{annual revenue requirement}_t}{\text{number of SIOs}_t} \qquad (11)$$

[40] Kolbe and Tye (1996): p. 5.
[41] Telstra Corporation Limited (2011) *Public Inquiry to Make Final Access Determinations for the Declared Fixed Line Services: Part A of Telstra's Response to the Commission's Discussion Paper*.

The ACCC has instead taken the view that "Telstra's proposed approach would mean that as total demand fell, the costs of the network would be recouped from a smaller number of remaining services. Adopting this approach would increase the unit costs of providing all remaining services."[42]

Conclusion

As noted, Telstra's proposed solution is that unit prices should be set by dividing the revenue requirement in a given year by the number of SIOs in the same year to reflect actual annual average costs and only then will Telstra to be able recover its legitimate commercial costs.[43] This would promote the LTIE.[44]

By allowing Telstra to recover its direct costs, this approach would stimulate investment in the services. An investor who cannot recover their direct costs will not invest, even in a socially optimal investment, which would be to society's detriment.

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[42] ACCC (2011) *Inquiry to make final access determinations for the declared fixed line services: final report.*
[43] Telstra Corporation Limited (2011) *Public Inquiry to Make Final Access Determinations for the Declared Fixed Line Services: Part A of Telstra's Response to the Commission's Discussion Paper*: For an analysis of pricing at average cost and marginal cost see Melody (2010): p. 213.
[44] *Competition and Consumer Act 2010* (Cth), s 152AB.