ROLE OF TSLRIC IN TELECOMMUNICATIONS REGULATION

A Report for Optus

Prepared by NERA

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1. INTRODUCTION AND BACKGROUND

1.1. Purpose and Report Structure

Telstra has provided an undertaking to the ACCC in relation to the declared telecommunications services: PSTN O/T[1] and the unconditioned local loop service (ULLS). The price terms in Telstra's undertaking are based on a forward-looking cost model of the PSTN termed 'PIE II'. PSTN O/T is an access service used as an input into the provision of long distance and other 'preselect' services. ULLS is an alternative to PSTN O/T and is also used as an input into into providing broadband data services. Use of ULLS requires additional investment in infrastructure by new entrants compared with PSTN O/T.

In the context of reviewing Telstra's PIE II forward-looking cost model, Optus has asked to NERA to address the following questions:

> *What is the economic rationale for the use of TSLRIC in setting appropriate access prices? In particular, what is the appropriate interpretation of scorched node TSLRIC in setting access prices?*

Optus has also asked NERA to have regard to the legislative criteria established in Part XIC of the Trade Practices Act which guide the ACCC's decisions in setting access prices for 'declared' telecommunications services. The object of Part XIC is to promote the long-term interests of end-users of carriage services or of services provided by means of carriage services.

The structure of the remainder of the report is as follows:

- Section 2 provides a generic discussion of the role of 'costs' in setting access prices and, in particular, the role of 'forward-looking' costs; and

- Section 3 provides practical application of the theory developed in section 2 to issues in setting regulated access prices for declared telecommunications services PSTN O/T and the ULLS. In particular, the role of forward-looking costs in relation to the following issues are addressed:

  - sharing of trenches with other utilities under scorched node TSLRIC modelling;

  - the role of historic costs and decisions in scorched node TSLRIC modelling;

  - the appropriate treatment of the access deficit contribution;

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1 Public switched telephone network originating and terminating access service.

- averaging of ULLS costs over different geographic regions; and

- averaging recovery of the access deficit over different geographic regions.

1.2. Legislative Criteria

The object of Part XIC is to promote the long-term interests of end-users of carriage services or of services provided by means of carriage services. In assessing this objective the ACCC must have regard to, inter alia, the following matters:

i. whether the terms and conditions promote the long-term interests of end-users of carriage services or of services supplied by means of carriage services;

ii. the legitimate business interests of the carrier or carriage service provider concerned, and the carrier's or provider's investment in facilities used to supply the declared service concerned; and

iii. the economically efficient investment in the infrastructure by which listed services are supplied.

2. THEORETICAL ROLE OF FORWARD-LOOKING COSTS

If an infrastructure asset used as an input to downstream markets is a natural monopoly (bottleneck asset) then the owner of that asset can exercise market power by pricing the asset's services above the level necessary recovery cost of legitimate costs. Where an infrastructure asset is believed to exhibit bottleneck characteristics then there may be a role for regulators to set maximum access prices the bottleneck owner can charge downstream competitors.

In setting the level of access prices the regulator generally has the following three primary objectives in mind:

1. to send appropriate build/buy signals for competing infrastructure;

2. to promote allocatively efficient consumption decisions by end users (ie, efficient use of the bottleneck); and

3. to promote dynamic efficiency by providing adequate compensation to the owner of the bottleneck for the long run costs of providing the service (consistent with the bottleneck owner's legitimate business interests);

The role of forward-looking costs in setting access prices that achieve each of these objectives is discussed in the following subsections.

2.1. Promote Efficient Build/Buy Decisions

2.1.1. Avoiding Inefficient Bypass

Bypass of an infrastructure asset occurs when a rival invests in competing infrastructure that provides substitute services. Inefficient, bypass occurs where the cost of the services provided by the new infrastructure is greater than the cost that would have been incurred in providing those services over the existing infrastructure.[2]

A new entrant will have an incentive to bypass the existing infrastructure if the perceived cost to them of building an alternative infrastructure is less than the cost they are faced with in using the existing infrastructure. This gives rise to the following access pricing rule:

[2] And where that additional cost is not justified by additional benefits associated with the new infrastructure above and beyond those provided by the existing infrastructure

Access price consistent with avoiding inefficient bypass of existing service	$\leq$	*New entrant's perceived average cost of building alternative infrastructure.*

There are three important aspects of the above rule, namely:

- the service potentially subject to bypass must be clearly defined;
- it is the *new entrant's* forward-looking cost for that service that is relevant when the objective is to prevent inefficient bypass; and
- it is the new entrant's perceived *average* cost of the bypass that is relevant.[3]

Defining the relevant bottleneck service is important because a single bottleneck often provides great variety of sub services each of which is subject to bypass. If access price structures do not reflect this variety of services then the potential for inefficient bypass can be increased significantly. This is because while the new entrant's average forward-looking cost may be less than the average access price across all services it may still be substantially below the average access price for sub sets of these services.

This sort of problem occurs most commonly when access prices are subject to some form of averaging across services. For example, the services provided by a telecommunications or energy distribution network are in reality customer specific. The average cost of providing the bottleneck to a particular customer depends on their location and on their total demand. In general, the more densely populated the location and the higher the customer demand the lower the average cost of serving that customer. Setting a uniform average access price per unit (eg, $/min) irrespective of the customer's location or usage increases the likelihood that this price will be above the new entrant's forward-looking cost of bypass for some customers. Examples of inefficient bypass driven by averaging of access prices are common. Inefficient bypass of the CAN serving high demand business customers by US long distance operators is one example as potentially is the attempted bypass of CitiPower's electricity distribution area by Powercor in serving the Docklands in Melbourne. .

The second and third dot points are equally important. The second dot point highlights that the new entrant's costs of bypass will be unconstrained by the technology used in the existing infrastructure. This is more consistent with a 'scorched earth' (unconstrained optimisation) than with a 'scorched node' (constrained optimisation) of the existing infrastructure. However, this does not mean that a scorched earth *monopoly network* (ie, the total cost of such a network divided by total market volumes) approach to modelling must be employed to avoid the risk of inefficient bypass. This is because, as noted in the third dot point, the commercial decision as to

[3] Which is a function of the volume of services the new entrant expects to supply over the alternative infrastructure which is in turn dependent on the market share of end users the new entrant expects to serve.

whether to bypass will depend on the new entrant's *average* cost of bypass – which is a function of both total cost and the new entrant's post investment market share.

If economies of scale exist, as must be the case for a true bottleneck service, then it is possible that access prices can be set above the scorched earth forward-looking average cost of *rebuilding a monopoly network* (ie, the total cost of such a network divided by total market volumes) without inducing inefficient bypass. This is because the new entrant knows that rather than owning a monopoly following any bypass, it will have to share the market with the existing infrastructure owner.

This can be illustrated with an example, suppose that the scorched earth forward-looking cost of building a new gas pipeline from gas field A to population B is entirely fixed and is $100m per annum. Let total annual demand for transport be 100m peta joules resulting in an average forward-looking 'scorched earth' *monopoly network* cost per peta joule of $1. However, imagine that the existing pipeline is currently charging $2 per peta joule and has considerable excess capacity on the pipeline. Will a downstream retailer of gas in B have an incentive to (inefficiently) bypass the existing pipeline by building a duplicate pipeline between A and B for the cost of $100m? The answer to this question is not obvious as it depends on the volume the retailer can expect to carry post bypass. Only if the retailer can expect to carry more than 50m pet joules will bypassing the existing pipeline be expected to reduce *average costs* below the current $2 per peta joule charge.

The important conclusions from this analysis can be summarised as:

- scorched earth forward-looking cost, not scorched node forward-looking cost, is the relevant cost concept regulators should have regard to when attempting to prevent inefficient bypass;
- the scorched earth forward-looking cost of the new entrant must be matched to the potential bypass decisions of the new entrant (eg, to bypass the existing infrastructure to serve x% of high value customers in area y);
- this may or may not bear any close resemblance to the average scorched earth cost of a monopoly network (ie, the scorched earth cost of the entire network divided by total usage) because:
    - the entrant does not need to serve the entire network (including high cost low demand customers); and
    - a new entrant can not necessarily expect to win 100% of the existing market served by the bottleneck owner.

2.1.2. Promoting Efficient Infrastructure Competition

In some situations there may be uncertainty as to whether, or the extent to which, the existing infrastructure asset is a true bottleneck. Alternatively, it may be believed that the existing infrastructure asset is currently a bottleneck but that technological innovation and the passage of time mean that this may stop being the case in the future. (The traffic sensitive component of the PSTN infrastructure may fall into one of the above categories.) Under these circumstances the regulator will not only be concerned to avoid inefficient bypass but also to avoid stifling *efficient* bypass by economically superior competing infrastructure. Efficient investment can be stifled by setting access prices so low that potential entrants choose to use the incumbent's infrastructure even though it would be more efficient for them to build their own.

In order to determine what level of access prices will be low enough to stifle efficient investment in competing infrastructure it is necessary to define what constitutes such efficient investment. Assuming that there are no external costs or benefits, efficient competing investment can be defined as investment that lowers the long run[4] production cost of providing the services currently supplied by the existing infrastructure. That is, investment is efficient if:

The long run (incremental) cost of new capacity in the form of competing infrastructure	<	*The long run incremental cost of adding new capacity to existing infrastructure*

It follows that provided the access price is set above the long run incremental cost of adding new capacity to existing infrastructure then the new entrant will have the correct incentives for efficient bypass. There are two implications of the above rule that should be emphasised:

- the correct cost measure is the scorched node (constrained optimisation) forward-looking cost of the existing infrastructure; and
- the appropriate forward-looking cost measure is the incumbent's long run incremental cost (LRIC) of providing the necessary additional capacity *not* the total service long run incremental cost of existing demand (TSLRIC).

The first dot point follows from the fact that economic efficiency in production decisions depends on a comparison of the actual costs that would be incurred by the incumbent compared to the actual costs that would be incurred by a new entrant in serving new capacity. If the access price is to avoid stifling efficient investment by competitors it must not be set

[4] In fact, economic efficiency requires a comparison of the net present value of production costs under different scenarios. Minimising the net present value of production costs is equivalent to, at any given point n time, choosing the production process with the lowest short run marginal cost. However, long run marginal production cost can be, and often is, used as a proxy for the net present value of all future short run marginal production costs.

below the incumbent's actual cost of expanding its existing network - *given its existing network configuration*.

The second dot point is very similar to the first and is based on the fact that the level of cost incurred previously by the incumbent in building its existing infrastructure capacity is irrelevant to the question of how new capacity can be most cost effectively provided. For example, if over the next 10 years the existing level of infrastructure capacity must be doubled to meet new demand then the appropriate question as far as economic efficiency is concerned is:

> *Is the least cost method of achieving this doubling the capacity of the existing infrastructure asset or building a new infrastructure asset with the same capacity?*

In answering this question the cost of the existing level of capacity (ie, the TSLRIC of existing demand) is irrelevant.[5]

An important assumption in reaching the above conclusions was that there are no external benefits from the existence of competing infrastructure. It may be appropriate to relax this assumption somewhat in order to account for the fact that competing infrastructures can provide a spur to dynamic efficiency and can reduce the necessary role of regulation and the scope for regulatory error. With the existence of such external benefits the rule for access pricing that prevents the stifling of potentially efficient investment becomes probabilistic and is:

Access price	≥	*The long run incremental cost of adding new capacity to existing infrastructure*	+	*Average expected value of external benefits from competing infrastructure*

[5] Once more, this can be illustrated with a variation on our previous gas pipeline example. Let the forward-looking cost of rebuilding the existing pipeline between A and B be $100m and the existing demand 100m pet joules. This gives rise to a TSLRIC of the existing pipeline of $1 per peta joule. However, now let the incumbent's long run incremental cost of providing additional capacity be $1.5 per peta joule over the relevant range. That is, the incumbent's cost of meeting expected increments of demand is, on average, $1.5 per peta joule.

If a competing pipeline can deliver the relevant increments to output at a lower cost than $1.5 per peta joule then it is efficient for the competing pipeline to be built. Provided the access price is set at or above $1.5 per peta joule an incentive exists for anyone capable of building a new pipeline at less than $0.5 per peta joule to do so.[5] However, the TSLRIC of *existing* demand is $1 per peta joule. If access prices are set at the TSLRIC of existing demand then the wrong signals are sent for the provision of competing infrastructure. Even if a potential competitor could cater for increased demand by building a new pipeline at a cost of, say, $1.3 per peta joule it would not do so given that it can buy transport from the incumbent at $1.

Of course, if the incumbent's cost of meeting incremental demand (LRIC) was lower than TSLRIC (as will commonly be the case) then the use of TSLRIC will not stifle efficient investment in competing infrastructure. However, it will be more likely to create an incentive for inefficient bypass of the existing infrastructure (by setting access prices above the incumbent's LRIC but below the new entrant's LRIC).

That is, if external benefits exist from the existence of competing infrastructure then, in the absence of any other instrument,[6] increasing access prices above the incumbent's LRIC for additional capacity by the expected value of such benefits may be appropriate. Of course, there is no reason to expect the difference between the incumbent's TSLRIC and LRIC to be a proxy for such external benefits.

2.2. Promoting Allocative Efficiency

Allocative efficiency is promoted by setting marginal consumption signals equal to short run marginal cost. To the extent this setting marginal access prices at short run marginal cost charging will not enable the bottleneck owner to recover its fixed costs then allocative efficiency may have to be sacrificed in order to give the bottleneck owner the ability and incentive to maintain the bottleneck service in the long run (ie, in order to promote dynamic efficiency).

2.3. Promoting Dynamic Efficiency

In order for the bottleneck owner to have an incentive to continue to maintain the bottleneck in the long run it is necessary that a certain level of cost recovery be achieved. Arguably, this is the level of cost recovery associated with meeting the bottleneck owner's 'legitimate business interests'. A potential definition of legitimate business interests that is often adopted in regulatory proceedings is as follows:

> *The legitimate business interests of a monopoly infrastructure owner require that it receive a fair rate of return on past and future investments that have been prudently incurred as a necessary input into the delivery of its monopoly services.*

It appears difficult to argue that this requirement does not form at least part of the definition of 'legitimate business interests'. That is, it is difficult to see how legitimate business interests do not include a fair rate of return on prudent investments necessarily incurred in the operation of the incumbent's business. Similarly, provided a business expects to receive a fair return on prudent investment it will have an incentive to continue making prudent investments in the long run. We adopt this definition in this report.

2.3.1. TSLRIC

TSLRIC arguably has a role in establishing exactly what is, and what is not, prudent investment. For example, a case can be made that a prudent level of (unrecovered) investment in existing infrastructure is any level up to the forward-looking cost of rebuilding the existing network to provide the same level of functionality as currently delivered. This would imply that an investment decision was prudent if its cost, less the level of capital recovery already achieved, was less than the cost of delivering the same level of functionality with a new

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[6] Such as a direct subsidy to competing infrastructure.

investment today. This has an intuitive appeal as it ensures that if the incumbent makes an investment using expensive technology that is shortly thereafter superseded by less expensive technology then the incumbent is deemed to have made an imprudent decision and only receives a return as if they had invested in the lower cost technology.

The important conclusion of this section is that the justification for using TSLRIC (or TSLRIC+) is *not* related to setting efficient build/buy decisions but is best justified on the grounds of providing for dynamic efficiency in the incumbent's future investments. That is, TSLRIC establishes a level of cost recovery that is consistent with the bottleneck owner's legitimate business interests in the long run. It follows that the appropriate interpretation of TSLRIC is driven primarily by what one considers a reasonable reflection the incumbent's legitimate business interests.[7]

This explains the adoption of the scorched node approach to TSLRIC modelling by the ACCC in the past. A scorched node approach limits the degree of optimisation of the existing infrastructure that can be embodied in forward-looking costs. In doing so, it effectively allows some historical decision making (such as surrounding the positioning of buildings) to be free from scrutiny under a 'prudency test'. A list of factors that so unconstrained in PIE II modelling include:

- Telstra's historical choice of technology such as the use of copper wire rather than mobile technology and circuit switching rather than packet switching technology;
    - the relative cost and substitutability today between mobile and fixed line telephony means that the PSTN would be unlikely to be built to service voice alone. If it was rebuilt today to serve data, it would likely be built on the basis of packet switched technology not circuit switched and with greater use of fibre optic cable. By 'fixing' the choice of technology the ACCC's modelling approach essentially protects Telstra's historical investments from this form of optimisation;
- Telstra's historical location of land and buildings; and
- Telstras' historical use of copper wire instead of radio/satellite technology in rural areas.

The decision to adopt a 'scorched node' approach effectively protects some of the incumbent's network from optimisation. However, there is a quid pro quo for customers in this in that elements so protected from optimisation should not be subject to the possibility that forward-

[7] Of course, other considerations may also play a role in the structure and type of access prices that are set. For example, TSLRIC may be used to set the overall level of reasonable costs but consideration of the risk of inefficient bypass may cause this to be recovered in a de-averaged manner or may give rise to the use of a particular structure of access prices (eg, two part tariff).

looking costs actually exceed historic costs. For example, if the decision is taken not to optimise the use of copper wire in the network it would be inappropriate for the TSLRIC costs of the network to increase significantly due to a rise in the price of copper above the historic price actually paid by the bottleneck owner.

2.3.2. Alternatives to continual reapplication of TSLRIC

Continued reapplication of TSLRIC overtime has been adopted in Australia as the means by which access prices for PSTN O/T and ULLS. However, there are alternatives to this approach that have as much, if not more, claim to addressing Telstra's legitimate business interests. In particular:

- applying a forward-looking costs methodology on a one off basis in order to establish a 'fair' value for Telstra's network assets and thereafter applying a building block approach to set access prices; or

- estimating the historically unrecovered cost of Telstra's network asset and thereafter applying a building block approach to set access prices.

Both of these approaches have in common that they go through a 'one off' process to establish a value for Telstra's network assets and then roll this forward (net of depreciation and reasonable new investment) in order to determine the capital costs that go to making up access prices.[8] Once an initial asset base is established, through whatever means, it can be rolled forward (removing depreciation and adding reasonable new capital expenditure) and used in conjunction with estimates of reasonable operating costs to establish annual access charges. This is the approach largely taken in relation to regulation of energy distribution/transmission infrastructure assets in Australia.

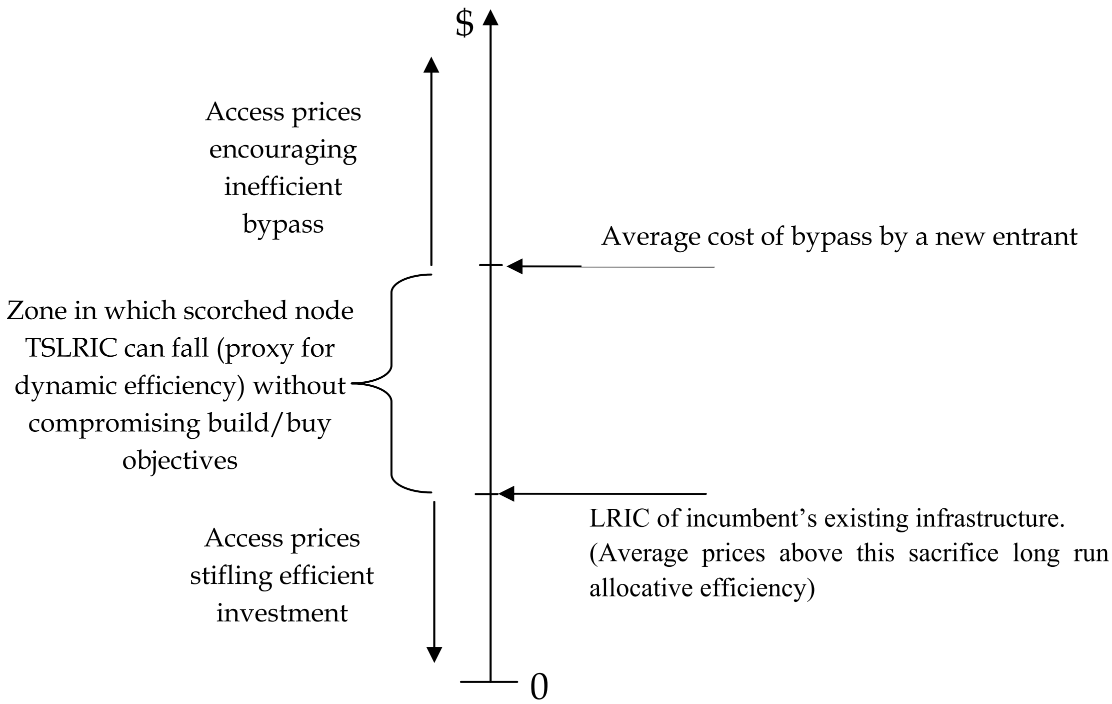
8 For example, under the first approach a scorched node TSLRIC model may be used to determine that the cost of rebuilding the Telstra network to its current level of functionality (say $1bn) and this would then be established as the initial regulatory asset value. Under the second approach the initial regulatory asset value would be established on the basis of the historic costs incurred by Telstra in building its network less the level of recovery of that cost implicit in historical revenues.

2.4. Summary

In summary the role of forward-looking costs in access pricing is three fold and depends on the objective that the regulator is attempting to achieve – as set out in the following table:

Regulatory objective	Access price	Appropriate measure of forward-looking cost
i. Prevent inefficient bypass of the bottleneck	≤	the new entrant's average unit cost of bypass
ii. Prevent stifling of efficient investment in competing infrastructure	≥	the incumbents LRIC of new capacity
iii. Address the legitimate business interests of the incumbent	=	(possibly) scorched node TSLRIC of the incumbent's network

This can also be summarised in the following schematic that shows the relationship between each of these measures of forward-looking cost for a standard bottleneck service (ie, one where increasing returns are present at the existing level of demand).



3. APPLICATION TO SETTING ACCESS PRICES FOR PSTN O/T AND ULLS

This section of addresses a number of specific questions in relation to the application of TSLRIC cost modelling within the PIE II model

3.1. Trench Sharing

Scorched node TSLRIC modelling must first decide what historical facts and decision-making are to be subject to optimisation. As discussed above, the only rational basis on which to make this decision is that of 'prudency'. That is, if a historical decision by Telstra is determined to have been reasonable or prudent at the time (eg, installation of circuit switching technology prior to packet switching technology being available and suitable for carrying voice) then this decision becomes 'protected' from optimisation.

This raises the important question of the level of trench sharing with other utilities. If Telstra's current level of trench sharing with other utilities is 'prudent' then it is appropriate to use this in building a scorched node TSLRIC model. However, if Telstra's current level of trench sharing is not prudent then a decision must be made as to what is a prudent level.

Telstra has used a misconceived interpretation of scorched node TSLRIC to argue that it is appropriate to ignore the fact that housing estate developers have excavated many of the trenches Telstra currently uses and Telstra has not incurred any costs in relation to that excavation. Telstra argues that if it had to hypothetically rebuild the network today it would have to re-excavate the trenches and would incur costs in doing so.

> *That is, Telstra's PIE II model implicitly compensates Telstra not only for costs that were not prudently incurred but for costs that were not incurred at all.*

This is an example of the absurdity of outcomes that can be derived from a TSLRIC modelling process if the purpose of the process is not kept upper most in the modeller's mind. Under Telstra's suggested approach even if Telstra had never excavated a single trench the PIE II model would still compensate them as if they had.

The ACCC correctly pointed out that the scorched node methodology allows consideration of historical levels of sharing to be included in the estimate of TSLRIC costs.

> *"The Commission believes that the scorched-node methodology that is considered appropriate in determining TSLRIC prices dictates that the level of trenching in new estates should reflect both Telstra's past ability to share trenches with utilities in new estates, and its ability*

> *to share over the regulatory period. In contrast, a scorched-earth approach would reflect the level of trenching in new estates in a given year."*[9]

NERA considers that the ACCC's response on this issue is a very good description of the appropriate approach to scorched node TSLRIC cost modeling. In particular, the level of sharing that should be assumed is not dictated by what would occur if the network were rebuilt overnight. (After all, if the network were not already built it probably would not be built – at least not in anything like its current form.) Rather we believe that the appropriate level of trench sharing to assume in scorched node TSLRIC modeling is that which Telstra would prudently have engaged in. This would appear to be entirely consistent with the ACCC's statement that the appropriate level of sharing:

> *"…should reflect both Telstra's* ***past ability*** *to share trenches with utilities in new estates, and its* ***ability*** *to share over the regulatory period."* (Emphasis added)

To the extent that it would be *prudent* to share trenches where Telstra had the *ability* to do so the ACCC and our definition of the appropriate level of sharing is identical. However, we are less inclined to agree with the ACCC's proposed practical implementation of this approach, namely:

> *"The Commission proposes that the PIE II model should reflect the assumption that new estates make up around 13 per cent of Telstra's network. [Based on conservative estimates of the accumulative stock of new estates over the last 10 years.] Subject to further comment from industry, however, the Commission intends to use the remainder of trench sharing assumptions detailed in PIE II model."*

In our view it is inappropriate to use a conservative estimate of the accumulation of new estates over the last ten years. We presume that this approach is based on the objective of removing from Telstra's cost base the cost of trenches which it never incurred – ie, that were wholly paid for by property developers. However, Telstra has had the ability to share other trenches and should prudently have done so to some degree.

While trench sharing is not costless, it would be inappropriate to assume that, for all trenches that are older than 10 years, zero trench sharing represents a prudent investment in the PSTN. Similarly, in relation to investment in the last ten years but outside new estates the Productivity Commission notes that:

> *"There has been significant trench sharing between Foxtel and Telstra,..."*[10]

We note that FOXTEL media release makes the following claim:

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9 Page 30, *Draft Determination for model price terms and conditions of the PSTN, ULLS and LCS services* (June 2003)

10 Telecommunications Competition Regulation Inquiry Report, pg 23.

> *"FOXTEL is delivered directly on cable via Telstra's broadband network which passes 2.5 million homes including most of Brisbane, Melbourne, the Gold Coast and Sydney plus parts of Adelaide and Perth."*[11]

It would appear inappropriate to exclude this form of sharing in a scorched node TSLRIC model. We also note that other services such as broadband delivered using xDSL not only share the trench but also the copper wire in the trench. That is, in rolling out xDSL broadband, Telstra is essentially sharing both the trench and the copper wire with voice services. It would be inappropriate not to take this into account in a true scorched node TSLRIC model.[12]

The issue then becomes how to take account of prudent levels of trench sharing that should have occurred – including prior to the last ten years. In this context we note that this issue has been debated in the context of the US Federal Communications Commission (FCC) forward-looking universal service model. The FCC decided on the following assumptions concerning sharing with other utilities ratios are appropriate.

> *"We adopt the following structure sharing percentages that represent what we find is a reasonable share of structure costs to be incurred by the telephone company. For aerial structure, we assign 50 percent of structure cost in density zones 1-6 and 35 percent of the costs in density zones 7-9 to the telephone company. For underground and buried structure, we assign 100 percent of the cost in density zones 1-2, 85 percent of the cost in density zone 3, 65 percent of the cost in density zones 4-6, and 55 percent of the cost in density zones 7-9 to the telephone company. In doing so, we adopt the sharing percentages we proposed in the Inputs Further Notice, except for buried and underground structure sharing in density zones 1 and 2, as explained below."*[13]

The full text of the FCC's discussion is attached at appendix A. The FCC decision is summarised in the following table:

11 www.foxtel.com.au/about/overview.jsp

12 Indeed, as stated previously, the fact that the main reason the PSTN would be rebuilt today (if indeed it would) is to provide broadband data services is potentially an argument for allocating much of the cost of the network to these services.

13 Para 243, FCC Federal-State Joint Board on Universal Service, CC Docket No. 96-45.

FCC Cost Allocation of Trenches to Telephone Company by Density of Geographic Zone

Density (lines per square km)	Under Ground	Buried
0	100.00%	100.00%
5	100.00%	100.00%
100	85.00%	85.00%
200	65.00%	65.00%
650	65.00%	65.00%
850	65.00%	65.00%
2550	55.00%	55.00%
5000	55.00%	55.00%
10000	55.00%	55.00%

Recommendation:

Assumed prudent trench costs in PIE II should include the historical cost to Telstra of trenches in new estates excavated by developers *and* the prudent ability of Telstra to share other trenches (ie, in addition to those directly paid for in new estates).

3.2. Role for Historic Cost

There are aspects of the PIE II model that are effectively protected from optimisation (such as the choice of copper technology throughout the network – instead of fibre and instead of radio and satellite technology). The first question that must be answered is whether the decision to protect these decisions from optimisation is appropriate. Too much protection from optimisation fails to give incentives for Telstra to operate efficiently and invest prudently. It also causes prices to final consumers to be higher than they otherwise need to be and creates distortions in allocative efficiency.

It is not clear to us, for example, if it is appropriate to assume that all regions in Australia will forever more be served by copper when it is likely that radio and satellite service would be superior. If Telstra continues to be compensated for the costs of copper in rural areas then it will have little incentive to replace it with lower cost alternatives in the long run.

However, if Telstra's historic decisions in this regard are effectively protected from optimisation then it is reasonable to ask:

- what were the historic costs associated with those decisions? and
- to what extent have those historic costs been recovered by past revenues?

For example, if the answer to these questions in relation to the historic cost of trenching and copper in rural areas is that the (unrecovered) cost of historic investments is substantially less than the cost developed in the PIE II model it would be reasonable to substitute historic costs for those costs developed in PIE II.

Put another way, if an unconstrained forward looking model would not put trenches and copper in rural areas then it would be unreasonable for Telstra to recover more than they actually spent on those assets (less the amount they have already recovered). Indeed, this principle could be applied to any asset which is scorched or not optimised in PIE-II.

Recommendation:

Either the costs of trenching and copper in rural areas be replaced by satellite/radio technology in the PIE II model or the ACCC have consideration to their historic costs (and the level of preceding cost recovery) before accepting the PIE II cost estimates.

3.3. Value of Access Deficit Contribution

Implicit in Telstra's application of the TSLRIC model is the assumption that historic costs are irrelevant as are contributions to those costs from other sources. However, as is the case with new estates, this need not be the case. If Telstra did not pay for a trench to be excavated then it is reasonable to take this into account when establishing the value of that trench in a scorched node TSLRIC model. Similarly, if Telstra did pay for a trench to be excavated but has long since recovered the cost of that capital outlay in revenues received from end users then it may also be appropriate to take this into account in a scorched node TSLRIC model.

Telstra's PIE II model establishes a value for the access deficit based on its own estimate of the cost of rebuilding the CAN. However, this is not necessary to signal efficient use or investment in this infrastructure – recovering these costs is primarily to ensure the level of cost recovery associated meets the bottleneck owner's 'legitimate business interests' (section 2). Therefore, a strong argument can be made that scorched node TSLRIC modelling should take into account the depreciated historic cost of those assets not subject to optimisation. That is, assets protected from optimisation should be valued on the actual cost of those assets to Telstra - being the historic capital cost less any recovery of that capital cost. This may be especially applicable to the CAN, which is largely free from optimisation due the fact that copper technology and building placements are fixed in the PIE II model.

The ACCC has undertaken some work to estimate the profitability of the PSTN. It is not clear however, whether this was based on historic costs. If so, this work could reasonably be taken into account when setting the value of the CAN in a TSLRIC model. The ACCC's indicative prices decision appears to remove the access deficit contribution from PSTN O/T access prices by 2006/07 despite the PIE II model predicting the actual access deficit would remain in place until 2009/10. This is somewhat consistent with this approach but appears to scorch the value of the CAN at the time at which the ACCC undertook a TSLRIC calculation in 1999 when assessing Telstra previous PSTN O/T undertaking.

Conclusion:

The ACCC's approach to the calculation of the access deficit is not inconsistent with a scorched node TSLRIC. However, a scorched node TSLRIC modelling could reasonably take into account the depreciated historic cost of those CAN assets not subject to optimisation and satisfy Telstra legitimate business interests.

3.4. Averaging ULLS

As discussed in section 2.1 above, averaging access prices can promote inefficient bypass. Telstra's undertaking averages the network cost of the ULLS over geographic bands 2, 3 and 4. Using this approach Telstra derive a ULLS access price of $40 per month for the three years of the undertaking.

However, the efficient network costs for band 2 are only estimated to be $12 – which is itself an average of costs in those areas with some customers having lower costs. Telstra's proposed undertaking price is around 330 percent of the average network costs of serving these customers – and will be more than that for many customers. This level of averaging significantly increases the probability that inefficient bypass of the CAN will take place for some customers.

Arguably, inefficient bypass of the CAN has already occurred in CBD areas due to the unavailability of the ULLS service at the time in which entrants were competing for customers. This has not occurred to the same degree in metropolitan zones due to higher costs of bypass. Nonetheless, technological change is increasing the potential for bypass of the CAN using wireless and other technologies.[14] Setting access prices substantially above true network costs increases the attractiveness of such bypass – even if the most efficient technology is to use the existing CAN.

[14] See Paul Budde Communications "Global Wireless Broadband Technologies" for a discussion of "fixed wireless broadband used to bypass the incumbent fixed networks".

Recommendation:

The PIE II ULL network costs should not be averaged across geographic zones in establishing ULLS prices.

3.5. Averaging ADC over regions

Telstra's undertaking estimates the access deficit based on the difference between access revenues and PIE II access costs across all zones. This access deficit is then recovered through a per minute/call charge in PSTN O/T access prices irrespective of where those minutes originate/terminate on the network. This is results in a substantial increase in PSTN O/T charges for high density areas (that actually contribute an access surplus) relative to an approach that recovered any access associated with a geographic band from within that geographic band's PSTN O/T access prices.

For the same reasons as discussed in relation to ULLS this form of access pricing increases the probability of inefficient bypass of the PSTN O/T service in high-density areas. In particular, this can be achieved by serving customers directly using ULLS or by bypassing the CAN completely – even if this does not minimise the cost to society of providing these services.

Recommendation:

Consideration of the risk of inefficient bypass of PSTN O/T suggests that, subject to other binding constraints, the access deficit contribution should not be geographically averaged.

APPENDIX A. FCC USO DECISION ON SHARING[15]

D. Structure Sharing

1. Background

241. Outside plant structures are generally shared by LECs, cable operators, electric utilities, and others, including competitive access providers and interexchange carriers. To the extent that several utilities place cables in common trenches, or on common poles, it is appropriate to share the costs of these structures among the various users and assign a portion of the cost of these structures to the telephone company.

242. In the *Inputs Further Notic*e, the Commission tentatively adopted structure sharing values for aerial, buried, and underground structure. Several comments relating to these values were filed in response to the *Inputs Further Notic*e. Both the BCPM and HAI models varied the percentage of costs they assume will be shared depending on the type of structure (aerial, buried, or underground) and line density.861 Commenters differ significantly, however, on their assumptions as to the extent of sharing and, therefore, the percentage of structure costs that should be attributed to the telephone company in a forward-looking cost model.

2. Discussion

243. We adopt the following structure sharing percentages that represent what we find

is a reasonable share of structure costs to be incurred by the telephone company. For aerial structure, we assign 50 percent of structure cost in density zones 1-6 and 35 percent of the costs in density zones 7-9 to the telephone company. For underground and buried structure, we assign 100 percent of the cost in density zones 1-2, 85 percent of the cost in density zone 3, 65 percent of the cost in density zones 4-6, and 55 percent of the cost in density zones 7-9 to the telephone company. In doing so, we adopt the sharing percentages we proposed in the *Inputs Further Notic*e, except for buried and underground structure sharing in density zones 1 and 2, as explained below.

244. Commenters continue to diverge sharply in their assessment of structure sharing. As noted by US West, "[s]ince forward-looking sharing percentages for replacement of an entire network are not readily observable, there is room for reasonable analysts to differ on the precise values for those inputs." While commenters engage in lengthy discourse on topics such as whether the model should assume a "scorched node" approach in developing structure sharing values, little substantive evidence that can be verified has been added to the debate. AT&T and MCI contend that the structure sharing percentages proposed in the *Inputs Further Notice* assign too much of the cost to the incumbent LEC and fail to reflect the greater potential for sharing in a forward-looking cost model. In contrast, several commenters contend that the proposed values assign too little cost to the incumbent LEC and reflect unrealistic opportunities for sharing. In support of this contention, some LEC commenters propose alternative values that purport to reflect their existing structure sharing percentages, but fail to substantiate those values. SBC, however,

[15] FCC Federal-State Joint Board on Universal Service, CC Docket No. 96-45.

claims that the structure sharing percentages we propose reflect its current practice and concurs with the structure sharing values that we adopt in this Order.

245. More than with other input values, our determination of structure sharing percentages requires a degree of predictive judgement. Even if we had accurate and verifiable data with respect to the incumbent LECs' existing structure sharing percentages, we would still need to decide whether or not those existing percentages were appropriate starting points for determining the input values for the forward-looking cost model. AT&T and MCI argue that past structure sharing percentages should be disregarded in predicting future structure sharing opportunities. Incumbent LEC commenters argue that sharing in the future will be no more, and may be less, than current practice.

246. In the *Inputs Further Notic*e, we relied in part on the deliberations of a state commission faced with making similar predictive judgment relating to structure sharing The Washington Utilities and Transportation Commission, conducted an examination of these issues and adopted sharing percentages similar to those we proposed.

247. In developing the structure sharing percentages adopted in this Order, we find the sharing percentages proposed by the incumbent LECs to be, in some instances, overly conservative. While we do not necessarily agree with AT&T and MCI as to the extent of available structure sharing, we do agree that a forward-looking mechanism must estimate the structure sharing opportunities available to a carrier operating in the most-efficient manner. As discussed in more detail in this Order, the forward-looking practice of a carrier does not necessarily equate to the historical practice of the carrier. Given the divergence of opinion on this issue, and of AT&T and MCI's contention that further sharing opportunities will exist in the future, we have made a reasonable predictive judgment, and also anticipate that this issue will be revisited as part of the Commission's process to update the model in a future proceeding.

248. In the 1997 *Further Notic*e, the Commission tentatively concluded that 100 percent of the cost of cable buried with a plow should be assigned to the telephone company. In the *Inputs Further Notic*e, we sought comment on the possibility that some opportunities for sharing existed for buried and underground structure in the least dense areas and proposed assignment of 90 percent of the cost in density zones 1-2 to the telephone company. Several commenters contend that there are minimal opportunities for sharing of buried and underground structure, particularly in lower density areas. In addition, several commenters contend that, to the extent sharing is included in the RUS data, it is inappropriate to count that sharing again in the calculation of structure cost. While we agree that structure sharing should not be double counted, we note that the RUS data includes little or no sharing of underground or buried structure in density zones 1-2. This does, however, support the contention of commenters that there is, at most, minimal sharing of buried and underground structure in these density zones. We therefore modify our proposed input value in this instance and assign 100 percent of the cost of buried and underground structure to the telephone company in density zones 1-2.

249. We believe that the structure sharing percentages that we adopt reflect a reasonable percentage of the structure costs that should be assigned to the LEC. We note that our conclusion reflects the general consensus among commenters that structure sharing varies by structure type and density. While disagreeing on the extent of sharing, the majority of commenters agree that sharing occurs most frequently with aerial structure and in higher density zones. The sharing values that we adopt reflect these assumptions. SBC also concurs with our proposed structure sharing values. In addition, as noted above, the Washington Utilities and Transportation Commission has adopted structure sharing values that are

similar to those that we adopt. We also note that the sharing values that we adopt fall within the range of default values originally proposed by the HAI and BCPM sponsors.