



# Digital Education Revolution ▶▶

Building tomorrow's workforce through access to world class education

## High Speed Broadband to Schools Initiative

### School broadband connectivity 2009

*As at 23 September 2009*

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## Introduction

Through the Digital Education Revolution (DER) \$100 million is available for the further development of affordable, fast broadband services for school education.

High speed broadband is the foundation on which information technology can be integrated into our schools, making a new approach to learning and teaching possible. Teachers, parents, students and other members of the community can get involved in online communication and information sharing, regardless of location or school system.

High speed broadband to schools is an important aspect of the DER, supporting:

- schools with the technological tools to work together (for example, virtual classrooms, video and audio streaming, high definition video conferencing) and create flexible, personalised learning for all students;
- teachers with the tools and support to be able to use, share and develop e-learning resources; and
- students with networked computers to interact with their peers and teachers in other schools across Australia and around the world.

On 7 April 2009, the Australian Government announced arrangements to build and operate the National Broadband Network (NBN). The Government has established a NBN Co Ltd to build and operate the network which will be open-access, wholesale and fibre to the premises (up to 100 megabits per second (mbps)) to 90 percent of all Australian homes, schools and workplaces. All other premises are to be connected with next generation wireless and satellite technology (12 mbps). It is expected that the company will invest up to \$43 billion over eight years to build the NBN.

The NBN will underpin the DER by providing affordable, high speed broadband to schools. The decision to position the NBN as a fibre to the premises network will mean that Australian school students will have access to similar bandwidth capabilities at home and at school, anywhere and at any time.

Every effort will be made to coordinate initiatives under the DER with the NBN rollout. The implementation of the initiative will be further developed following the review of regulatory arrangements and NBN implementation study.

The Government is working to increase connectivity and enhance the utility of broadband connections to school education through both initiatives.

## Purpose

This paper presents the aggregated national findings drawn from the 2009 schools connectivity survey<sup>1</sup>. This information will be used to support the rollout of the high speed broadband to schools component of the DER. This information will also be available for use in the implementation planning of the NBN.

The 2009 survey builds on the 2008 Fibre Connections to Schools baseline survey and includes information on the types of technologies, download speeds and carriage service providers used by schools.

The 2009 survey was distributed by the Department of Education, Employment and Workplace Relations (DEEWR) in June 2009 to government and non-government schools authorities. The survey reflects responses as at 23 September 2009.

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<sup>1</sup> This page contains only data at an aggregated national level in accordance with the confidentiality undertaking given by DEEWR to respondents.

## Summary of aggregated 2009 national survey findings

This summary presents the following findings:

- Use of broadband in schools;
- Use of bandwidth by schools;
- Carriage Service Providers servicing schools.

The findings are compared with 2008 survey data.

### Response rate

The overall response to the 2009 schools connectivity survey was 9831 schools (at 23 September 2009). This represents a response rate of 95.8 per cent of schools, compared to 92.4 per cent of schools which responded in 2008<sup>2</sup>. This equates to an overall increase in responses from 404 schools, the majority of which are independent schools. The number of schools surveyed in 2009 was 10265 compared to 10217 in 2008. Of the schools that responded, the response rates are as follows:

- 99.7 per cent for government schools (99.9 per cent in 2008);
- 97.2 per cent for Catholic schools (98.9 per cent in 2008);
- 71.5 per cent for independent schools (44.6 per cent in 2008).

The increase in the response rate by schools to the 2009 survey and the greater clarity in 2009 survey responses has impacted on the relative percentages in some categories of reporting (eg. types of technology and carriage service providers) compared to the 2008 survey.

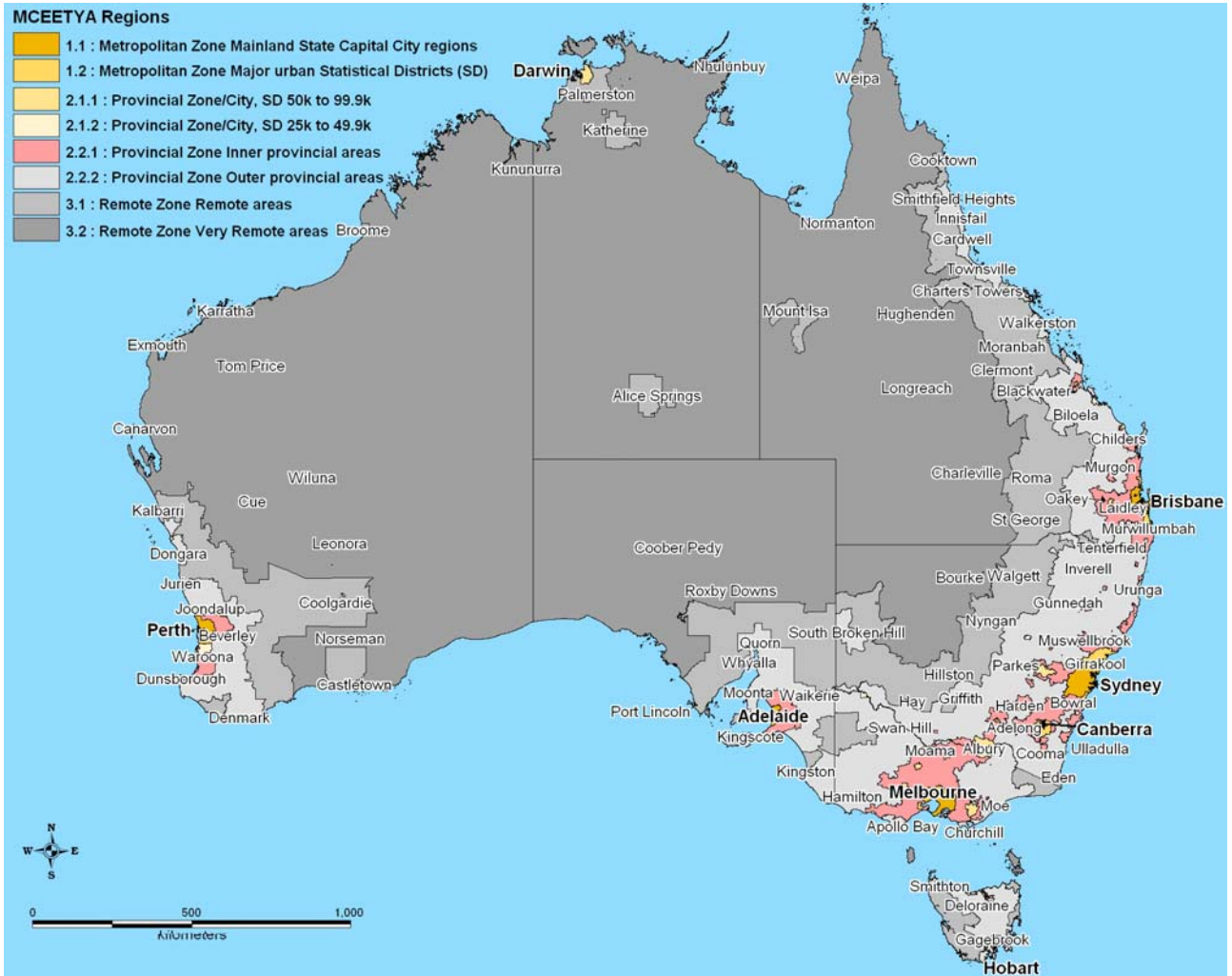
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<sup>2</sup> The list of schools surveyed in 2009 was derived from the DEEWR 2009 school census.

# 1. School Geographical Locations

The survey data is correlated with the MCEETYA School Geographical Regions (see Diagram 1).

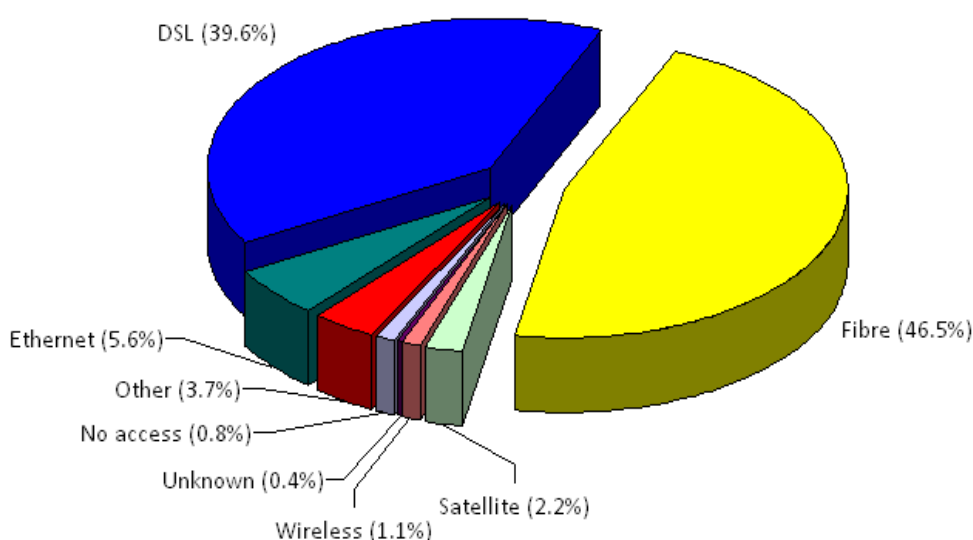
**Diagram 1: MCEETYA School Geographical Regions**



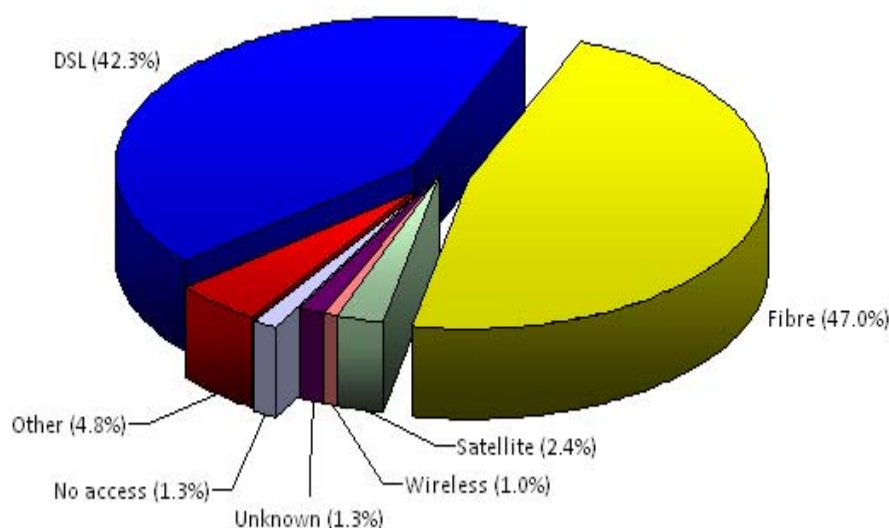
## 2. Technology types used by schools

A significant proportion of schools reported using fibre (46.5 per cent compared to 47.0 per cent in 2008). The decrease in the percentage of schools connected by fibre is due to the increase in the number of schools that responded to the 2009 survey and that these schools reported broadband services other than fibre. The actual number of schools that are connected by fibre increased from 4437 to 4574. 39.6 per cent reported using DSL (42.3 per cent in 2008), 2.2 per cent use satellite (2.4 per cent in 2008), and 0.8 per cent reported no broadband access (a decrease from 1.3 per cent in 2008). In 2009, Ethernet was reported as the technology for 5.6 per cent of schools (but was not reported in 2008). The remaining 3.7 per cent (4.8 per cent in 2008) of schools reported using a number of other non-fibre technologies<sup>3</sup> and 0.4 per cent (compared to 1.3 per cent in 2008) did not report a technology type (see Diagram 2). A glossary is provided on page 10.

**Diagram 2: Technology types used by schools (2009 survey)**



**Diagram 3: Technology types used by schools (2008 baseline survey)**



<sup>3</sup> Other non-fibre technology includes: frame relay (2.4 per cent), ISDN (1 per cent), microwave (0.24 per cent), dial-up (0.06 per cent), radio (0.01 per cent) technology).

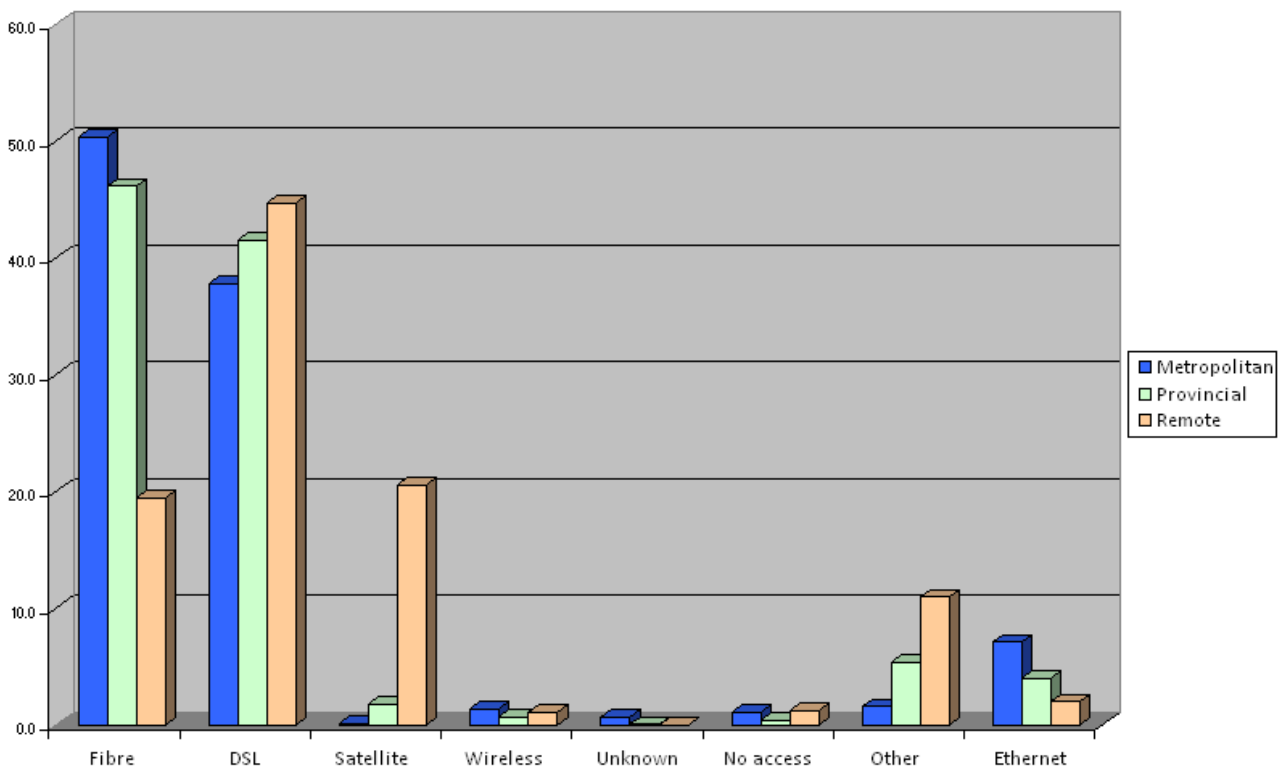
### 3. Technology types used by schools in MCEETYA School Geographical Regions<sup>4</sup>

Similar to the 2008 survey, the 2009 responses show that the majority of schools in metropolitan and provincial regions are connected by fibre. The responses indicate that 50.3 per cent of schools in metropolitan regions (51.6 per cent in 2008) and 46.1 per cent of schools in provincial regions (46.5 per cent in 2008) are connected by fibre.

Although DSL remains the second most used technology by schools in metropolitan and provincial regions, the percentage of schools connected by DSL has decreased compared to the 2008 survey. The 2009 survey indicates that 37.8 per cent of schools in metropolitan regions (42.5 per cent in 2008) and 41.5 per cent (42.2 per cent in 2008) of schools in provincial regions are connected by DSL.

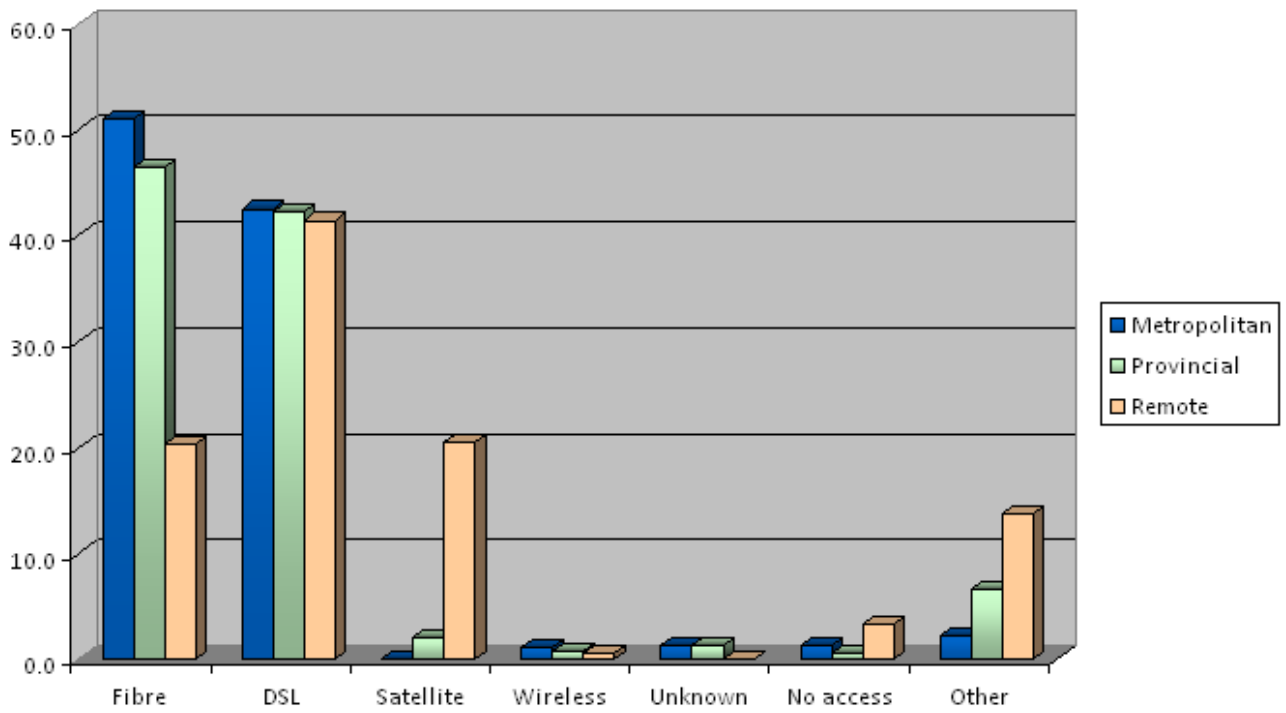
Of those schools in remote regions, 44.6 per cent reported using DSL (41.4 per cent in 2008), 20.1 per cent use satellite technology (20.4 per cent in 2008) and 19.4 per cent use fibre (20.4 per cent in 2008).

**Diagram 4: Technology types used by schools in the MCEETYA School Geographical Regions (2009 survey)**



<sup>4</sup> The regions listed are a result of the aggregation of the MCEETYA Schools Geographical Locations codes. 1.1 and 1.2 have been listed as Metropolitan, 2.1.1, 2.1.2, 2.2.1 and 2.2.2 as Provincial and 3.1 and 3.2 as Remote.

**Diagram 5: Technology types used by schools in the MCEETYA School Geographical Regions (2008 baseline survey)**

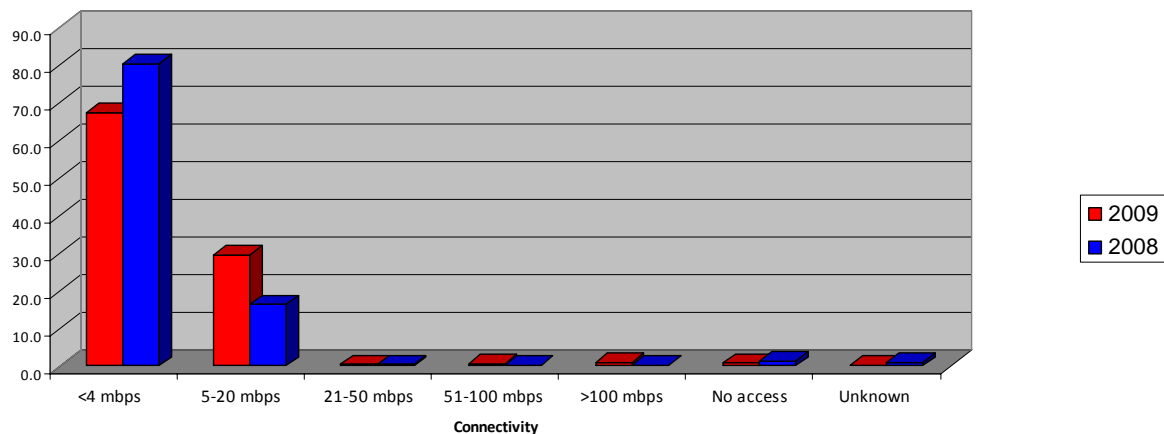


#### 4. Bandwidth used by schools

Although the use of fibre connections by schools in 2009 (46.5 per cent) is similar to the 2008 survey results (47.0 per cent), the download speeds used by schools has improved. 67.5 per cent use download speeds of 4 megabits per second or less compared to 80.5 per cent in the 2008 survey. The improvement in schools' download speeds are in the 5-20 mbps range. In 2009, 29.7 per cent of schools reported this speed compared to 16.4 per cent in 2008. These improvements relate to schools across all sectors. See Diagram 6 below.

The 2009 survey results indicate there remains a variation in the bandwidth used by schools in metropolitan and those in provincial and remote regions. The proportion of schools in the 4 megabits per second or less range is lower in metropolitan schools in 2009 at 60 per cent (75.7 per cent in 2008) and higher in provincial and remote areas at 75.6 per cent (87.1 per cent in 2008) and 81.8 per cent (84.4 per cent in 2008) respectively. The low download speeds used by schools in provincial and remote regions appear to be due to affordability of the service or the specific contractual arrangements negotiated.

**Diagram 6: Bandwidth used by schools (2009 survey)**



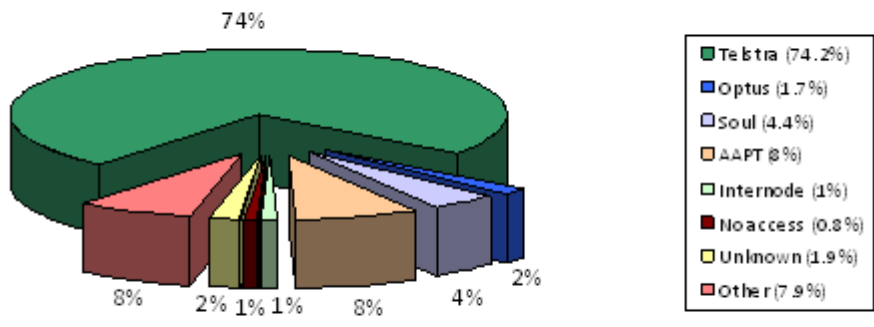
#### 5. Carriage service provider used by schools

The majority of schools reported the following five providers in the 2009 survey:

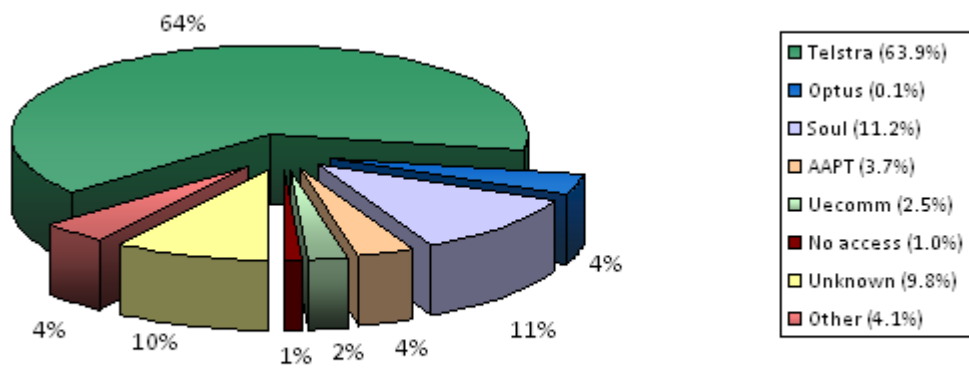
- Telstra (74.2 per cent compared to 63.9 per cent in 2008);
- AAPT (8 per cent compared to 3.7 per cent in 2008);
- Soul (4.4 per cent compared to 11.2 per cent in 2008);
- Optus (1.7 per cent compared to 3.9 per cent in 2008);
- Internode (1.0 per cent compared to 0.5 per cent in 2008).

See Diagram 7.

**Diagram 7: Carriage Service Providers used by schools (2009 survey)**



**Diagram 8: Carriage Service Providers used by schools (2008 baseline survey)**



## GLOSSARY

|                              |  |
|------------------------------|--|
| <b>Bandwidth</b>             | The capacity of a system to transfer data over a connection. Bandwidth is measured in bits per second (bps) and refers to the maximum bit rate. Bandwidth can be slowed by a number of users accessing the same connection.  |
| <b>Connectivity</b>          | The term used in the baseline questionnaire to refer to the current speeds the school was using. This does not necessarily reflect the maximum capability of the connection.   |
| <b>Dial-up</b>               | Internet access over the existing phone network. Requires a modem to dial into a node to establish a modem-to-modem link. Dial-up access has been superseded by broadband internet.  |
| <b>DSL</b>                   | This stands for digital subscriber line technology and may also be referred to as xDSL. This uses the existing phone network, which is made out of copper. Broadband performance is limited by the length, gauge and condition of the copper. The most common DSL technology is ADSL (asymmetric DSL).   |
| <b>Ethernet</b>              | A local area network that typically uses cable or twisted copper wires. It may also be wireless.   |
| <b>Fibre</b>                 | Refers to optical fibre, the highest-capacity known communications medium. Information is transmitted through a glass cable in the form of light pulses. Fibre cables are able to simultaneously carry multiple different light colours, making them faster and capable of transmitting larger material. They can be driven at whatever performance level and in whatever manner is required by the user. Fibre is capable of reaching longer distances and higher data rates. |
| <b>Fibre-to-the-premises</b> | Signifies where the fibre cables stop – fibre-to-the-premises (FTTP) means that even the last mile is fibre. Other options are: Fibre-to-the-node (FTTN) or Fibre-to-the-kerb (FTTK) or fibre-to-the-home (FTTH). A node may serve around 200 – 500 residential users. To the kerb locates the nodes 300m or less from the users. The closer the connection is to the consumer and the fewer people accessing the connection, the faster the connection.                       |
| <b>Frame Relay</b>           | A technology that transfers data like a baton in a relay race, through a series of intermediate nodes.   |
| <b>ISDN</b>                  | Stands for Integrated Services Digital Network. This technology uses the existing phone network.   |
| <b>Mbps</b>                  | Stands for Megabits per second. To download a mid-sized file quickly requires a connection of around 1 Mbps. Technology such as videoconferencing requires speeds upwards of 4 mbps.   |
| <b>Microwave</b>             | A method establishing a broadband connection using microwave dishes and a designated radio frequency.  |
| <b>Radio</b>                 | The transmission of communications by electromagnetic waves along a designated frequency.  |
| <b>Satellite</b>             | Internet access provided by Earth-orbiting satellites. They provide coverage to 100 per cent of Australia's land area and are available worldwide.   |

|                         |   |
|-------------------------|---|
| <b>Service Provider</b> | The retail provider of telecommunications services, such as broadband.  |
| <b>Speeds</b>           | Network speeds are measured in bits-per-second (bps), with the most common measures being a kilo-bit-per-second (abbreviated to kbps or 1024 bps), a megabit per second (Mbps or 1024 kbps), a gigabit per second (Gbps or 1024 Mbps) and a terabit per second (Tbps or 1024 Gbps). |
| <b>Wireless</b>         | A form of broadband connectivity that uses a wireless “last mile” to the customer’s premises. Radio is used to connect the user to a base station or transmission tower and then to a core network, such as the 3G mobile network.  |