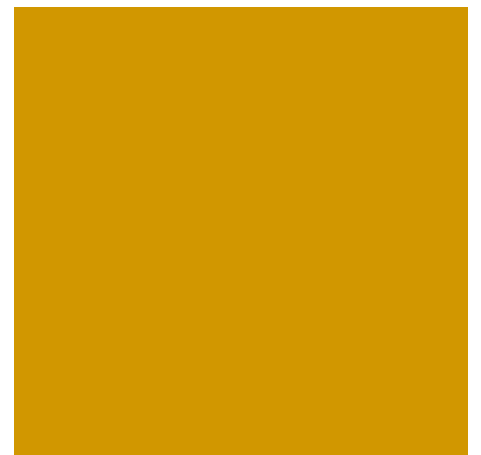


# Analysis of extent of transmission tail deployment in metropolitan ESAs— PUBLIC version—FINAL

Author: Mike Smart  
Date 20 August 2008



## **About LECG**

LECG is a global expert services firm with highly credentialed experts and professional staff with specialist knowledge in regulation, economics, financial and statistical theories and analysis, as well as in-depth knowledge of specific markets and industries. The company's experts provide independent testimony, original authoritative studies and strategic advice to both public and private sector clients including legislative, judicial, regulatory, policy and business decision-makers.

LECG is listed on the NASDAQ Stock Exchange and has approximately 1000 experts and professional staff worldwide. These experts are renowned academics, former senior government officials, experienced industry leaders and seasoned consultants.

### **SYDNEY**

Darling Park Tower 2  
Level 20, Suite 2032  
201 Sussex Street  
GPO Box 220  
SYDNEY NSW 2000  
Ph: (61 2) 9221 2628  
Fax: (61 2) 9006 1010

### **For information on this report please contact:**

Name: Mike Smart  
Telephone: 612 9221 2628  
Mobile: 61 407 246 646  
Email: [msmart@lecg.com](mailto:msmart@lecg.com)

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# 1 Introduction

My name is Michael Smart. I have previously prepared a report in connection with Telstra's 21 December 2007 applications for exemption from the DTCS declaration of inter-exchange and tail-end transmission in certain exchange service areas.<sup>1</sup> My experience and qualifications are set out in Appendix 1.

On 30 July 2008, I prepared a statement in reply to submissions made by Optus, Internode, AAPT and Pipe Networks.<sup>2</sup> That statement considered, inter alia, the extent of fibred buildings within band 1 ESAs over which DTCS exemption had been sought by Telstra.

Since my 30 July 2008 statement was completed, I have become aware of new information on the number of buildings in band 2 ESAs that are connected to Telstra fibre. With this information, submissions by Optus<sup>3</sup> and Internode<sup>4</sup> can now be assessed on a factual basis insofar as they pertain to Telstra's perceived dominance in metropolitan non-CBD fibre tails.

The structure of this submission is as follows. First I set out the relevant claims made by Optus and Internode. Second I summarise the new information pertaining to the count of buildings fibred by Telstra in band 2 ESAs. Then I perform quantitative analysis of this new data in order to test the claims made in those submission. The final section concludes.

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<sup>1</sup> Statement of Michael Smart of CRA International on the economic considerations for Metro and CBD domestic transmission capacity service exemptions, submitted to ACCC on December 2007.

<sup>2</sup> *"Points in reply to submissions by Optus, Internode, PIPE and AAPT on Telstra's DTCS exemption applications for CBD/Metro IEN and tail transmission,"* Michael Smart, submitted to ACCC on 30 July 2008.

<sup>3</sup> Optus submission to ACCC on Telstra's December 2007 exemption applications for tail end and inter-exchange transmission capacity services, April 2008.

<sup>4</sup> "Telstra's Transmission Exemption Application – Submission by Internode."

## 2 Submissions concerning metro tails

A consistent theme of the Optus and Internode submissions is a perception that Telstra possesses a near-ubiquitous portfolio of fibre-based tail end transmission assets in CBD and metro ESAs across Australia. For example, Internode states, *“We are not aware of any provider except Telstra that has anything close to the ubiquitous network build required to provide tail-end services in either CBD or metro ESAs.”*<sup>5</sup> Internode claims, further, that *“Telstra remains the dominant provider in all these areas [being CBD IEN, CBD tails, metro IEN, metro and regional tails.]”* *“As the ubiquitous incumbent, Telstra enjoys a significant advantage over other carriers in accessing buildings.”*<sup>6</sup>

The relevance of this perception is that the natural monopoly rationale for continued declaration depends on it, as does the primary objection to ULLS as a substitute for fibre tails up to 2 mbps.

The argument in favour of continued declaration of metro tail transmission depends heavily on this perception. Optus claims, *“The high cost of building access fibre infrastructure is a significant barrier to entry in tail-end transmission capacity and there are many buildings to which it will never be economically feasible for multiple operators to build access fibre.”* *“Further, even if some investment in tail-end transmission was stimulated, such investment would represent inefficient, costly duplication of natural monopoly infrastructure.”*<sup>7</sup>

Optus refers in those quotations to a natural monopoly justification for continued regulation of tail-end transmission. If it were uneconomic for more than one carrier to build a fibre tail to a given building,<sup>8</sup> and if Telstra had already installed fibre to a majority of buildings in each ESA, then the burdensome machinery of regulation might be justified. This conclusion would not be valid, however, if the second part of the premise were incorrect.

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<sup>5</sup> Internode submission, answer to question 2.

<sup>6</sup> Internode submission, answer to question 3.

<sup>7</sup> Optus confidential submission, par. 1.6.

<sup>8</sup> This assertion by Optus is not made out through any empirical analysis. There are several possible cases in which it would be economic for multiple carriers to run fibre to a particular building. Multiple carriers bring benefits in the form of fault tolerance and the ability of the transmission customers to obtain better prices by bargaining with the tail end providers. In some circumstances these benefits would outweigh the cost of duplicating infrastructure.

Workable competition is possible in services for which each customer premise can only be served by one firm. It is only when one supplier has an overwhelming advantage in its installed base of customers that regulatory intervention might be required for such services. There are many examples of competition between providers of services for which each end user tends to select a single supplier over a prolonged subscription period. They include electricity and gas retail, newspaper deliveries, long distance and mobile phone service, internet service, and banking services. Most of these services are not subject to price regulation. In the case of gas and electricity retailing, it is the emergence of this type of contestability that has enabled retail price regulation to be rolled back.<sup>9</sup>

The argument mounted by Optus against the viability of ULLS as a substitute to fibre for tail transmission service of up to 2 mbps also depends on this presumption of Telstra's near-ubiquitous provision of fibre tails in metro ESAs. Optus states,

*“The ULLS cannot necessarily provide equivalent bandwidth to the DTCS, which provides a guaranteed speed of at least 2 Mbps. This is because ULLS quality/speed of service for data deteriorates as the copper line travels further from the exchange. Only 60% of Band 2 services are close enough to the exchange to receive a 2 Mbps service (and this is assuming away issues with copper pairs, copper quality, exchange capacity and pair gain). The remaining 40% of Band 2 services are restricted by distance limitation from receiving a service with DTCS-equivalent bandwidth.”*<sup>10</sup>

Optus implies that ULLS is an unsatisfactory substitute for fibre because, on average, 40% of end users in a Band 2 ESA will be unable to obtain 2 mbps tail transmission service over ULLS. The unstated premise of this criticism is that Telstra fibre tails are available to that 40% group of end users. The conclusion Optus seeks to draw is that removal of declaration would leave that 40% group of end users with no alternative but to buy fibre tail transmission from Telstra at unregulated prices.

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<sup>9</sup> Full retail contestability for electricity and gas has been progressively taken up in Australian states since 2003. The present situation in most of these states is that retail electricity prices to larger customers (those using 160 MWh per year or more) are unregulated. Smaller electricity customers are able to negotiate a market contract with a retailer, but have the option of relying instead on a standing offer, the price of which is effectively regulated. For gas customers, the threshold of regulation is consumption of 1 TJ per year. Again, retail pricing to larger customers is unregulated. Retail pricing should not be confused with prices for electricity and gas distribution networks (DUOS charges). The latter are regulated, owing to the natural monopoly status of the gas and electricity distribution networks, which have ubiquitous coverage of their service areas.

<sup>10</sup> Optus confidential submission, par. 3.19.

In fact, as I demonstrate in section 4 below, the number of Telstra fibre tails presently installed is insufficient to serve more than a small proportion of those end users who are situated too far from the exchange to obtain 2 mbps transmission over ULLS. That is not to say that the installed fibre tails would necessarily be capable of meeting this need. They could well be built in areas close to the exchange. Wherever the existing fibre tails are built, however, the vast majority of end users that cannot use ULLS for 2 mbps tail service do not have a Telstra fibre alternative.

### 3 Summary of buildings fibred data

I refer to the statement dated 20 August 2008 of [Telstra employee], and the accompanying spreadsheet which presents the count of building termination points connected by fibre in each ESA. [Author] notes (p.1) that “*The existence of a building termination point in a building means that the building is connected by Telstra’s fibre network infrastructure.*” In what follows, I have restricted my attention to those band 1 and 2 ESAs in NSW and Victoria that have 3 or more IEN fibre owners.<sup>11</sup>

This new information provides the first piece of insight into the extent of Telstra fibre tail deployment in band 2 ESAs. For the first time it is possible to perform an empirical assessment of the Optus and Internode claims about the supposed ubiquity of Telstra tail transmission fibre in metro ESAs.

The building count for NSW band 1 and band 2 ESAs is presented in the chart below in the form of a cumulative probability density function (CDF). This chart displays the number of Telstra building termination points connected by fibre in an ESA on the horizontal axis. It uses the vertical axis to display the percentile of ESAs that have a number of building termination points that is fewer than the value on the x-axis.

The chart was constructed by creating a list of all NSW band 1 and band 2 ESAs with 3 or more IEN fibre owners, then sorting this list in order of increasing number of building termination points. This sorted list of points was graphed (number of building termination points on the x-axis and rank order on the y-axis), and a scale from 0 to 100 was applied to the y-axis. Each point on the cumulative density curve corresponds to a

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<sup>11</sup> I selected these ESAs with reference to the following two reports from Market Clarity:

“Access Fibre Availability, Transmission Services, and Inter-Exchange Network Connectivity,” dated 19 December 2007.

“Victorian Access Fibre Availability and Inter-Exchange Network Connectivity,” dated 14 August 2008.

particular number of buildings fibred by Telstra in one ESA, and a particular percentile of ESAs that do not exceed that number of buildings.

[Chart C-I-C]

The most intensely connected NSW ESA had only [C-I-C] buildings fibred by Telstra. Approximately 90% of the [C-I-C] NSW band 1 and band 2 ESAs had fewer than [C-I-C] Telstra fibre connections. 75% of ESAs had fewer than [C-I-C] connections, and 50% had fewer than [C-I-C]. Each of these ESAs has thousands of end user premises (identified as customers of POTS SIOs). In the vast majority of cases, each ESA had more than 10,000 POTS SIOs. The number of buildings fibred by Telstra in each of these ESAs is a small fraction of the number of POTS SIOs in that ESA.

The building count for Victorian band 1 and band 2 ESAs is presented as a CDF in the chart below.



[Chart C-I-C]

The most intensely connected Victorian ESA had only [C-I-C] buildings fibred by Telstra. Approximately 90% of these [C-I-C] band 1 and band 2 ESAs had fewer than [C-I-C] Telstra fibre connections. 80% of ESAs had fewer than [C-I-C] connections, and 50% had fewer than [C-I-C]. Each of these ESAs has thousands of POTS SIOs. In the majority of cases, each ESA had more than 10,000 POTS SIOs. As with NSW, in Victoria the number of buildings fibred by Telstra in each of these ESAs is a small fraction of the number of POTS SIOs in that ESA.

This finding does not support the claim made by Optus and Internode that Telstra has near-ubiquitous fibre tail reach in band 2 ESAs. In fact, it creates substantial doubt over the extent of Telstra's first-mover advantage in installing fibre tails in any one of these ESAs. Clearly, the end user premises that do not have a Telstra fibre tail connection vastly outnumber those that do in every one of these NSW and Victorian ESAs.

## 4 Interpretation of count of buildings fibred

The Optus claim that ULLS provides a poor substitute for fibre tails can also be examined empirically with this data. I understand that Optus is correct in saying that some end user premises cannot obtain 2 mbps transmission tail service over ULLS because the copper loop to the exchange is too long.<sup>12</sup> Using data previously cited,<sup>13</sup> it is possible to calculate the approximate number of POTS SIOs in each ESA that are capable of receiving a 2 mbps tail service over ULLS. This number can be compared to the number of buildings fibred by Telstra in each ESA. The comparison is presented in the table below.

[Table C-I-C]

NSW and Victorian ESAs are combined in the table above. For each ESA, the number of POTS SIOs potentially able to receive 2 mbps tail service over ULLS is calculated by multiplying the number of POTS SIOs in the ESA by the percentage of copper services in that ESA meeting ULLS deployment class 9f. The second-last column is the ratio of the number of POTS SIOs capable of receiving 2 mbps tails over ULLS to the number

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<sup>12</sup> My December 2007 statement specifically cited analysis identifying the proportion of copper-based SIOs in each ESA that could support ULLS deployment class 9f (which is the standard required for 2 mbps transmission). See [Telstra employee] statement dated 18 December 2007 (ULLS class 9f deployment class).

<sup>13</sup> Numbers of POTS SIOs and ULLS SIOs were derived from [Telstra employee] statement dated 27 May 2008 (POTS and ULLS SIOs – submitted in LCS/WLR exemption application).

of buildings fibred by Telstra. The rows are sorted in increasing order for that ratio. For simplicity, the table is truncated at a ratio of about 50. The maximum ratio was above 5,000 and there were [C-I-C] of the [C-I-C] ESAs that had a ratio higher than 50.

This table shows that a much greater number of 2 mbps transmission tails could potentially be served by ULLS than could be served by Telstra fibre in each of these ESAs, notwithstanding the limitations of distance on 2 mbps transmission over copper pairs.

Turning to the premise implicit in Optus' argument that end users who cannot receive 2 mbps transmission over ULLS would be obliged to buy fibre tails from Telstra, the tables below reorganise the data presented above to provide a comparison between the number of POTS SIOs in each ESA that cannot receive 2 mbps over ULLS and the number of buildings fibred by Telstra.

The comparison is presented first for the band 1 ESAs in Sydney and Melbourne. This table includes band 2 ESA [ESA name] because 100% of its POTS SIOs are capable of supporting 2 mbps transmission over ULLS.

[Table C-I-C]

For these band 1 ESAs, ULLS would be capable of supporting 2 mbps to virtually all end user premises that have a POTS SIO. For those band 1 ESAs that have some POTS SIOs that could not get 2 mbps over ULLS, the number of Telstra fibre tails is less than half the number that would be needed to serve them. In any case, as I showed in my December 2007 report, installation of new fibre tails in band 1 areas has a short payback period, so any deficiency in ULLS could be remedied with new fibre construction by either Telstra or an entrant.<sup>14</sup>

The comparison is presented next for the band 2 ESAs in the table below.

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<sup>14</sup> My December 2007 statement analysed the barriers to entry for tail-end fibre in band 1 ESAs, finding that they were low and that actual entry was widespread.

[Table C-I-C]

Leaving aside the band 1 ESAs and [ESA name], the number of buildings fibred by Telstra is insufficient to provide a fibre alternative for the POTS SIOs that cannot receive 2 mbps service over ULLS. The lowest ratio of ULLS-deficient premises to buildings fibred by Telstra is [C-I-C] (as seen in the last column). The rows are sorted in increasing order of this ratio. The table was truncated at a ratio of 50.

There is simply not enough Telstra fibre installed in these band 2 ESAs to meet the needs of end users who are too far from the exchange to receive 2 mbps service over ULLS, even if the existing fibre tails were installed in the right locations to serve them.

## 5 Conclusions

Some caution should be exercised in the interpretation of this data. Given the limitations on the data available, it has not been possible to distinguish between business and residential premises. Also, some buildings with fibre connections may host multiple tenants, so there is not necessarily a one-for-one relationship between buildings fibred and transmission tail customers. Nevertheless, in my view, the findings are sufficiently clear on three particular matters raised in the submissions of Optus and Internode.

First, Telstra's fibre tail coverage is not ubiquitous in metropolitan areas. Second, Telstra's first-mover advantage in fibre tail construction in metro areas has been exaggerated by the submitters. It would not require construction of a large number of fibre tails for a new entrant to achieve Telstra's current scale in any single band 2 ESA.

Third, the shortcomings of ULLS as a means of providing for 2 mbps tail transmission do not necessarily translate into enhanced market power for Telstra in fibre tail transmission. The foregoing data and analysis has shown that what fibre Telstra does have in place is insufficient to provide the number of tail services that ULLS fails to deliver.

## Appendix 1: qualifications and experience

### MIKE SMART, CONSULTING DIRECTOR, LECG

LECG Ltd  
Darling Park, Tower 2  
Suite 2026, Level 20  
201 Sussex Street  
GPO Box 220  
Sydney NSW 2001  
Australia  
Phone: +61 (0) 2 9006 1240  
Mobile: +61 (0) 4 0724 6646  
Email: [msmart@lecg.com](mailto:msmart@lecg.com)

### BIO/SUMMARY

Mike Smart, based in Sydney, works primarily in competition economics and business strategy. He applies empirical economics to pricing, corporate strategy, regulatory and competition policy issues. He has advised the Australian industry leaders in rail, telecommunications, logistics, gas, mining, electricity and aviation, among other private and public sector organisations. Mike's advice includes the preparation of reports, submissions, board papers, financial models, and testimony. Mike has given expert evidence in the Federal Court of Australia and the Australian Competition Tribunal.

Prior to joining LECG in March 2008, Mike was a Vice President of CRA International and an executive director of the Network Economics Consulting Group (NECG). Before joining NECG, Mike was the Manager of Corporate Strategy for the Rail Access Corporation of NSW during its corporatisation and first three years of operation. That role encompassed commercial and regulatory challenges including development of an access pricing strategy and negotiating access contracts, as well as a significant contribution to the development of the NSW Rail Access Regime.

Prior to that role, Mike advised the Public Accounts Committee of the NSW Parliament, worked as engineering manager in a data acquisition and machine vision firm, and consulted, in California, to the airline and electric power industries.

Mike is a member of the Trade Practices Committee of the Business Law Section of the Law Council of Australia.

## EDUCATION

BA Magna Cum Laude (Astrophysics), Harvard University 1979

## PRESENT POSITION

LECG Limited, Consulting Director, 2008

## PROFESSIONAL EXPERIENCE

- Authored an expert report in the matter of an application by East Australian Pipeline Limited [2005] ACompT 1, heard by the Australian Competition Tribunal, Sydney.
- Testified before the Australian Competition Tribunal in the matter of an Application by Virgin Blue Airlines Pty Limited, No 1 of 2004, Sydney.
- Testified before the Federal Court of Australia in the matter of Australian Gas Light Company v. Australian Competition & Consumer Commission (No 3) [2003] FCA 1525, Melbourne.
- Prepared a quantitative assessment of the external benefits generated by urban rail transport in Sydney.
- Assisted NSW competition regulator IPART in its inquiry into the Port Botany land transport interface (Final report published March 2008).
- Co-authored, with Professor George Hay, an expert report concerning competition impacts of a merger in the plastic bottle industry.
- Provided expert statements to the ACCC regarding applications by Telstra for exemption to declaration for urban, metropolitan and regional transmission capacity services.
- Briefed counsel for the Australian Pipeline Trust in a High Court challenge to the ACCC's Final Decision on the access arrangements for the Moomba – Sydney Pipeline.
- Assisted FOXTEL in obtaining ACCC approval (granted March 2007) for its special access undertaking for its digital set top units.
- Advised IPART on its review of actual coal rail access revenues against the statutory ceiling.
- Provided economic reports in support of the asset valuation for the Roma-Brisbane Pipeline in the 2006-2007 Access Arrangement round.
- Led a team analysing the regulatory test hurdles for a proposed reinforcement investment in the electricity transmission network for WesternPower.
- Assisted AGL to obtain regulatory approval for the acquisition of certain Queensland retail energy business assets.

- Prepared reports submitted to the National Competition Council on behalf of BHP Billiton Iron Ore concerning the Part IIIA application by Fortescue Metals Group to have the Mt Newman railway line declared.
- Assisted in the preparation of expert testimony called by Pacific National in a Federal Court case concerning disputed management and occupancy of the Acacia Ridge rail terminal in Brisbane.
- Worked in a team modelling the competition impacts of the (now approved) merger between Toll Limited and Patrick Corporation.
- Advised a New Zealand firm on potential damages arising from alleged collusive pricing.
- Prepared expert reports submitted to the Australian Competition Tribunal in the merits review of the ACCC's Final Decision on the Moomba-Sydney Pipeline Access Arrangements.
- Worked closely with the Australian Stock Exchange to develop and test options for the strategic review of trading, clearing and settlement prices, culminating in the December 2005 announcement of significant restructuring of prices.
- Expert witness called by Qantas in Virgin's appeal to the Australian Competition Tribunal to have Sydney Airport's airside service declared.
- Conducted a series of imputation tests used in expert testimony in the s46 case brought against Baxter by the ACCC in the Federal Court in Sydney.
- Expert witness called by AGL in its successful court action against the ACCC regarding the purchase of the Loy Yang A power station.
- Assisted the Australian Pipeline Trust by preparing numerous submissions in regard to its campaign to have regulatory coverage of the Moomba-Sydney Pipeline revoked.
- Provided a detailed avoidable cost analysis for an Australian firm responding to allegations of predatory pricing. The ACCC ultimately did not proceed with the case.
- Prepared revenue forecasts and other due diligence reports for Toll Holdings and Patrick Corporation on access prices in their successful bid to acquire Pacific National.
- Assisted in the preparation of expert testimony on behalf of the Coal Compensation Board with respect to a disputed compensation claim in the Coal Compensation Tribunal.
- Prepared a pricing strategy for Airservices Australia concerning the intellectual property embedded in its published aeronautical data.
- Helped the Australian Stock Exchange to design and establish pricing for a new data service.
- Prepared due diligence report on regulatory risk for one of the underbidders for Sydney Airport in 2002.



- Assisted in the preparation of expert testimony on behalf of Duke Energy with respect to their successful action before the Australian Competition Tribunal to have the Eastern Gas Pipeline unregulated.
- Advised the ACCC on a method for valuing the land under Sydney Airport. The recommendations were adopted by the ACCC in the 2000 Sydney Airport decision on aeronautical charges.
- Additionally, Mike has prepared a number of economic reports regarding merger authorisations, declarations under Part IIIA of the Trade Practices Act, matters involving misuse of market power, commercial pricing strategies, and regulatory pricing decisions.

### OTHER POSITIONS HELD

2005 – 2008	Vice President, CRA International
2000 – 2005	Executive Director, NEEG, Australia
1996 – 2000	Manager, Corporate Strategy and Manager of Systems, Rail Access Corporation of NSW, Australia
1993 – 1996	Director, Smart & Kay Pty Ltd, Australia
1989 – 1993	Independent Consultant, Australia
1986 – 1989	Engineering Manager, Science & Computing Applications P/L, Australia
1984 – 1985	Associate, Decision Focus Inc, Los Altos, CA (USA)
1980 – 1983	Professional Officer, University of NSW, Australia

### PUBLICATIONS

“*Value of CityRail externalities and optimal Government subsidy*”, Mike Smart, Report commissioned by the Independent Pricing and Regulatory Tribunal of NSW, June 2008. <http://www.ipart.nsw.gov.au/files/CRAI%20report%20-%20CityRail%20Externalities%20-%20June%202008.PDF>

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