



*Australia's Source for Telecommunications Intelligence*

## Telecommunications Fibre Backhaul Infrastructure Summary for Selected Routes

Prepared for Mallesons Stephen Jaques

**Version 1.0**

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## Contents

Report License .....	3
1 Methodology.....	4
1.1 About This Report .....	6
1.1.1 Data Accuracy .....	7
1.1.2 Distance Calculation .....	7
2 Competitive Presence of Backhaul Infrastructure .....	8
Appendix 1 Instructions.....	11

## Tables

Table 1. — Fibre-Based Telecommunications Backhaul Infrastructure .....	9
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## 1 Methodology

Market Clarity has conducted an assessment of fibre backhaul infrastructure on behalf of Mallesons Stephen Jaques for selected routes.

In this section, we describe the methodology used to compile this assessment.

Market Clarity has compiled what is arguably Australia's most extensive independent database of telecommunications infrastructure. The development of this SQL-driven **Telecoms Infrastructure Database (IDB)** has been a core business activity for Market Clarity since the firm was established in January 2006.

With the **Telecoms IDB**, Market Clarity has built an inventory of Australia's telecommunications transmission infrastructure, covering such diverse technologies as DSLAM deployment, fixed wireless broadband base stations, HFC networks, mobile base station locations, optical fibre access networks, long-haul fibre, and point-to-point microwave systems.

Market Clarity's comprehensive database of telecommunications infrastructure tracks information from 118 infrastructure owners:

- DSLAM Locations (close to 4,500 DSLAMs) — 19 Owners
- Access Fibre Networks (more than 700 service areas and 1,530 POPs) — 25 Owners
- Fixed Wireless Broadband Base Stations (close to 2,030 base stations) — 67 Owners
- Mobile Networks (Over 17,000 2G and 3G base stations) — 4 Owners
- Long-Haul Fibre Networks (200+ towns served by long-haul links, over 550 POPs) — 13 Owners
- HFC Networks (close to 270 service areas) — 4 Owners
- Long-haul Microwave (over 9,200 base stations) — 30 Owners
- Wireless Hotspots (over 1,600 base stations) — 13 Owners
- Academic Networks (over 180 network POPs) — 5 Owners
- Data Centres (close to 120 data centre locations) — 88 Owners
- Internet Peering Points (over 290 peering point locations) — 20 Owners

- Fibre-to-the-Node Networks (over 100 Node locations) — 1 Owner

Market Clarity has over 200,000 specific pieces of information in its **Telecoms Infrastructure Database** including:

- **Infrastructure by Type** — DSLAMs, Fibre, Fixed Wireless Broadband, Mobile, and Fixed Microwave
- **Infrastructure by Owner** — Ownership information for each type of infrastructure
- **Infrastructure by Location** — The location of all infrastructure can be queried by ABS (Australian Bureau of Statistics) geographical divisions such as State, Statistical Division (region), Statistical Subdivision, Statistical Local Area (suburb), and by Exchange name (for DSL). Where appropriate (for example, with fixed wireless base stations), this is supplemented with latitude and longitude.
- **Demography by Location** — Relating ABS demographic data with telecommunications infrastructure.

Market Clarity's **Geographic Mapping** tools enable the mapping of infrastructure presence against geographic and demographic data, providing information such as:

- The number of infrastructure owners in a region
- The types of infrastructure in a region
- Correlation between backhaul and access networks
- The relationship between infrastructure and population

Market Clarity's **Telecoms IDB** is constantly updated to keep track with the fast pace of technology rollout in the Australian market.

Whenever Market Clarity learns of infrastructure investment plans, this information is tagged as pre-launch, and tracked in a separate pre-launch database, where Market Clarity is also tracking FTTH developments across Australia, as well as BPL trials. As this infrastructure is made available for commercial service additional categories for FTTH and BPL (Broadband over Power Lines) access will be added to the **Telecoms IDB**.

Similarly, Market Clarity is also tracking developments in the WiMAX space. To date, WiMAX deployments are using 802.16d (fixed WiMAX) purely as an access technology, and these investments are covered in the Wireless Access category. As WiMAX is offered in mobile form (802.16e) this will be separately tracked, as will any WiMAX-based backhaul infrastructure deployment.

The information contained in Market Clarity's **Telecoms Infrastructure Database** was compiled via primary research:

- The initial compilation of the **Telecoms Infrastructure Database** utilised a wide range of research sources, including Market Clarity service provider databases, service provider annual reports, service provider presentations, ACMA Radiocomm licenses, news articles, press releases, and services maps. Market Clarity also reviewed published industry studies by DCITA, ACMA, the ACCC, and state and local governments for additional information.
- This information was supplemented with primary research wherein Market Clarity contacted infrastructure owners and requested their latest fibre maps, DSLAM locations, and so on. This is a core part of Market Clarity's ongoing research activities.
- Telecommunications assets from utilities such as electricity and rail operators are also tracked in this database, to the extent that this infrastructure is available for third-party wholesale access or is used to provide an external telecommunications service. Note: Our initial focus has been on telecommunications sector transmission infrastructure, and we are gradually adding information from utilities.
- Infrastructure owner websites are checked on a monthly basis, to see whether any new service locations have been added. We also contact DSLAM infrastructure owners on a regular basis to obtain their latest list of DSLAM locations. We regularly contact Tier 1 and Tier 2 carriers via phone or email to ask questions about their services, and this too provides us with infrastructure updates.
- In addition to primary research, we receive press releases from a wide range of organisations and subscribe to industry newsletters, magazines, and so on, where we also learn of new service launches, which we then investigate.
- The service provider community has embraced this innovative resource, and as a result Market Clarity is regularly provided with infrastructure updates, and permission to utilise the information in the **Telecoms IDB**.

## 1.1 About This Report

In this report, Market Clarity provides information on the presence of fibre backhaul infrastructure in selected locations in Australia. This report was compiled at the request of Mallesons Stephen Jacques according to the instructions which appear as Appendix 1 to this report.

To conduct this analysis, Market Clarity used the following source data:

- **Point of Interconnect Locations** — Telstra point of interconnect (TPOI) locations were provided by Telstra.
- **Post Office Locations** — The address of the post office associated with the TPOI was sourced from Australia Post, as described in Section 1.1.1, below.

- **Fibre Infrastructure** — Market Clarity used data held in its *Telecommunications Infrastructure Database* to provide location information for backhaul fibre infrastructure (as determined by the availability of a fibre POP).
- **Route Distance** — Telstra provided the distance between each capital city and regional location, based upon the road distances between the two (2) locations. Market Clarity then reviewed these distances against other similar sources.
- **Radius** — For any given route, the radial distance was set to 5% of the route distance. This value was then used to assess the availability of fibre-based telecommunications backhaul infrastructure within the radius as measured from the **Post Office Location**.

## 1.1.1 Data Accuracy

Calculations of distance are based on the latitude and longitude coordinates for a given infrastructure item relative to the post office in the regional centre.

Wherever possible, Market Clarity identifies the location of fibre-based infrastructure down to street address level. Where this is not possible, Market Clarity uses location latitude and longitude data contained in the Gazetteer of Australia, 2006 edition, published by Geosciences Australia.

Post office locations were obtained from Australia Post. Where a regional zone has more than one Australia Post location in the same town (for example, where a town is served by multiple Post Shops), Market Clarity has based its calculations on the location identified by Australia Post as being nearest the town centre. Australia Post operating locations are published on behalf of Australia Post by the Web site <http://www.nowwhere.com.au>.

## 1.1.2 Distance Calculation

Distances between infrastructure POPs (points-of-presence) and Australia Post locations were calculated using the open-source *v.distance* tool in *Grass\_GIS*, the geographic information system (GIS) used by Market Clarity, which provides tools for calculating distances between points in large data sets. These calculations were then manually checked against infrastructure maps from relevant long-haul fibre owners.

Distance from the post office to fibre infrastructure POPs was compared to a **radial distance** as specified by Telstra. For any given route, the radial distance used for Market Clarity's calculations was 5% of the route distance.

The analysis then identified the number of telecommunications infrastructure owners (including Telstra) with fibre POPs located within the specified **radial distance** for each town's nearest post office.

## 2 Competitive Presence of Backhaul Infrastructure

Table 1, below, presents the outcomes of Market Clarity's analysis. The fields in this table have the following meanings:

- **Capital City** — The capital city from which Telstra serves the regional centres listed in this table.
- **Regional Centre** — The regional centre in which a Telstra Point of Interconnect (TPOI) exists.
- **State** — The state in which the regional centre is located.
- **Distance from Capital City to Regional Centre (Km)** — The road distance, in kilometres, of the backhaul route between the capital city and the regional centre, supplied by Mallesons Stephan Jacques.
- **Radius** — 5% of the distance between the capital city and the regional centre.
- **Post Office Name** — The name of the Australia Post Office in the regional centre. Where a regional centre is served by more than one location, this is the post office nearest to the centre of town.
- **Post Office Address** — The street address of the Australia Post Office in the regional centre. Where a regional centre is served by more than one location, this is the post office nearest to the centre of town.
- **Number of Fibre Owners within Radius Distance of Post Office** — The number of fibre owners, including Telstra, known to have Points of Presence (POPs) within the radial distance (radius), using the nearest Post Office as the centre of the radius.

**The data set used as the basis of the Telecoms Fibre Backhaul Infrastructure Summary for Selected Routes report was compiled in August 2007. As such, the information in this report necessarily reflects a snapshot point in time.**

**All of the routes supplied by Mallesons Stephen Jaques were checked against Market Clarity's Telecoms IDB and infrastructure maps to confirm the presence of telecommunications infrastructure covering those routes, including Telstra's fibre infrastructure.**

**Market Clarity has not assessed the routes taken between POPs by individual fibres. This document assesses only the location of POPs at which a fibre owner is now able to offer wholesale or retail customer connections to that fibre.**

**The table below indicates those locations for which three (3) or more carriers including Telstra have POPs present within the radius distance of the Post Office.**



**Table 1. – Fibre-Based Telecommunications Backhaul Infrastructure**

<b>Capital City</b>	<b>Regional Centre</b>	<b>State</b>	<b>Distance from Capital City to Regional Centre (Km)</b>	<b>Radius 5% of Distance (Km)</b>	<b>Post Office Name (Name of Regional Centre or Town)</b>	<b>Post Office Address</b>	<b>Number of Fibre Owners with POPs Within Radius Distance from Post Office</b>
Adelaide	Port Augusta	SA	306	15	Port Augusta	50 Commercial Road Port Augusta SA	3
Brisbane	Bundaberg	QLD	363	18	Bundaberg	157b Bourbong St Bundaberg QLD	4
Brisbane	Cairns	QLD	1681	84	Cairns	Shop 115-116 Cairns Central Shopping Cen Mcleod Street Cairns QLD	3
Brisbane	Gladstone	QLD	514	26	Gladstone	20 Chapple St Gladstone QLD	4
Brisbane	Mackay	QLD	951	48	Mackay	69-71 Sydney St Mackay QLD	4
Brisbane	Maryborough	QLD	264	13	Maryborough	227 Bazaar St Maryborough QLD	4
Brisbane	Rockhampton	QLD	615	31	Rockhampton	150 East St Rockhampton QLD	4
Brisbane	Townsville	QLD	1,335	67	Vincent	Shop 18 Vincent Village Shopping Centre 249 Fulham Road Vincent QLD	3
Melbourne	Wangaratta	VIC	250	13	Wangaratta	21 Murphy Street Wangaratta VIC	4
Melbourne	Warragul	VIC	105	5	Warragul	68 Smith Street Warragul VIC	3
Sydney	Armidale	NSW	499	25	Armidale	158 Beardy Street, Armidale, NSW	3
Sydney	Bega	NSW	425	21	Bega	150 Carp Street Bega NSW	3
Sydney	Campbelltown	NSW	58	3	Campbelltown	14 Dumaresq St Campbelltown NSW	4
Sydney	Coffs Harbour	NSW	535	27	Coffs Harbour	Park Beach Plaza Shopping Centre Shop 119 Coffs Harbour NSW	3

Capital City	Regional Centre	State	Distance from Capital City to Regional Centre (Km)	Radius 5% of Distance (Km)	Post Office Name (Name of Regional Centre or Town)	Post Office Address	Number of Fibre Owners with POPs Within Radius Distance from Post Office
Sydney	Gosford	NSW	76	4	Gosford	114 Erina St Gosford NSW	4
Sydney	Goulburn	NSW	196	10	Goulburn	165 Auburn Street Goulburn NSW	3
Sydney	Penrith	NSW	59	3	Penrith	Westfield Penrith Shop 70 585-591 High St Penrith NSW	5
Sydney	Tamworth	NSW	389	20	Tamworth	406 Peel Street Tamworth NSW	3
Sydney	Wagga Wagga	NSW	458	23	Wagga Wagga	Shop 46-47 Marketplace 87 Bayliss St Wagga Wagga NSW	5
Sydney	Wauchope	NSW	386	19	Port Macquarie	Shop 2 Palm Court Centre 14 - 16 Short Street Port Macquarie NSW	3

## Appendix 1 Instructions

This Appendix provides a copy of the instructions given to Market Clarity by Mallesons Stephen Jacques.

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**[C - I - C]**

## Appendix 1 - Declared Capital-Regional routes

Capital City	Regional Centre	Read Distance(km)
ADELAIDE	ALICE SPRINGS	1,530.0
ADELAIDE	BROKEN HILL	511.0
ADELAIDE	DARWIN	3,027.0
ADELAIDE	GAWLER	41.2
ADELAIDE	MOUNT GAMBIER	449.0
ADELAIDE	PORT AUGUSTA	306.0
BRISBANE	BUNDABERG	363.0
BRISBANE	CABOOLTURE	47.3
BRISBANE	CAIRNS	1,681.0
BRISBANE	CLONCURRY	1,707.0
BRISBANE	GLADSTONE	514.0
BRISBANE	MACKAY	951.0
BRISBANE	MARYBOROUGH	264.0
BRISBANE	NAMBOUR	104.0
BRISBANE	ROCKHAMPTON	615.0
BRISBANE	TOWNSVILLE	1,335.0
MELBOURNE	HOBART	703.0
MELBOURNE	KYNETON	85.1
MELBOURNE	LAUNCESTON	549.0
MELBOURNE	MILDURA	544.0
MELBOURNE	MORWELL	149.0
MELBOURNE	WANGARATTA	250.0
MELBOURNE	WARRAGUL	105.0
MELBOURNE	WARRNAMBOOL	269.0
PERTH	BUNBURY	181.0
PERTH	DERBY	2,382.0
PERTH	GERALDTON	424.0
PERTH	KALGOORLIE	594.0
PERTH	KATANNING	287.0
PERTH	PINJARRA	97.4
PERTH	PORT HEDLAND	1,637.0
SYDNEY	ARMIDALE	499.0
SYDNEY	BATHURST	203.0
SYDNEY	BEGA	425.0
SYDNEY	CAMPBELLTOWN	58.0
SYDNEY	COFFS HARBOUR	535.0
SYDNEY	GOSFORD	75.6
SYDNEY	GOULBURN	196.0
SYDNEY	GRIFFITH	574.0
SYDNEY	NOWRA	161.0
SYDNEY	ORANGE	257.0
SYDNEY	PENRITH	58.8
SYDNEY	TAMWORTH	389.0
SYDNEY	WAGGA	458.0
SYDNEY	WAUCHOPE	386.0
SYDNEY	WINDSOR	61.5