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Senator Chris Ketter
Chair
Senate Economics References Committee
Parliament House
Canberra ACT 2600

Dear Senator

Inquiry into 2016 Census

I am pleased to provide a first submission from the Australian Bureau of Statistics (ABS) to assist the Committee with its Inquiry.

The ABS exists to inform decision-making, research and discussion by governments, business and the community by leading the collection, analysis and provision of high quality, objective and relevant statistical information. This has been the mission of my predecessors, and it is one that I, and my staff, strive to give it the greatest effect.

The Census is the most significant collection that the ABS conducts and it provides information that is critical for many important decisions by governments, businesses and the community. The ABS is committed to delivering a high quality 2016 Census and current indications are that this will be achieved.

The unavailability of the Census online system for nearly 2 days slowed our progress in collecting Census returns. However, by Sunday 14 August, after the online Census had been back up for 3 days and with paper forms arriving steadily, we had caught up to our expected Census collection path and then exceeded it over most of the coming weeks.

The timing of this Inquiry and the deadline set for submissions of 21 September means we have been preparing this submission while we are still undertaking the Census process. As a consequence, the information in the submission around Census completion is the latest available when the submission was lodged, and we will be able to provide the Committee with updated information in October.

With the wide-ranging Terms of Reference for this Inquiry, the ABS has sought to provide the Committee with an extensive submission that canvasses the dimensions of:

- the purpose and role of the ABS;
- the transformation of the ABS more generally over recent years;
- an overview of the extensive ABS work program;
- the importance of privacy to the ABS and the protections we have in place;
- the history of Censuses in Australia, including a history of debates around privacy and the Census;
- international developments in Censuses and their relevance to Australia;
- plans and preparations for the 2016 Census;
- two operational incidents affecting the Census: excess demand experienced by the telephone inquiry service and the Distributed Denial of Service (DDoS) attack on the night of 9 August;
- the latest information on Census responses, including work by the ABS to ensure a quality Census; and
- the Census, data integration and the use of names and addresses.

I look forward to an opportunity to discuss the ABS submission with the Committee at a later stage. The ABS may also provide a further submission to the Committee to provide more up-to-date information on the Census enumeration progress.

Yours faithfully

David W. Kalisch

21 September 2016



AUSTRALIAN BUREAU OF STATISTICS

Submission to the Senate Economics References
Committee's Inquiry into the 2016 Census of Population
and Housing

21 September 2016



OVERVIEW

The Australian Bureau of Statistics (ABS) is Australia's official statistical agency. For over 100 years, the ABS has informed decision-making, research and discussion by governments, business and the community by leading the collection, analysis and provision of high quality, objective and relevant statistical information¹. Each year the ABS releases around 500 statistical products, including the national accounts, Consumer Price Index, labour force and estimates of Australia's population, as well as a wide range of statistics covering other aspects of the economy, society and environment. The statistics that the ABS produces are relied upon heavily by decision makers in governments, businesses, community organisations and the broader community. There are over 15 million visits to the ABS website each year.

The ABS operates under two principal pieces of legislation – the *Census and Statistics Act 1905* and the *Australian Bureau of Statistics Act 1975*. They set out the primary functions, duties and powers of the ABS. Among other things, they establish the ABS as a Statutory Authority and impose strong obligations on maintaining the secrecy of information collected.

The ABS is committed to operating independently and objectively in a way that maintains its reputation as a world class statistical agency and retains the trust of the public. An independent survey² in 2015 found that in the general community 81% of people trust the ABS, which is a very high rating of trust for an organisation. The ABS intent is to be more open in engagement with its stakeholders, to strengthen partnerships and to be responsive to the statistical needs of Australian governments and the community, within the constraints of available resources.

To produce its statistics, the ABS relies on the cooperation of business and household providers, and partners in Australia's statistical system who legally share their data with the ABS. To help achieve this cooperation, the ABS has an organisational culture and track record of protecting the secrecy of information provided to it. While the ABS can compel respondents to provide information, this is used as a last resort to ensure reliable and unbiased statistics. The ABS thanks Australians for their willingness to cooperate. It does not take this for granted.

The ABS workforce is motivated, experienced, professional and highly qualified.

The Census and Statistics Act 1905 requires the ABS to take a Census every five years and the ABS is accountable for delivering quality Census data. The Census is by far the ABS's most significant undertaking. It produces a vast range of statistics that underpin critical decisions by governments, business and the community, including electoral and federal funding distributions. The Census has been called Australia's largest peace time logistical exercise. Over five years go into planning for the Census, with many important decisions taken years before the Census because of long lead-times. For example, for the 2016 Census, the decision to move to a 'digital-first' approach was taken during 2011-12; the funding for the Census was agreed by Government in 2013; testing was undertaken in

¹ Australian Bureau of Statistics Portfolio Budget Statements, 2016-17, available: http://www.treasury.gov.au/~media/Treasury/Publications%20and%20Media/Publications/2016/Portfolio%20Budget%20Statements%202016-17/Downloads/PDF/02_ABS.ashx

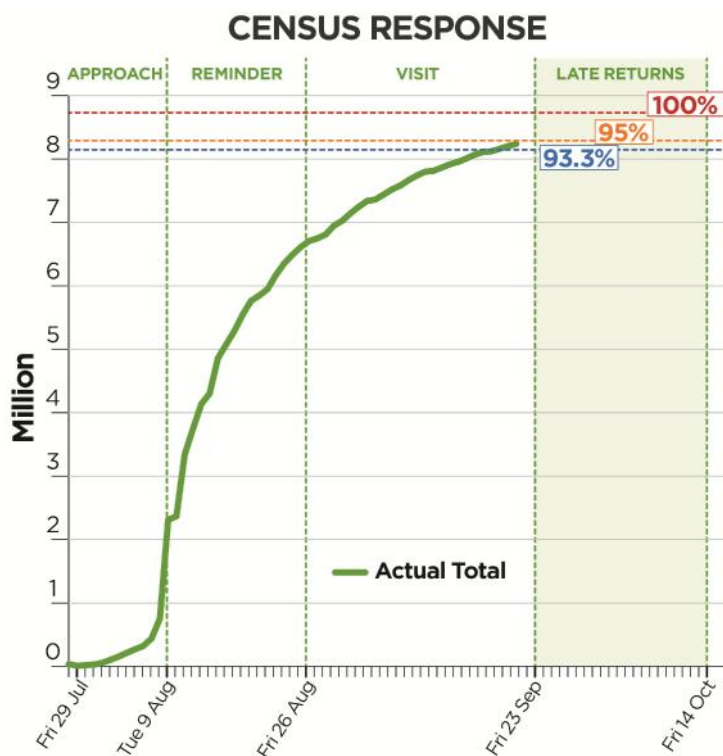
² Australian Bureau of Statistics, 2015 'Trust in ABS and ABS Statistics – A survey of informed users and the general community', cat. No. 1010.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1014.0>

2012, 2013, 2014 and 2015; and major procurement, including for the online Census system, commenced in 2014.

While each Census has a particular reference date – 9 August in the case of the 2016 Census – Censuses are collected over a period of months, and the 2016 collection period is planned to conclude at the end of September³. Although the ABS approached about 10 million dwellings, Census responses are only expected from occupied dwellings, and in 2011 more than 10% of dwellings were unoccupied on Census night.

This submission had to be prepared before the finish of the collection phase as it was required by 21 September. However, the ABS is confident that the 2016 Census will deliver high quality results. As at 20 September 2016, 94.4% of households had completed their Census return.⁴ Of these, 59% were completed online and 72% were obtained without any visit to the household’s home in the reminder phase. The chart below shows the progress in the receipt of Census forms. The ABS continues to receive thousands of additional forms each day, both through the online system and on paper through the mail system. It is expected that the final participation rate will be above 95%. As well as ensuring a high response rate overall, ABS follow-up activities are focussing on ensuring that quality response rates are achieved for small areas across Australia.

Figure – Responses to the 2016 Census, as at 20 September 2016



The number of persons refusing to complete the Census form is low. At 20 September 2016, there had been 6,743 refusals. This compares with 13,194 refusals received in 2011. Early investigations

³ Like in 2011, 2016 responses on paper forms are expected to be still received into October.

⁴ This preliminary participation rate is calculated by dividing the number of completed household forms received into the estimated number of dwellings. See Appendix 7 for a discussion of Census response rates.

have shown low rates of non-response to the 'name' question, and the estimated rates of non-response to selected other questions for 2016 is generally less than the rates of non-response in 2011. As these are early investigations, it is not possible to be certain but the ABS is reasonably confident that the non-response rates to the 2016 Census questions should be at least no worse than the relatively low level in 2011.

Inevitably in Censuses some people are not counted and some people are counted more than once. In Australia, a Post Enumeration Survey (PES) is conducted after each Census. The PES is a large household survey designed to provide an independent measure of the completeness of Census counts and it is used to compile estimates of the population estimates from Census results. The PES for the 2016 Census, which will cover 50,000 dwellings, will have an acceptable margin of error if the Census response rate is at least 93.3%. This Census response rate has already been achieved.

As for previous Censuses, quality assurance processes are a key feature of 2016 Census processing to ensure that processing errors are kept to an acceptable level and that the quality of outputs is high. The final data will be put through a series of checks to confirm their validity. The ABS always releases information on Census quality, but for the 2016 Census the ABS is also proposing to assemble an independent panel to provide extra assurance and transparency of Census quality. The first release of 2016 Census data will be on 11 April 2017, 2.5 months earlier than for any previous Census, and the PES results will be released by mid-2017.

The 2016 Census is a transformative one. Building on the success of the online Census in previous Censuses (most notably 2011, with a take up rate of 33%), the 2016 Census adopted a 'digital first' approach, while still ensuring that paper forms would be available for those who prefer that method. Reflecting the transformative nature of the Census, strong governance, planning and testing arrangements were put in place.

Key design features of the 2016 Census included changing the way Census materials were delivered and returned, removing the need for Census Field Officers to visit every dwelling, allowing approaches to be tailored to the needs of different areas and providing the ability to monitor progress on a 'real-time' basis and take effective action. The new approach planned to deliver savings of \$100 million in the running of the 2016 Census compared to the 2011 Census, and provide a sustainable model for future Censuses.

Changes to the 'traditional' Census model were needed to deal with challenges in recruiting large numbers of Census field-workers, ever-increasing costs in conducting the Census, and uneven data quality across the nation. Furthermore, the ABS leveraged work undertaken in other countries, such as Canada and New Zealand, in developing a new approach to the Census. The 2016 Census was also peer reviewed in April 2014 by a panel of international Census experts.

Three significant issues arose during the 2016 Census:

- Unprecedented demand experienced by the telephone and email Census Inquiry Service (CIS), which led to significant 'call-blocking', causing inconvenience to many members of the public.

- On the night of 9 August 2016 (Census night) the online Census, hosted by IBM, was subject to a Distributed Denial of Service (DDoS) attack that was not unusual and was anticipated, which affected the Census application system. This was not due to load from legitimate Census submissions, which at the time of the attack were running in line with ABS projections and well within the design load for the system. Around the same time, an unusual spike in outbound traffic was observed in the monitoring systems. These two events led to the closure of the online Census submission to the Australian public until the afternoon of 11 August 2016. While this caused inconvenience, protecting the information of Australians was the ABS's highest priority and Census information was never compromised.
- Public commentary prior to the Census around the ABS's decision to retain names from the Census for up to four years for the ABS statistical data integration program.

As with previous Censuses, the ABS established a telephone-based Census Inquiry Service (CIS). Due to a range of factors including public concerns regarding fines that had been unprompted by the ABS, faster than expected postage of approach letters and a general high awareness of the Census, the CIS experienced unprecedented demand that greatly exceeded ABS forecasts. The unavailability of the online Census on Census night significantly exacerbated the number of calls. This led to significant 'call blocking' and inconvenience for Australians both in the lead-up to and on Census night. We apologise for this, and the ABS will take account of this experience in planning future Censuses.

The online Census system was hosted by IBM under contract to the ABS and the DDoS attack should not have been able to disrupt the system. Despite extensive planning and preparation by the ABS for the 2016 Census this risk was not adequately addressed by IBM and the ABS will be more comprehensive in its management of risk in the future. However, once the system had been affected, the ABS took the precaution of closing the online Census form to safeguard and to protect data already submitted, protect the system from further incidents, and minimise disruption on the Australian public by ensuring reliable service.

The Government and Australian Signals Directorate (ASD) were notified by the ABS. Reviews by IBM, ASD and ABS finalised in the early morning of 10 August 2016 confirmed that the incident was a DDoS attack, and there was no intrusion or exfiltration and no Census data was compromised. This was affirmed by the Australian Privacy Commissioner in a statement on 11 August 2016 where he stated that the ABS's actions were 'pro-privacy'⁵.

The ABS apologised to the Australian public for the inconvenience caused, and the online Census system has now been available continuously for about six weeks. Since 11 August, 2.6 million households have completed their Census form using the online Census system.

The ABS is changing. There are new opportunities, and also challenges for Australia's national statistical office. To respond the ABS has embarked on a significant transformation of the organisation and its statistical business. This will provide the ABS with the capability and infrastructure to continue to better meet the statistical requirements of Australia within constrained

⁵ <https://www.oaic.gov.au/media-and-speeches/statements/census-2016-website-incident-august-9>

resources. Following on various reviews of the ABS in 2013 and 2014, including a review chaired by Tony Cole AO and supported by the APSC, in 2015, the Government made an investment of \$257m to modernise ABS infrastructure and business processes. This investment is part of a broader transformation program (due for completion in 2020) across six dimensions of environment (context), strategy, governance, people, culture and infrastructure.

The ABS seeks to meet the increasing information demands of governments, businesses and the community by making better use of information that is collected by it and other organisations. In recognition of these opportunities, the ABS began investing in a dedicated statistical data integration facility in 2005, including making better use of Census data. In 2009 there was additional investment as a result of funding to improve the estimation of Aboriginal and Torres Strait Islanders life expectancy using Census data integrated with mortality data. These investments have enabled ABS to provide insights into important public policy issues that would not otherwise be available. For example, the ABS has been able to provide information on the impact of car manufacturer closures in Victoria and South Australia, how different categories of migrants fared over time, how mental health programs and support services are used, and education outcomes of various types of students across various stages of the life-cycle.

Privacy and secrecy protections are the foundation of this work and the data integration investments have significantly enhanced the internal mechanisms in the ABS to keep personal data more secure. The ABS is an accredited data integration authority and all data integration activities are conducted within the secure environment.

Australia has had a long history of Census and privacy debates. Perhaps the most heightened Census privacy debates occurred in the 1970s. In 1976 the then Treasurer asked the Law Reform Commission to make recommendations that considered Census privacy. Following this major investigation, in 1979 the Law Reform Commission endorsed the importance of the Census and agreed that the processes used were appropriate, including the requirement to supply names. The Commission also examined the suggestion that the Census might be conducted on an anonymous basis. It concluded that *“an anonymous Census, like a voluntary one, would result in an unacceptable level of non-response and an equally unacceptable bias in responses. It would inhibit or prevent the conduct of the post-enumeration survey whose function is to assess the accuracy and completeness of census responses.”*⁶

In December 2015, the ABS announced a change in the length of time Census names (and addresses) would be retained, building on the increased capability of the ABS to integrate Census data with other sources safely and effectively, as demonstrated by the 2006 and 2011 Census Data Enhancement programs. The time frame for which names and addresses would be retained was extended from the end of the Census processing period until there was no longer any community benefit to their retention. The ABS made this decision following a public consultation process and on the basis that independently run focus group research indicated that support for the change and significant public concern would be unlikely.

⁶ The Law Reform Commission, Report No. 12, 'Privacy and the Census,' Canberra, 1979, available: <https://www.alrc.gov.au/sites/default/files/pdfs/publications/alrc12.pdf>

Notwithstanding this, in 2016 there was significant media commentary about the ABS's decision, which the ABS responded to. In April 2016 the ABS committed to the destruction of names from the 2016 Census no later than August 2020. Commentary, often uninformed, about the decision and about statistical data linking still continued. However sentiment testing, both before and after 9 August, showed that only a very small minority of Australians considered privacy concerns to be a barrier to them completing the Census. The small level of general community concern about privacy in relation to the 2016 Census was similar to that observed in the 2011 Census, as also shown by the high levels of participation in the 2016 Census.

With the change to retention of names and addresses, the ABS will be able to produce more policy relevant statistics on aspects such as industrial change in Australia, the performance of health and education services, and key determinants of changes in local communities and households over time. These new statistics will help governments and Parliaments make more informed policy choices over coming years.

Structure of the submission

This submission is organised as follows:

- Section 1 describes the role of the ABS, including our governance and how the ABS works with others while maintaining its independence.
- Section 2 is about the changing ABS, including its transformation program and work on maximising the value of data through statistical data integration.
- Section 3 provides information on the key components of the ABS forward work program.
- Section 4 discusses the importance of privacy to the ABS and describes how the ABS assures privacy.
- Section 5 is an introduction to Censuses of Population and Housing.
- Section 6 provides a history of Censuses in Australia, including a history of privacy debates around the Census.
- Section 7 discusses international trends in Censuses, including the use of administrative data and the use of technology.
- Section 8 is about the design and preparation of the 2016 Census. It provides information on governance and planning; the innovative design of the 2016 Census; and the development and implementation of the Census, including testing and communications.
- Section 9 is about two operational incidents affecting the 2016 Census. The first is excess demand experienced by the Census Telephone Enquiry Service in the lead up to, and during the Census. The second is the DDoS attack on 9 August and the subsequent events.
- Section 10 is on the 2016 Census outcomes to the extent they are known at the time this submission was required by the Committee. It describes the response to the Census and the work being undertaken by the ABS to ensure quality Census results.

- Section 11 is about the Census and data integration. It shows how value is added by integrating Census data with other data. It discusses the issue of the retention of names in the 2016 Census.

SECTION 1 – THE ROLE AND OPERATIONS OF THE ABS

1.1 Introduction

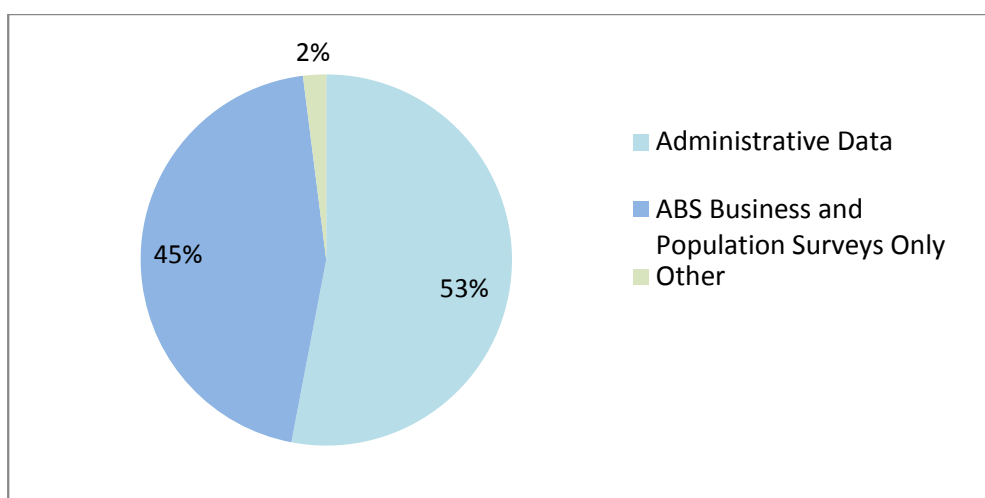
The ABS is Australia’s official national statistical agency, providing trusted official statistics on a wide range of economic, social, population and environmental matters of importance to Australia. These statistics contribute to the wellbeing of Australians and to Australian democracy. They represent an investment in Australia’s future, allowing governments to effectively plan economically, allocate tens of billions of dollars in payments across the nation, and to set and measure the efficiency and effectiveness of public policies and service delivery programs. These statistics also support research and inform decisions being made every day by businesses, non-government organisations and the wider Australian community.

The ABS releases around 500 statistical products each year, including the national accounts, the Consumer Price Index, labour force, estimates of Australia’s population, balance of payments, government finance, industry statistics, environmental accounts, health statistics, education statistics, crime statistics and cultural and welfare statistics. Its statistical program is underpinned by rigorous and professional methods that ensure high quality statistics. Each year, the ABS attracts over 15 million visitors to its website¹.

An independent survey² in 2015 found that institutional trust was high among general community respondents with 81% indicating that they either trust greatly or tend to trust the ABS. Among the informed users of ABS products, the level of trust rose to 100%. These are very high trust ratings for an organisation, and higher than comparable surveys of statistical organisations in other countries.

The ABS collects information from individuals, households, businesses and governments through surveys and by gathering administrative data (see Figure 1). The ABS sources over half of its data from public and private sector administrative data sources and around 45% from surveys of businesses and people.

Figure 1 - Data sources for all ABS publications in 2015



¹ www.abs.gov.au.

² Australian Bureau of Statistics, 2015 'Trust in ABS and ABS Statistics – A survey of informed users and the general community', cat. No. 1010.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1014.0>

The most significant statistical collection that the ABS undertakes is the five-yearly Census of Population and Housing. The Census is critical to form the basis for accurate population estimates, and Census results are used by governments, businesses, researchers and the community to underpin important policy and investment decisions.

1.2 Enabling legislation

The ABS is a Statutory Authority, originally established as the Commonwealth Bureau of Statistics with the passing of the *Census and Statistics Act 1905*. The agency became the 'Australian Bureau of Statistics' in 1975 with the passing of the *Australian Bureau of Statistics Act 1975*.

The *Australian Bureau of Statistics Act 1975* and the *Census and Statistics Act 1905* set out the primary functions, duties and powers of the ABS.

The *Australian Bureau of Statistics Act 1975* establishes the ABS as an independent Statutory Authority, with Section 6(1) describing the six functions of the ABS as being to:

- constitute the central statistical authority for the Australian Government and provide services for the state and territory governments
- collect, compile, analyse and disseminate statistics and related information
- ensure coordination of the operations of official bodies in the collection, compilation and dissemination of statistics and related information, with a particular focus on minimising duplication and maximising the use and re-use of existing data and data infrastructure
- develop standards for statistics and ensure compliance
- give advice and assistance to official bodies in relation to statistics
- provide liaison between Australia, other countries and international organisations on statistical issues.

The Census and Statistics Act 1905:

- empowers the Australian Statistician to collect statistical information on a broad range of demographic, economic, environmental and social topics
- enables the Australian Statistician to direct a person to provide statistical information, in which case they are legally obliged to do so
- requires the ABS to publish the results of these statistical collections
- places a life-long obligation on all ABS officers to maintain the secrecy of information collected under the Act, and provides harsh penalties for those who fail to do so.

Under the *Statistics (Arrangements with States) Act 1956*, Australian and state government statistical services have been integrated since 1958 (from 1924 for Tasmania). Although not covered by legislation, similar arrangements apply in both territories.

The ABS is also governed by the *Public Service Act 1999*, the principal Act governing the establishment and operation of, and employment in, the Australian Public Service; and is subject to requirements of the *Public Governance, Performance and Accountability (PGPA) Act 2013*, the *Freedom of Information Act 1982*, the *Privacy Act 1988* and the *Public Interest Disclosure Act 2013*.

1.3 Ministerial oversight and governance

The ABS operates as part of the Australian Government as a Statutory Authority and is accountable to the Parliament, and ultimately to the public, through the Treasury Ministers, the Parliamentary Committee process and the tabling of its annual report. The ABS is part of the Treasury Portfolio and is currently under the responsibility of the Minister for Small Business. Under the *Census and Statistics Act 1905* the Minister may direct the ABS to undertake the collection of statistical information, but it is the Australian Statistician's responsibility to determine the methods for collection and to publish results. In practice, such Ministerial direction has never occurred.

The *Australian Bureau of Statistics Act 1975* established the Australian Statistics Advisory Council (ASAC) to be the key advisory body to the Minister and the ABS on statistical services. It provides valuable input to the directions and priorities of the ABS work program and reports annually to Parliament. ASAC meets at least twice a year. ASAC members are appointed by the Minister, including the appointment of a single nominee from each State Premier or Territory Chief Minister.

All state and territory governments are represented on ASAC. Other Council members are chosen to represent a broad cross-section of perspectives, covering government, business, academic and community interests. The current Chair of ASAC is Geoff Allen AM, Director of ACIL Allen Consulting. Mr Allen was reappointed as Chair on 28 February 2012.

The *Australian Bureau of Statistics Act 1975* states that the Australian Statistician controls the operations of the ABS. The Australian Statistician is supported by a range of governance mechanisms. The peak internal governance forum in the ABS is the Executive Leadership Group which consists of the Australian Statistician, the three Deputy Australian Statisticians and the General Manager of the Strategy and Partnerships Division. Other significant committees are the Audit and Protective Security Management Committees.

The ABS has a range of standing groups in which it engages and consults with users and other stakeholders. The two peak groups are the Economic Statistics Advisory Group and the Population and Social Statistics Advisory Group.

An outline of the ABS governance model is provided at Appendix 1.

The ABS has a Corporate Plan³ which is updated annually in line with the requirements of the *PGPA Act 2013*.

1.4 Working across Government and supporting priorities

The first Statement of Expectations⁴ for the ABS, which was issued by the then Treasurer, the Hon Joe Hockey on 27 July 2015, outlines the Australian Government's expectations of the ABS when carrying out its roles and responsibilities. The Statement recognises the independence of the ABS as

³ The latest version can be found at <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1005.0?OpenDocument>.

⁴ Australian Bureau of Statistics, 'ABS Statement of Expectations and Intent', September 2015, available: <http://www.abs.gov.au/websitedbs/D3310114.nsf/Home/ABS+Statements+of+Expectations+and+Intent?opendocument>

a Statutory Authority, and also recognises the need for the ABS to take into account the Government's broad policy framework in performing its role and meeting its responsibilities.

The ABS response, or Statement of Intent⁵ (issued by the Australian Statistician on 17 September 2015), highlights the ABS's and the Australian Statistician's commitment to continue to operate independently and objectively in performing its day-to-day business in a way that maintains its reputation as a world-class statistical agency, retains the trust of the public, and supports and promotes the efficient and effective delivery of official statistics for Australia.

It specifically states that:

- The ABS will be cognisant of the Government's key policy objectives and participate, where possible, in initiatives that are directly relevant to the ABS. The ABS will also consider the outcomes or recommendations of relevant Government established panels, reviews or inquiries.
- The ABS will be transparent and accountable in relation to its role as the central statistical authority for Australian governments, including through the publication of its corporate plan, forward work program and annual report.
- The ABS intent is to be more open in its engagement with stakeholders, to strengthen partnerships and to be responsive to the statistical needs of Australian governments and the community, within the constraints of available resources.

1.5 Funding

The ABS is principally funded by the Australian Government. The ABS departmental appropriation for 2015-2016 was \$428.6 million. This includes Census appropriation, which is cyclical in nature. In the 2015-16 Budget, the Government announced a \$257 million investment in the ABS over five years to modernise ageing systems and processes and to develop the statistical capabilities required for a 21st century national statistical office.

In addition, the ABS is able to retain revenue from the sale of its goods and services. In 2014-15, the amount of this revenue was \$41.0 million, predominately from Commonwealth agencies towards the delivery of user-funded sample surveys, such as the National Health Survey, Survey of Disability, Ageing and Carers and the Personal Safety Survey. The funds received recover the costs of conducting the surveys.

The ABS does not, and is not permitted to, sell data about individual persons or businesses.

Section 2.1 provides more information on the ABS's resource situation.

⁵ Australian Bureau of Statistics, 'ABS Statement of Expectations and Intent', September 2015, available: <http://www.abs.gov.au/websitedbs/D3310114.nsf/Home/ABS+Statements+of+Expectations+and+Intent?open+document>

1.6 Structure and staff

The ABS has about 3,000 ongoing staff including 500 interviewers. The ABS has a national workforce of about 2,500 office-based staff in the Statistical Services Group, the Statistical Business Transformation Group, the Enabling Services Group and the Strategy and Partnerships Division, and 500 field-based Interviewers. The ABS has nine offices, one in each state and territory capital, with the ninth office established in Geelong in early 2016. The Geelong office provides a centre of excellence for the collection of statistical information.

The ABS workforce is professional and highly qualified, with 72% of office-based staff possessing a graduate qualification (with 27% holding a post graduate qualification). This compares with the broader APS where 53% of staff have graduate qualifications.

An outline of the ABS organisational structure is provided at Appendix 2.

SECTION 2 – THE CHANGING ABS

2.1 Resource context

The ABS annual appropriation is cyclical in nature, primarily due to the Census which peaks every five years with the collection and processing of Census data. The average, annual non-Census appropriation of the ABS is around \$259 million per year, however the 2016-17 total appropriation is \$520.3 million, including \$213.5 million of Census expenditure and \$38.1 million for the statistical business transformation program. The table below shows the total appropriation funding for the 2016 Census:

Table 2.1 - Appropriation funding for the 2016 Census

	Appropriation funding for the 2016 Census (\$m)
2012-13	43.8
2013-14	50.4
2014-15	68.4
2015-16	93.7
2016-17	213.5
Total	470.0

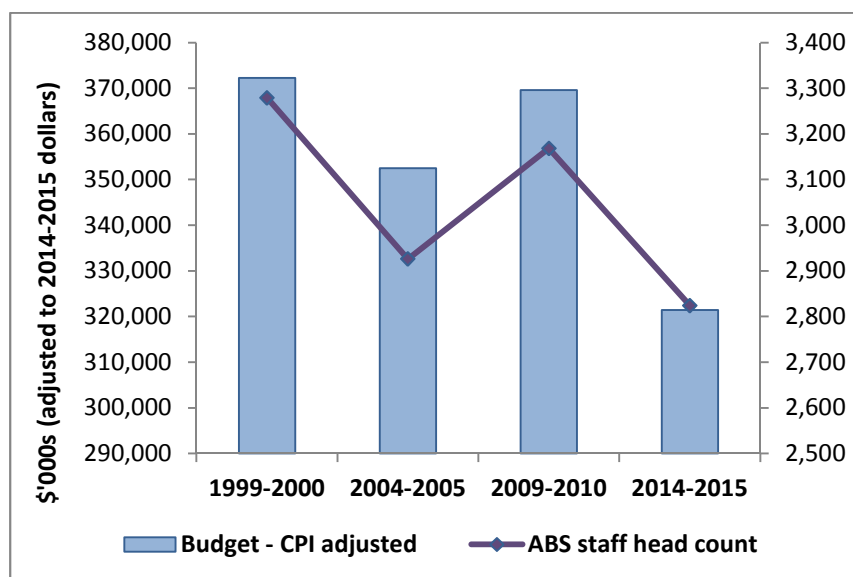
In the 2013-14 Budget, the Government agreed to shift \$69 million of Census funding from 2016-17 to earlier development years (2013-14, 2014-15 and 2015-16) in order to fund the infrastructure required for Census 2016 and the transformation of the Census approach (see Section 8.2 for an outline of the innovative design of the 2016 Census).

In the 2015-16 Budget, the Government agreed to additional funding of \$257 million to the ABS for critical infrastructure enhancements to support ABS transformation over the five-year period to 2019-20. This comprised \$190 million operating expense and a \$67 million capital injection.

This investment in the ABS statistical business transformation will largely be used to update and replace fragile and ageing infrastructure (other than the Census, which had previously been separately funded). This investment will enable the ABS to modernise its statistical business model to reduce the risk of error in statistical outputs; reduce red tape for providers; and achieve faster turnaround in dissemination of statistics in a more complex world. The additional investment does not allow for new statistical collections, and at the conclusion of the program, the ABS ongoing operating budget, excluding Census, will reduce by 10%, or by approximately \$27 million per annum. The reduction in appropriation reflects expected savings from more efficient operations after the completion of the transformation program.

Figure 2.1 shows the ABS appropriation and staff numbers over the past 15 years. Five year intervals are shown to compare the resource situation at the same stage of the Census cycle.

Figure 2.1 - ABS budget and staff numbers, 1999-2000 to 2014-15 (\$'000)¹



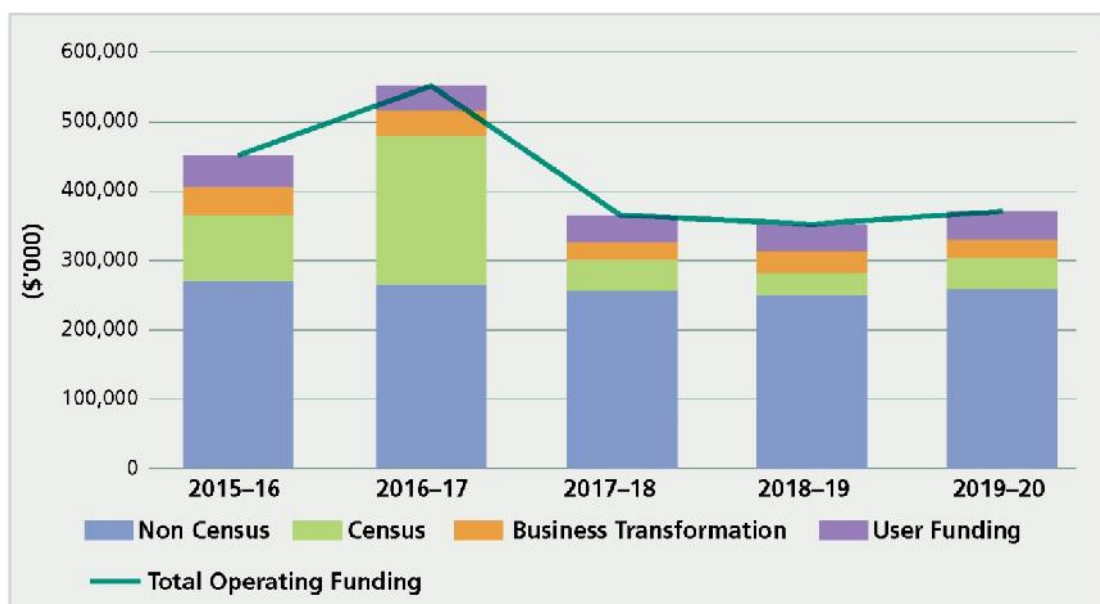
Note: Five year intervals are selected to enable comparisons over time that reflect the same period in the Census five yearly funding cycle.

Over the last 15 years, ABS resources have generally been reducing. Its staff numbers have fallen by 14% and the budget appropriation (in real terms) has also fallen by 14%. In contrast, the demands on the ABS to properly measure the economy, society and the environment, and respond to the requirements of governments, has increased and become more complex.

While the ABS has strived to operate efficiently and has a strong track record of innovation to improve its efficiency, the ABS has occasionally had to reduce its work program to remain within its budget and to continue to produce high quality statistics. Most recently this occurred in 2014, when the ABS discontinued six statistical programs and made reductions to a further seven.

In line with ABS forward funding (Figure 2.2), non-Census staffing affordability decreases significantly over the next four years with required reductions of approximately 400 staff in 2016-17, 300 in 2017-18, and then a further 40 in 2018-19.

¹ Note: Does not include field staff. Numbers are taken from the ABS Annual report.

Figure 2.2 - ABS operating funding, 2014-15 to 2019-20 (\$'000)

The ABS will respond to these challenges by:

- Striving to enhance the efficiency of its operations and enhance productivity, including through considering the outcomes of the Government commissioned Functional and Efficiency Review of the ABS, which will be conducted before the end of 2016;
- Adapting priorities and practices to take advantage of new information opportunities and respond to new measurement challenges; and
- Consulting, during 2016-17, with partners and stakeholders to consider how some resources could be freed up in order to facilitate new, high value, work to meet evolving priorities. In particular, partners and stakeholders will be consulted on the frequency of some statistical series and whether continued ABS involvement is warranted for some tier 3 statistics (see Section 2.2 below).

2.2 Determining the ABS work program

The ABS never has enough appropriation to produce all of the statistics or provide all of the statistical services that users want. In order to determine a work program that can produce high quality statistics within available resources, the ABS works with key users to prioritise its work. In recent times, this process has become more structured with the development of 'tiers' to guide work program priorities. Figure 2.3 explains the tiers.

As mentioned in Section 1, the ABS is able to retain revenue from sales of goods and services. Most of this revenue is generated from funding that the ABS receives from other Commonwealth Government agencies to meet unmet needs and to expand its statistical collection program through user-funded surveys. The level of user funding varies significantly across programs and from year to year. User funding work is predominantly in Tier 3, which is important statistical work to meet

identified user requirements that could not otherwise be undertaken through ABS appropriation. Results from user funded work are made available publicly.

Figure 2.3 - ABS work program by tier

TIER	COMPONENT	
CORE	Tier 0	Essential institutional statistical capability and infrastructure required to deliver a quality national statistical service and remain relevant and sustainable as Australia's national statistical organisation. This includes: systems and processes; methods; people capability; registers, frames and standards; classifications and conceptual frameworks; data integration; dissemination and technology capabilities.
	Tier 1	Statistics that are considered to be the foundation work of a national statistical organisation.
	Tier 2	Important areas of statistics where there is a significant government outlay or where there is a significant public policy interest.
OTHER	Tier 3	Other important statistical work that is currently undertaken to meet identified user requirements that could be deemed as falling beyond tiers 1 to 2.

The above four tiers are used to classify the ABS work program to assist with prioritisation of resources. This work was informed by the development of the list of *Essential Statistical Assets for Australia*² first compiled in respect of 2013 and which was undertaken in consultation with a wide range of stakeholders. Appendix 3 summarises the ABS work program against each of these tiers. The ABS will publish the ABS work program, prioritised for 2016-17, in October 2016 in a publication titled *Australian Bureau of Statistics, Forward Work Program, 2016-17*.

2.3 Organisational transformation

The statistical landscape is becoming more complex, expectations for statistical information are growing, and the ABS is being challenged to deliver the best possible statistical program in more efficient and innovative ways.

In 2013 the Australian Public Service Commission (APSC) undertook a capability review³ of the ABS, as part of a broader program of reviews of Government agencies. The review team, led by Tony Cole AO, found that the ABS is "*widely regarded as one of the best statistical agencies in the world. It has a strong reputation as a highly respected and trusted institution*". While the reviewers noted that the independence of the Statistician was a prerequisite to this respect and trust, they also noted that the manner in which this independence had been exercised had contributed to a degree of organisational isolation and insularity that needed to be addressed.

² Australian Bureau of Statistics, 2015, *Essential Statistical Assets for Australia*, cat. No. 1395.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1395.0>

³ Australian Public Service Commission, 'Capability Review: Australian Bureau of Statistics', December 2013, available: http://www.apsc.gov.au/_data/assets/pdf_file/0004/64543/ABS-Capability-Review.pdf

A key finding from the report was that the ABS had worked hard to strategically position the agency for the future. However, it also noted that the ABS was at a "cross-roads" and needed to more fully address the challenges of the changing environment (in particular big data and the greater availability of administrative data) as a more open, engaged partner.

The review noted that:

- ABS needs to be more connected with its stakeholders
- ABS and its partners need to be better prepared to maximise the potential of big data and the information age
- Greater availability of administrative data held by government agencies is key in developing whole-of-government solutions to the challenges facing Australia. There is an opportunity for the ABS to be a leader and coordinator in unlocking the statistical potential of administrative datasets across government
- ABS's core statistical business processes and IT are well overdue for an upgrade.

The review was published in late 2014. The ABS, through the previous Australian Statistician, Mr Brian Pink, accepted the findings of the review and the ABS response to the review was published in Section 5 of the ASPC's report.

During 2014, there were further reviews of the ABS, including the McCarthy Independent Technical Review into the Labour Force Survey. A key finding of these reviews was that the ABS needed to improve its management of 'statistical' risks, particularly during times of change.

In response to these reviews, and in response to engagement with our key stakeholders and building on previous initiatives to reposition the ABS, the ABS is undergoing a major transformation (due for completion in 2020) across six dimensions of environment, strategy, governance, people, culture and infrastructure. The objectives of each dimension are to:

- ensure ABS staff better understand the **environment (context)** in which the ABS operates, including the central relationship with the Australian Government
- develop and deliver corporate **strategy** that has a focus on the ABS being both rigorous and innovative, with greater attention to statistical priorities of main economic indicators and key population statistics, that encourages effective relationships with key partners and prudent use of taxpayer resources
- have **governance** arrangements that deliver sound, timely decision making and accountability (including improved statistical risk management (see Section 2.4 below))
- ensure it has a workforce (**people**) and **culture** that enables the ABS to deliver its expected outcomes
- modernise its statistical **infrastructure** so the ABS can: undertake its information activities more cost-effectively; reduce risks of errors in statistical outputs; reduce red tape for providers; and achieve faster turnaround in dissemination of statistics both now and into the future (see Section 2.5 below).

The transformation of the ABS will enable delivery of greater value both in terms of increased statistical information and value for money. While the full benefits of transformation will not be realised until the completion of the program, benefits are already being delivered.

A regular survey of staff is used to test and monitor transformation progress, and enable improvements to communication and cultural change plans. The ABS uses independent assessments to monitor the health of its collaborations and partnerships. State of service results and workforce planning approaches also allow the ABS to test progress.

Appendix 4 summarises the status of achievements against the transformation program for each of the key dimensions. This information will be published in the ABS's 2015-16 Annual Report.

2.4 Statistical risk management

In regard to statistical risk management (an element of the 'governance' dimension of transformation and overseen by the Statistical Strategy Committee)⁴, the ABS has adopted a more proactive and fit for purpose management of risk with a view to:

- more accurately foreseeing and managing the cumulative impacts of change on key economic and population statistics;
- enhancing the quality assurance for significant statistics;
- ensuring clear lines of accountability and clear governance; and
- ensuring risk management is streamlined, pragmatic and actually makes a difference, without unnecessarily stifling innovation.

A new risk management framework has been developed, inclusive of statistical risk, and applied as a priority to the National Accounts, the labour force survey, the Consumer Price Index and Estimated Resident Population (and the key inputs into these products). Comprehensive statistical risk review and management plans were in place for the 2016 Census, and have been critical in ensuring the statistical outcomes from the 2016 Census have remained on track. For more information on statistical risk management in the Census refer to Section 10.

2.5 Statistical Business Transformation Program

The \$257 million Government investment to modernise ABS infrastructure and business processes agreed in the 2015-16 Budget and funded over the next five years will reduce risks to statistical outputs; reduce costs; reduce red tape for providers; and achieve faster turnaround in dissemination of statistics. The formal program followed extensive preparatory work in the preceding years.

The investment will allow the ABS to transform its current business operating model and build the infrastructure required to support the changed model. Outside of the Census program, which

⁴ A high-level ABS committee that provides oversight of the ABS's statistical program.

received separate investment, the ABS is operating with a large portfolio of aged, siloed, inflexible and increasingly fragile IT systems and related business processes supporting individual collections. Standardised business processes, IT tools and infrastructure will enable more responsive and effective collection, processing, analysis and dissemination of data. As a result of introducing improved collection processes, the effort and cost for providers (both business and household) will fall.

The program will involve the reengineering (efficient redesign and consolidation) of 177 statistical business lines. This will be done in a way that minimises the impact on statistics through the application of statistical risk management as described above.

The ABS's Statistical Business Transformation Program has a strong focus on delivering capabilities required to effectively provide value-added statistical solutions – both regular and one-off products and services – able to meet current and emerging priorities.

Investment in infrastructure is the enabler for a wider Transforming Statistics program which will significantly enhance the ABS's ability to deliver statistical solutions that better meet the evolving needs of users of statistics. Enhancing the ABS's statistical capability involves major redesign of ABS statistical collections, methods, products and services in order to deliver a more sustainable statistical program that extracts greater value from available data, to produce modern statistical solutions.

The ABS Statistical Business Transformation Executive Program Board, made up of external and internal senior ABS staff members and chaired by the Australian Statistician, is responsible for guiding the Program towards successful delivery.

2.6 ABS developments in statistical data integration

With increasing information needs and a constrained fiscal environment, national statistical offices around the globe have been adopting data integration techniques to maximise the use of existing data. The opportunities offered by new technology and advances in analytical capability are enabling data integration to increase the depth and breadth of information available to support public policy, community awareness and research at less cost and less burden on households and businesses than traditional survey methods.

Since the early 2000s, the ABS has studied developments in other national statistical offices in relation to statistical data integration, and has also been encouraged by data linking work in Australian jurisdictions. This has shown the potential to deliver new statistical insights in a way that does not compromise privacy or add to the reporting burden on households and businesses.

In recognition of the opportunities, the ABS began investing in a dedicated statistical data integration facility in 2005. In 2009 there was additional investment as a result of funding to improve the estimation of Aboriginal and Torres Strait Islanders life expectancy using statistical data integration. The facility was subsequently independently accredited as a Commonwealth data integration facility in 2012 (Box 2.1). These investments have positioned the ABS to innovate to take

advantage of new information demands in a more timely and cost-effective manner. It has significantly enhanced the internal mechanisms the ABS uses to keep personal information more secure, over and above the ABS's historically strong protections.

The ABS only ever undertakes data linking for statistical purposes and does not release any information in a manner that would identify individuals or businesses, consistent with legislative requirements.

Box 2.1: Commonwealth arrangements for data integration involving Commonwealth data for Statistical and Research purposes

In 2010 Commonwealth Portfolio Secretaries established and endorsed a set of 'high level principles' to govern integration of Commonwealth data for statistical and research purposes, as well as a set of governance and institutional arrangements to support these principles.

In 2012, the ABS was accredited under the Commonwealth arrangements to undertake data integration safely and in a manner that safeguards the privacy of all Australians.

More information and a copy of the ABS accreditation claims, which have been verified by an independent auditor, are available through the National Statistical Service website.⁵

These developments are highly consistent with the Australian Government Public Data Policy Statement⁶ which states that:

"The data held by the Australian Government is a strategic national resource that holds considerable value for growing the economy, improving service delivery and transforming policy outcomes for the Nation."

The ABS is a significant participant in the Australian Government's Public Sector Data Initiative, and has actively partnered with Australian Government policy agencies in six of the seven high value demonstration projects⁷ focussed on key policy questions such as early interventions for troubled families, better targeting of mental health services, and productivity in Australian firms, for example.

In parallel to building data integration capability, the ABS has pursued developments in data confidentiality methods that ensure the confidentiality of an individual's data while informing important public policy decisions. The ABS's capability and expertise in these areas were also recognised in the Australian Government's Public Sector Data Initiative recommendation to establish a trusted access model for effective and safe use of integrated data. For further information on statistical data integration and the ABS's work in this area see Section 11 and Appendix 5.

⁵ <http://www.nss.gov.au/>

⁶ https://www.dpmc.gov.au/sites/default/files/publications/aust_govt_public_data_policy_statement_1.pdf

⁷ Public Sector Data Management, Implementation Report, 2016
<https://www.dpmc.gov.au/sites/default/files/publications/Implementation%20of%20the%20Public%20Sector%20Data%20Management%20Report.pdf>

In September 2015, a Parliamentary Delegation of Members of the Joint Committee on Public Accounts and Audit (JCPAA) visited New Zealand for the purpose of gaining a better understanding of New Zealand's approach to public sector reform. The visit highlighted the analysis and insights available from cross-agency data through the New Zealand Integrated Data Infrastructure (IDI).

In its report⁸ the Committee outlined the expectation on the public sector in New Zealand to make better use of data and create greater value from data that the government holds. The report notes three particular areas where the benefits of the IDI are demonstrated:

- i. Using integrated data to improve social and economic outcomes:
'integrated data gives a view across government so agencies can deliver better services to the public and ensure investment is made where it's most needed.' (paragraph 2.15).
- ii. Using integrated data to analyse costs and benefits of spending programs to target early interventions:
'Members of the FEC (Finance and Economics Committee) referred to integrated data profiling as enabling governments to achieve good returns on early interventions.' (paragraph 2.16).
- iii. Using integrated data to improve interaction with government:
'...it is still early days but there are hopeful signs, like agencies working together to develop efficient 'wrap around' services, which will make it simpler for citizens to interact with government at key points in their lives like childbirth or retirement.' (paragraph 2.17).

The Committee recommended that 'the Australian Bureau of Statistics examine the use of data in New Zealand and report back to the JCPAA on whether this approach could be adopted in Australia'.

A formal response from the Australian Statistician to the Chair of the JCPAA (through the relevant Minister) on this administrative recommendation is due in mid-November 2016. Further information about the New Zealand Integrated Data Infrastructure and its policy use is provided in Appendix 6.

⁸ Joint Committee of Public Accounts and Audit, 'Parliamentary Delegation to New Zealand and Fiji by members of the JCPAA,' Report No. 455, February 2016, available:
http://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Recently_Tabled_Reports

SECTION 3 – CURRENT WORK PRIORITIES FOR THE ABS

Four broad strategic priorities are being pursued by the ABS for 2016-17: (1) delivering the 2016 Census of Population and Housing; (2) delivering and maintaining the quality of key statistics; (3) progressing data integration and microdata access; and (4) the second year of transforming the ABS for the future.

3.1 Delivering the 2016 Census of Population and Housing

The national 2016 Census of Population and Housing will be Australia's 17th Census. The Census is the largest statistical collection the ABS undertakes and the most significant. The Census requires a peak of 1,200 office staff and 38,000 field staff and was expected to cost around \$470 million over a five year period.

Further information on the 2016 Census is provided in Section 8.

3.2 Delivering and maintaining the quality of key statistics

A key priority for the ABS is to deliver and maintain the quality of key demographic and economic statistics.

Demographic statistics, including Estimated Resident Population (ERP), will remain a high priority. Estimating the resident population of Australia is a core activity under ABS legislation, and a critical input into economic indicators, electoral boundaries and allocation of Goods and Services Tax revenue to the states and territories. These statistics are underpinned by the Census.

The ABS is also prioritising the quality of key economic statistics, such as the National Accounts, Consumer Price Index (CPI) and labour force statistics, and statistics of importance to significant government outlays and public policy. These programs include statistics on health, disability, carers, Aboriginal and Torres Strait Islander peoples, education, business characteristics, innovation, agriculture, environment economic accounting, transport, tourism, labour demand and information and communications technology. Many of these statistics are funded by other government agencies.

Finally, sustaining the quality and efficiency of the household survey and business survey program, while driving best practice in centralised data collection through the establishment of a new National Data Acquisition Centre in Geelong will continue to be important in achieving an optimal balance between managing respondent burden and the high response rates expected of accurate, trusted official statistics.

3.3 Progressing data integration and microdata access

The ABS has prioritised safe data integration and improved microdata access as key to: remaining relevant in a dynamic information environment; delivering better statistical solutions in a

challenging fiscal environment; and meeting the growing expectations of key data users. More information is provided in Sections 2 and 11.

3.4 Transforming the ABS for the Future

The \$257m Government investment to modernise ABS infrastructure and business processes will reduce risks to statistical outputs; reduce costs; reduce red tape for providers; and achieve faster turnaround in dissemination of statistics. More information is provided in Section 2.5.

SECTION 4 – PRIVACY, SECRECY AND THE ABS

4.1 Importance of privacy and secrecy

Privacy is a foundation of all statistical agencies, and the ABS is no exception – protecting privacy remains the number one priority of ABS and its staff, and it is a requirement in the ABS’s governing legislation.

The ABS is committed to upholding the privacy and secrecy of all of the information it collects. Maintaining the trust and support of the Australian community is critical for the ABS to effectively carry out its functions, and is a key measure of organisational success set out in the ABS Corporate Plan¹.

The ABS has strong legislative protections founded in the *Census and Statistics Act 1905* that safeguard the identity of a particular person or organisation, and it has a proud history of more than 100 years of maintaining community trust in the way it safely collects, uses, discloses, and stores statistical data about people and businesses.

The *Census and Statistics Act 1905* secrecy provision requires that all information, including personal information, provided to the ABS remains strictly confidential and is never released in a manner which is likely to enable an individual to be identified. All ABS staff are legally bound never to release identifiable statistical information collected by the ABS to any external individual or organisation – including to courts and law enforcement agencies. This is a lifelong obligation which carries heavy penalties for breaches, including fines of up to \$21,600 or imprisonment for up to two years, or both.

In addition, as an Australian Government agency the ABS complies with the *Privacy Act 1988*² and handles personal information in accordance with the Australian Privacy Principles.

4.2 Privacy management in the ABS

‘Privacy by Design’ underpins information privacy management in the ABS. This means that privacy is intentionally considered, not on the fly. Privacy by design is part of the Privacy Management Framework guidelines³ advocated by the Office of the Australian Information Commissioner (OAIC).

There are seven foundational principles of privacy by design⁴ which are described below, within the context of how the ABS applies these principles.

¹ Available online at <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1005.0>

² Available online at <https://www.legislation.gov.au/Details/C2014C00757>

³ OAIC, ‘Privacy management framework: enabling compliance and encouraging good practice’, available: <https://www.oaic.gov.au/agencies-and-organisations/guides/privacy-management-framework>

⁴ Cavoukian. A, ‘Privacy by Design. The 7 Foundational Principles. Implementation and Mapping of Fair Information Practices’, available: https://www.iab.org/wp-content/IAB-uploads/2011/03/fred_carter.pdf

Principle 1: Proactive not reactive, preventative not remedial

The ABS has a clear commitment to set and enforce high standards of privacy; this commitment is shared by all ABS staff in a culture of continuous improvement; and the ABS has established up-to-date practices and methods to proactively and systematically address poor privacy design, to anticipate poor privacy practices and outcomes, and correct any negative impacts before they occur.

– *High standards*

The ABS has an up-to-date Privacy Policy and a Census-specific Privacy Policy to explain how personal information provided to the ABS is collected, used and disclosed.

All ABS policies and practices are subject to periodic review to enable and strengthen the internal mechanisms used to keep personal information secure and align with best practice. The ABS Privacy Policy was updated in 2014 to incorporate changes to the *Privacy Act 1988* and the introduction of Australian Privacy Principles. This change included regular mandatory training for all staff on privacy requirements. The ABS regularly promotes privacy legislation and obligations for all ABS staff, including through partnering with the OAIC in the annual Privacy Awareness Week event.

The ABS proactively engages with the OAIC as well as the State and Territory Privacy Commissioners, on a range of privacy, secrecy and confidentiality related matters. For example, the ABS has proactively engaged with the Information and Privacy Commissioners on issues such as the 2016 Census and the ABS data integration program.

The ABS also employs best practice in relation to privacy and information security by participating in the OAIC's voluntary data breach notification scheme by which the ABS proactively reports any data security breaches to the OAIC by considering reporting requirements on a case-by-case basis consistent with the OAIC's Guide to handling personal information security breaches⁵.

– *Culture of shared commitment*

The ABS has a strong culture of respecting and safeguarding the privacy of individuals and their information. This respect is embedded into all aspects of the ABS, from its corporate values to the daily business practices implemented by staff.

At a high level, respect for privacy is embedded the ABS's corporate values and governance, which underpin and guide all decisions, behaviours, and interactions with stakeholders. In particular, the ABS Corporate Plan highlights the ABS's adherence to the five APS Values, and its commitment to:

“making decisions about priorities and resource use which seek to maximise the public benefit, improving the accessibility of information to all, while protecting the confidentiality of sensitive information provided to us.”

Protection of privacy is also built into key business practices, as discussed above, and into training materials for all staff, both office-based as well as authorised collection officers.

⁵OAIC, 'Data breach notification – A guide to handling personal information security breaches', August 2014, available: <https://www.oaic.gov.au/agencies-and-organisations/guides/data-breach-notification-a-guide-to-handling-personal-information-security-breaches>

The importance of preserving privacy is emphasised by the Undertaking of Fidelity and Secrecy which all staff sign. This Undertaking legally binds signatories never to divulge any information collected under the *Census and Statistics Act 1905* to any individual or organisation outside of the ABS.

The ABS has an excellent record of data security and is committed to ensuring this continues into the future including for the 2016 Census. The prosecution and conviction of a former staff member for insider trading demonstrates that the ABS and the Australian judicial system have no tolerance for the malicious use of ABS statistical information and that the ABS will not hesitate to pursue all sanctions available when criminal acts are committed.⁶

- *Established and up-to-date practices and methods to proactively and systematically address poor privacy design, to anticipate poor privacy practices and outcomes, and correct any negative impacts before they occur*

The ABS has a considerable number of long established practices and methods that proactively and systematically address poor privacy design if it occurs, anticipate poor privacy practices and outcomes, and correct negative impacts before they occur. These include:

- New recruits undergo a police check and sign legally binding undertaking of Fidelity and Secrecy prior to commencing employment;
- physical and IT security mechanisms;
- mandatory training of all staff in privacy obligations as part of their induction process and throughout employment, i.e. mandatory training modules must be repeated periodically (e.g. biennially);
- access to data is provided to the smallest possible number of staff and is authorised only on a 'need to know basis' and limited to only the minimum set of information necessary for the conduct of official duties;
- auditing and monitoring of access to sensitive information including personal information;
- methodologies, tools and governance for ensuring ABS staff can meet their legal obligation to ensure no statistics or data which is released enables the identification of an individual or organisation. In particular, all ABS microdata products are considered by a senior level committee, the Disclosure Review Board, chaired by the ABS Chief Methodologist, following rigorous assessment of the risk of disclosing the identity of an individual or organisation. The Australian Statistician approves the release of all ABS microdata products on the recommendation of the Chief Methodologist.

Principle 2: Privacy is a default setting

Personal information collected, used, stored and curated by the ABS is protected by law and privacy protections are operationalised in ABS systems, business practices and processes. An individual does not have to proactively take any action to ensure their privacy is protected by information held by the ABS.

⁶ The insider trading case involved statistical aggregate and not information about individual persons or businesses.

Principle 3: Privacy is embedded in design

Privacy is embedded in the design and architecture of ABS information systems, business practices and processes that involve the collection and handling of personal information. It is built in at the requirement setting stage; it is not 'bolted on' as an afterthought. For example, the conduct of a Privacy Impact Assessment (PIA) is a standard part of the ABS Data Integration project approval process and personal identifiers are destroyed when they are no longer required.

Principle 4: Full functionality: positive-sum, not zero-sum

This principle seeks to ensure the compatibility of privacy and business functionality, including the desirability of having both without unnecessary trade-offs. The ABS culture and organisational strategy of privacy by design is considered to be a fundamental part of ABS business goals rather than an element that might compromise or detract from ABS business goals. The importance of privacy to preserving the ongoing trust of survey respondents and providers of data features in ABS corporate documentation and in ABS staff values. The ABS data integration capability developed over the past years is an excellent example of how statistical activity of the ABS can be enhanced in a manner that strengthens privacy protections (see Section 2.6 and 4.3 for further information).

Principle 5: End-to-end security – full lifecycle protection

Appropriate security measures are essential to privacy, from start to finish. This ensures that all personal information is kept securely across its lifecycle from collection through to destruction. The ABS's security arrangements are multi-layered and include protection against cyber-attacks, internal system access controls, the securing of ABS premises, training and monitoring of staff, the use of encryptions and, for statistical data integration, the separation of identities from the data.

ABS's security measures meet high standards, and are supported by strong internal security governance arrangements. Regular security reviews and audits are conducted to ensure security protections are in place - these include annual audits of security compliance requirements, certification of the ABS internet gateway, and commissioned ethical hacking against ABS systems.

The ABS maintains a high level of compliance with the Commonwealth Protective Security Policy Framework (PSPF). In accordance with the PSPF, the ABS also complies with the Australian Signals Directorate's Information Security Manual (ISM), and is implementing the mandatory *Top Four Strategies to Mitigate Targeted Cyber Intrusions*.

The ABS is confident that its current information security controls and risk mitigation strategies are sufficient to manage the security risks to ABS information and systems including the risk of a cyber-attack.⁷

Following a 2014 review of ABS sensitive information controls⁸ the ABS implemented stronger measures to reduce the risk of breaches of security. These stronger measures include:

⁷ The online Census DDoS attack of 9 August 2016 was against an IBM system not an ABS one. See Section 9 for further details.

⁸ Gibson, B, 'Review of ABS Sensitive Information Controls,' July 2014, available: <http://www.abs.gov.au/websitedbs/d3310114.nsf/home/ABS+responds+to+'Independent+review+will+help+>

- an annual conflict of interest declaration process required to meet the strict legislative requirements of the *Public Governance, Performance and Accountability Act 2013*. All staff are required to declare any conflicts of interest annually, and immediately upon commencing in a role that requires access to sensitive information. This control supports appropriate access (i.e. security of information)
- a 'clear desk, clear screen' policy, with compliance monitored through regular checks by Security officers. Penalties for non-compliance range from counselling through to investigation for a breach of the Code of Conduct (set out under Section 13 of the *Public Service Act 1999*), which provides for penalties ranging from a reprimand through to termination of employment
- mandatory training on ABS security practices. Additionally, all staff every 2 years receive an annual reminder of their obligations under their Undertaking of Fidelity and Secrecy and other applicable legislation which must be acknowledged by digital signature
- owners of sensitive data are required to review accesses granted to their data regularly and to retrospectively review staff that have accessed their data.

Principle 6: Visibility and Transparency

The ABS is transparent about its personal information handling practices, including the activities undertaken, the kinds of personal information collected and held, and the methods for collecting personal information. As mentioned earlier, PIAs are embedded in ABS Data Integration project approval processes.

The ABS Privacy Policy⁹ and Census Privacy Policy¹⁰ are on the ABS website. The ABS regularly releases products, including microdata product releases and underpinning methodologies, available on the ABS website.

Principle 7: Respect for user privacy – keep it user centric.

The ABS has strong privacy defaults, appropriate notice, and empowering user-friendly options. For each Census, for instance, the ABS provides notice well in advance of Census night of the nature and content of each Census.

The ABS has a legal obligation to never release personal information.

[ABS+maintain+a+strong+information+security+culture'/\\$File/A+Review+of+the+ABS+Sensitive+Information+Controls.pdf](#)

⁹ The ABS Privacy Policy is available online at

<http://www.abs.gov.au/websitedbs/D3310114.nsf/Home/Privacy?opendocument#from-banner=GB>

¹⁰ The ABS Census Privacy Policy is available online at

<http://www.abs.gov.au/websitedbs/censushome.nsf/home/privacypolicy>

4.3 Enhancing ABS capabilities in privacy-preserving technologies and capabilities

Evolving technology and methods are revolutionising traditional statistical approaches across the stages of data collection, processing, analysis and dissemination. The greater use of automated approaches is significantly reducing the cost, strengthening security and privacy protections while also improving the quality of linked datasets.

As outlined in Section 3, the ABS has prioritised data integration and improved microdata access as key to: remaining relevant in a dynamic information environment; delivering better statistical solutions in a challenging fiscal environment; and meeting the growing information requirements.

Investments over the past decade in privacy-preserving technologies and capabilities are enabling the ABS to develop new statistical solutions that have integrity, are timely and fit for purpose, and that maximise the value of public information, without ever compromising privacy.

Statistical data integration

As mentioned in Section 2, the ABS, like national statistical offices around the globe, has been adopting advances in technology, methodology and analytical capability to deliver more relevant and cost-effective statistical solutions.

Evolving technology and methods have replaced the need for manual matching of data records across different data sources, in a way that could not have been envisaged even two decades ago. The developments of ABS's statistical data integration capabilities are providing alternative, less intrusive solutions to costly traditional survey approaches in many instances.

These opportunities are made possible through methodological innovations in the 1990s and early 2000s that saw the development of both deterministic and probabilistic statistical approaches for record linkage between data sources (refer Box 4.1). These developments have paved the way for effective and efficient data integration practices. In particular, they have enabled the introduction of more automated data linking to replace manual matching process. Automatic data linking has significantly reduced the cost, strengthened the security and improved the quality of the resulting statistics.

Box 4.1 Development of deterministic and probabilistic linkage methodologies

Deterministic linkage is a rules-based method that links records from different data sources if they match exactly or within specified tolerance levels on unique identifiers (for example, ABNs) and/or a set of variables (for example, name, date of birth, marital status and address).

Probabilistic linkage is a method that determines the likelihood that a pair of records are a match based on how well they agree on a set of variables and then uses statistically valid decision rules to designate which record-pairs are matches, possible matches and non-matches. When calculating the likelihood that a pair of records are a match, the discriminatory power of each variable being used for linking and also the fuzziness in agreements between the linking variables are taken into account.

Probabilistic linkage is more statistically reliable and theoretically justifiable but deterministic linkage strategies are more suitable for production of linked datasets.

In 2002, the ABS developed deterministic record linkage approaches to build the ABS Business Register which uses the shared common identifier of ABN to bring together data from the Australian Business Register with business taxation data at the business entity level. The resulting dataset is a list of organisations which undertake economic activity in Australia. This data set is deterministically linked to other economic data sets to provide official statistics about businesses.

In 2005, the ABS commenced the development of dedicated methodological expertise in probabilistic record linkage through the establishment of the ABS's Census Data Enhancement program (refer Section 11 and Appendix 11 for more information).

Quality studies using names and addresses from the 2006 Census built expertise in statistical methodology for linking data sources that did not contain a unique identifier, such as the ABS on the Australian Business Register, by comparing the difference in quality between linking with and without name and/or address information. For example, to calculate life expectancy, death registrations were linked to the Census. A quality study showed that using name and location resulted in a linkage rate of about 95%, which generated a very high quality linked dataset for statistical purposes. The same quality study showed that when name information wasn't used, a linkage rate of 81% was achieved, with even lower linkage rates for important sub-groups such as:

- Aboriginal and Torres Strait Islander people;
- people living in remote and very remote regions;
- residents in the Northern Territory; and
- persons aged under 50 years.

As outlined in Section 2, the ABS also began investing in a dedicated data integration facility in 2005 which has enhanced the internal mechanisms the ABS uses to keep personal information more secure, over and above the ABS's already strong protections. The facility was subsequently independently accredited¹¹ as a Commonwealth data integration facility in 2012 against the following criteria, many of which directly relate to the preservation of privacy:

- ability to ensure secure data management
- demonstrated ability to ensure that information that is likely to enable identification of individuals or organisations is not disclosed to external users
- availability of appropriate skills
- appropriate technical capability
- lack of conflict of interest
- culture and values that ensure protection of confidential information and support the use of data as a strategic resource
- transparency of operation
- existence of an appropriate governance and institutional framework.

The ABS's data integration facility only undertakes data integration for statistical and research purposes and where there is a strong public benefit in doing so. Data for statistical purposes cannot be used in a way that has a direct affect on the individual other than in relation to developing statistical insights about groups of people. For example, because identifiable information is not provided it cannot be used in administrative processes to identify individuals who are, or are not, eligible for welfare services, nor to assess an individual's compliance with requirements such as those of the Australian Taxation Office or a Court of Law.

The ABS requires all data integration project proposals to go through a rigorous assessment and approval process to ensure the project provides a significant public benefit and takes a privacy-by-design approach. In addition, staff members assigned to a project are never able to see all of an individual's information together at any point of the data integration process and data access rights are only provided on a 'needs to know' basis – this is known as the 'separation principle'. These protections are in addition to existing strong protections that all ABS staff are legally bound to never release personal information to any individual or organisation outside of the ABS.

Investments in ABS data integration capability and methodological expertise over the past decade are seeing strong demand from governments and researchers to extract greater statistical value from the ABS data integration facility. The ABS is transitioning from undertaking a small, discrete array of data integration projects to a rich, diverse and expanding program of projects across social, economic and environmental domains in a secure fashion that protects privacy. More information is provided in Section 2.3, Section 11 and Appendices 5 and 6.

¹¹ A copy of the accreditation claims made by ABS, which have been verified by an independent auditor, is available through the [National Statistical Service](http://www.nss.gov.au/nss/home.nsf/pages/Data%20Integration%20-%20ABS%20accreditation%20application%20and%20audit%20summary) website - <http://www.nss.gov.au/nss/home.nsf/pages/Data%20Integration%20-%20ABS%20accreditation%20application%20and%20audit%20summary>

Safe dissemination capabilities

Around this time, investments were also made by the ABS in privacy-preserving dissemination capabilities. The ABS implemented sophisticated methodologies to the secure and safe use of ABS microdata that better met the needs of users. These methodologies were embedded into technologies (e.g. ABS TableBuilder) to enable dynamic confidentialisation of tabular output using perturbation techniques prior to statistical results being returned to the user. The primary advantage of this technique is that the impact on overall data quality of the confidentialisation routine is minimised by applying the necessary modifications only to the final output and not to the underlying data source.

These advances in dissemination tools have enabled the ABS to significantly improve Australia's evidence base whilst maintaining the confidentiality of the data. These privacy-preserving dissemination capabilities have also been sought by other government departments seeking mechanisms to safely and effectively disseminate data for statistical and research purposes.

The ABS has leveraged the capability in TableBuilder to safely disseminate integrated research datasets to approved researchers. For example, the Australian Census Longitudinal Dataset is available in TableBuilder and has been used by more than 8,000 registered users without a single privacy breach.

The ABS is committed to continuing to invest in privacy-preserving dissemination capabilities. In this regard, the ABS is facilitating safe access to appropriately de-identified and confidentialised microdata through the Five Safes framework. This framework unlocks the value of existing data while preserving the privacy and confidentiality of individuals.

The Five Safes Framework has been adapted from the UK model. The Five Safes cover:

1. safe people
2. safe projects
3. safe settings
4. safe data
5. safe output.

Taken together, the Five Safes ensure that a comprehensive assessment is undertaken and that appropriate controls are put in place prior to data access being given. This ensures data is not able to be used in a way that is likely to enable the identification of any individuals or organisations.

Figure 4.1 - The Five Safes Framework



SECTION 5 – INTRODUCTION TO CENSUS OF POPULATION AND HOUSING

A Census of Population and Housing (“Census”) is an official count of the complete population and the dwellings in which they live. A Census provides a detailed snapshot of the population and dwellings, at a point in time. The United Nations characterise the role of Censuses in the following way:

“Evidence-based decision-making is a universally recognized paradigm of efficient management of economic and social affairs and of overall effective governing of societies today. Generating relevant, accurate and timely statistics is a sine qua non of this model; producing detailed statistics for small areas and small population groups is its foundation.

The role of the population and housing census is to collect, process and disseminate such small area detailed statistics on population, its composition, characteristics, spatial distribution and organization (families and households).”¹

The *United Nations Principles and Recommendations for Population and Housing Censuses*¹ outlines the essential features of a Census to be:

- counting each person and household individually
- universally cover all persons and households in the defined area
- having a specified common reference point (e.g. Census night)
- undertaken at least every 10 years,
- producing statistics for small geographic areas and population group.

The Australian Census provides a reliable basis for the estimation of the population of the states, territories and local government areas, for use in: determining the number of seats allocated to each state and territory in the House of Representatives; distributing billions of dollars of annual goods and services tax revenue to the states and territories; and influencing grants to states and to local government areas.

These important uses are only part of the role of the Census. As well as key demographic characteristics such as age and sex, the Census collects information about the housing of people in Australia, and other topics such as education, participation in the labour force, occupations and industries, marital status and family size. Topics can be analysed individually and in conjunction with other topics. The value of Census data is summarised in Box 5.1.

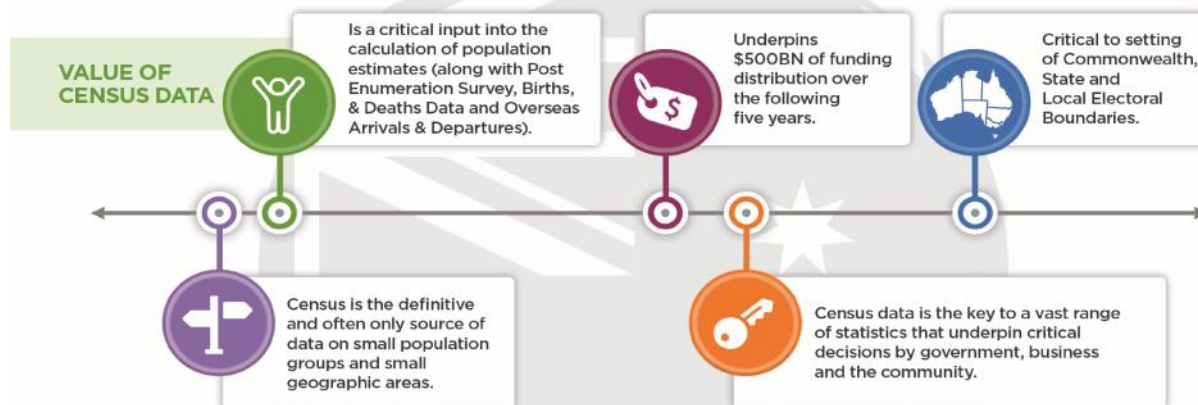
The introduction of household sample surveys in the 1960s has allowed the examination of population and household topics in greater detail about a subject. However, a Census has remained critical to providing quality information about small population groups and small geographic areas.

¹ *United Nations Principles and Recommendations for Population and Housing Censuses, Revision 3* - Sales No. E.15.XVII.10.

Box 5.1 - The value of Census data



COMPREHENSIVE SNAPSHOT Public consultation on the 2016 Census received more than 1,000 submissions, requesting 54 new topics as well as the retention of current 45 topics. 1911 Census: 18 questions
2016 Census: 61 questions



2011 CENSUS DATA STORIES

- ✓ 2011 Census data were used to study ageing, mining industry, labour force participation, cultural diversity and religious beliefs, internal migration, year 12 completion and higher education, homelessness, same-sex couples, travel to work and much more...
- ✓ Australia's largest longitudinal dataset - data linking of 1 million records between the 2006 and 2011 Census provided accurate estimates of Indigenous life expectancy, settlement outcomes of migrant groups, vocational education and training outcomes, and demographic and geographic analysis of mental health services. The public value of this dataset will increase with the addition of 2016 Census data.

SECTION 6 – CENSUSES IN AUSTRALIA – A BRIEF HISTORY

Australia has a history of regular population stocktakes from the time of the first British settlement. From 1788, stocktakes occurred to manage colony resources and musters were held regularly from 1795 to 1825.

In 1828, the first regular Australian Census was held in NSW and by the late 1800s, Censuses of all Australian colonies were held on the same day.

Post Federation, the Australian Bureau of Statistics has regularly conducted Censuses. The first national Census was conducted in 1911 and the seventeenth in 2016. On the first national Census, the then Commonwealth Statistician, Sir George Handley Knibbs stated:

'The Census gives us not only a vivid photograph of the present, but with past censuses, shows also the direction in which we are travelling and the rate of progress we are making'

Commonwealth Bureau of Census and Statistics (CBCS),

Notes by G.H. Knibbs, 1911.

6.1 Census Legislation and Frequency

In 1905, the *Census and Statistics Act 1905* was passed to provide greater coordination of census taking. Consistent with the *Act*, the first national Census was undertaken in 1911, and was to be held every ten years thereafter.

The Census is compulsory. The *Census and Statistics Act 1905* specified the requirement to answer all questions, with the exception of religion, and that a penalty would apply for any untrue answers. Subsequent redrafts of the legislation have not removed the compulsory nature of the Census, nor the requirement to complete fully and accurately.

The second Census was undertaken in 1921. Due to the economic depression, the *Census and Statistics Act 1905* was amended to allow a Census to be held at any such time as prescribed, and the third Census was undertaken in 1933. No Census was held during the period of World War II and the first post-war Census was taken in 1947, after an interval of 14 years. The year 1954 was chosen for the next Census, it being a seven year interval and equidistant between the 1947 Census and the then proposed 1961 Census.

Following the 1961 Census, Australia has had a Census taken every five years, a practice which became mandatory with an amendment to the *Census and Statistics Act* in 1977.

Although the Census is compulsory, the ABS relies on the willing cooperation of Australians to conduct a successful Census. While fines for the failure to complete a form can be issued by a Court, this measure is used sparingly. For the 2011 Census, fewer than 100 persons were prosecuted for failing to complete a form.

The Census of Population and Housing has collected names and addresses on a compulsory basis since 1911. The ABS considers names and addresses as statistical information that can be lawfully collected and used for statistical purposes. They are an essential part of the Census statistical process and have been for over 100 years.

In 2016, the ABS sought legal advice to reaffirm this understanding and support the lawful collection of the Census. The advice from the Australian Government Solicitor supports that in conducting the 2016 Census the ABS has been, and continues to be, compliant with all relevant legislation.

The ABS has enjoyed high response rates to past Censuses. For example, the 2006 Census had a 95.8% response rate for persons, and the 2011 Census a 96.3% response rate for persons¹. More information on the calculation of response rates and key measures of statistical quality are provided in Appendix 7.

6.2 Census Content

The person and household topics to be collected with the Census are specified in Regulations by the Government².

The first Australian Census had nineteen topics. The majority of these topics have remained as part of every Census since – including name, address, sex, date of birth, marital status, number of children, relationship to head of household, birthplace, nationality/ancestry, education, occupation, type of dwelling and religion question (always optional).

The Census has collected names and addresses on a compulsory basis since 1911. The collection of names is a critical part of ensuring the quality and value of the Census. Names assist householders completing the Census form to report the relevant information for each person, and ensure that everyone in the household is included. The collection of names and addresses supports follow-up activities leading to higher quality information for official statistics. Addresses are collected to ensure that households are allocated correctly geographically which is used to generate population and demographic statistics for States and Territories and regions within them.

Since the introduction of the Post Enumeration Survey in 1966, names and addresses have been critical to the measurement of the accuracy of the Census, and allowing for adjustments for under and over counts in the estimation of official population estimates.

Since 2006, names and addresses have also supported the enhancement of the value of Census data through assisting data integration with other national datasets to produce valuable statistics. For more information see Section 11.

The content in the Australian Census has gradually increased over time (refer Figure 6.1).

¹ The response rate for occupied dwellings was 95.8% for the 2006 Census and 96.5% for the 2011 Census.

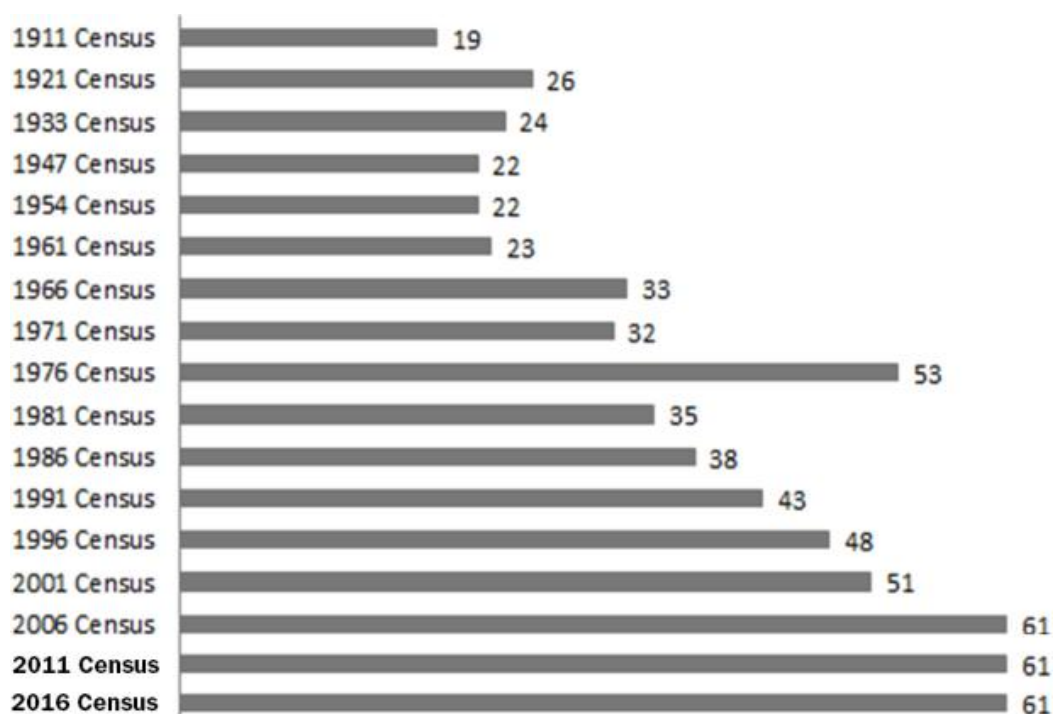
² *Census and Statistics (Census) Regulations 2015* (Cth), available: <https://www.legislation.gov.au/Details/F2015L02028>

The 1976 Census had a significant expansion of topics, most of which were removed before 1981 and many that have never been re-added (e.g. Holidays, Life Insurance and Motorbike licences).

Topics have been removed from the Census when there is no longer sufficient justification for their inclusion – for example duration of blindness/deaf-mutism (last collected 1933), unemployment duration (last collected 1961) and wall construction materials (last collected 1981).

The last three Censuses (2006, 2011 and 2016) have contained the same topics. There is significant demand for additional topics, such as information on long term health conditions. The inclusion of any new topic needs to consider the significant cost, the burden on households, the limitations of the size of the paper form, and the continuing need for other existing topics. It also needs to be specified in the Regulations².

Figure 6.1 - Number of Census topics over time, 1911 - 2016




See Appendix 8 for details on the 2016 Census topics. A summary of selected Census facts overtime is provided in Figure 6.2.

6.3 Census Innovation

The Census in Australia has a history of innovation and adoption of technology. The 1921 Census introduced mechanical machine tabulation, with equipment loaned from England for the period of the Census.

In 1966, some of the earliest computer technology in Australia was used to process Census data. In 1986, Census data was released on CD-ROM, and for a period the ABS was the leading importer of

Figure 6.2 - Censuses in Australia - Selected Facts

CENSUSES IN AUSTRALIA FACTS							
	1911	1996	2001	2006	2011	2016
Census date	April 2-3		August 6	August 7	August 8	August 9	August 9
National Census	1st		13th	14th	15th	16th	17th
People counted in the Census	4,455,005		17,892,423	18,972,350	19,855,290	21,507,717	
Census is compulsory	✓		✓	✓	✓	✓	✓
Penalties existed for refusal to complete the Census	✓		✓	✓	✓	✓	✓
Names collected in the Census	✓		✓	✓	✓	✓	✓
Addresses collected in the Census	✓		✓	✓	✓	✓	✓
Names and addresses retained for processing and ensure no one is counted twice or missed in the Census	✓		✓	✓	✓	✓	✓
Option to retain name, addresses and Census information for 99 years ¹	✗		✗	✓	✓	✓	✓
Collection period for Census over a number of weeks	✓		✓	✓	✓	✓	✓
Online Census form available	✗		✗	✓	✓	✓	✓
% of households who completed the Census online	✗		✗	0.00% ²	10%	33%	Target 65%
Realtime collection response monitoring	✗		✗	✗	✗	✗	✓
Promotions/Advertising to build awareness	✓		✓	✓	✓	✓	✓
Mail out of Census letters with Logins	✗		✗	✗	✗	✗	✓
Anonymised Census data connected with other datasets to address important questions about Australian society	✗		✗	✗	✓	✓	✓
Longitudinal linkage of Census data available	✗		✗	✗	✗ ³	✓	✓
Anonymised Census data connected with other datasets for compliance or tracking purposes (e.g. welfare payments, tax returns, child support, etc.)					Never		
Detailed Census data available on ABS website	✗		✓ \$	✓ \$	✓ FREE	✓ FREE	✓ FREE
First release of Census data after Census night	~ 3 Years (September 1914-1917)		10 Months (1 July 1997)	10 Months (17 June 2002)	10 months (27 June 2007)	10 months (21 June 2012)	8 months (April 2017)
Number of field staff	7,300		30,000+	32,000	43,000	43,000	38,000
Improve undercount of special populations through additional activities (i.e. Special teams visit and assist homeless to complete and be counted)	✗		✓	✓	✓	✓	✓
Intersex option available	✗		✗	✗	✗	✗	✓ (online option on request)

¹ Retained by National Archives of Australia.

² Online Census Form available but very small numbers returned.

³ First sample of the Australian Census Longitudinal Dataset Taken.

CD-ROM drives in Australia as organisations were purchasing their first CD-ROM drive in order to receive their Census data.

In 1991, the ABS introduced optical mark recognition to increase the speed and accuracy through scanning Census forms, and in 2001 the ABS was using Intelligent Character Recognition to capture text as well as check-boxes.

In 2001, the ABS introduced an online Census form which was available on request but was not publicised. Only 0.01% of households took up this option.

In 2006 the ABS offered an online Census form for the first time to the general public. The take-up rate was 10 percent of households. The ABS was presented with an International Laureate Gold Medal for eCensus 2006.

In 2011, the ABS increased use of the online Census form and engaged heavily with digital engagement strategies and social media. The take-up rate for the online Census was 33% percent of households.

The ABS Census Program has won the Australian Government's eGovernment Award in 2007, 2013 and 2014, and also was a finalist in 2009 and 2011. The ABS's success in the 2011 Census was recognised with the Prime Minister's Gold Medal for Public Innovation Excellence.

6.4 Challenges with the traditional Census model

The traditional Census model of visiting homes to drop off and pick up Census forms has been used for the past one hundred years but it has become increasingly difficult to maintain this approach and technology can provide improved solutions for many.

The traditional approach to the 2011 and previous Censuses was reliant on increasing the number of field staff in order to deliver and collect forms or online access codes from every dwelling. Recruiting a sufficient number of staff required for the short-term field operation has become more difficult; and staff costs have escalated. In 2011, there were a number of areas where sufficient field staff could not be recruited and the ABS needed to fly in higher paid ongoing employees. In addition, with decreasing numbers of people in each household and an increased proportion of the population that is in the workforce, Census collectors have had decreasing success in contacting people at their homes. Some dwelling types such as secure apartment buildings are particularly problematic for hand delivery and collection of materials.

The traditional approach also led to uneven data quality across the nation. The absence of centralised management information meant there was limited ability to identify potential data response issues in specific locations until after the Census was complete, and thus too late to respond to. Analysis of the 2011 Census showed that 9% of statistical area 2s (areas of approximately 10,000 people) had dwelling response rates of under 93.5%, and over 4% of these had response rates below 91.0% - meaning data at this level is less reliable and less representative.

Finally, the role of Census data had been evolving since 2006 as not just an independently valuable data resource, but a key enabler of statistical insights through data integration. In order to meet the increasing national need for timely, relevant and responsive statistics it was critical that the ABS continue work on enhancing the value of Census and other data through data integration.

More information on how Census data has been used to add statistical insights through data integration, including examples, can be found in Section 11.

6.5 Privacy debates and the Census

There is a long history of privacy debates and the Census in Australia. The 2005 ABS history book titled *Informing the Nation* states:

*A citizen's right to privacy, in contrast with the needs of government and the people for information on all Australians has been a fundamental issue for the ABS since its inception.*³

Perhaps the most heightened Census privacy debates occurred in the 1970s. At the time of the 1971 Census, there were protests and dissent over the Census in the media. This public discussion was generated by a television show on the privacy of personal information held by governments shown one month before the Census. Major newspapers and one political party questioned the inclusion of names on the Census form.

These debates also came at a time when there was a substantial change in sensitive topics and discussion around the inclusion of topics judged by some to be sensitive, such as income, 'handicaps', holidays, child care, life insurance, vehicle licenses and government payments.

Five years later, the debates around the value and purpose of the Census and the importance of privacy led to a review by the Law Reform Commission. In April 1976 (prior to the Census of that year) the then Treasurer asked the Law Reform Commission to make recommendations that considered Census privacy. The Law Reform Commission examined issues such as:

- whether sampling techniques could replace the full enumeration approach taken in a full Census
- whether a voluntary or anonymous Census would produce an acceptable level of quality information
- whether the penalty for failing to provide Census information of \$20, set down in 1905, should be increased;
- the need for an intensive publicity and advertising campaign
- the necessity for compelling reasons to collect information in a Census
- the prescription of Census topics in the regulations to ensure that privacy considerations are taken into account when determining the questions to be asked in a Census.

³ Australian Bureau of Statistics, 2005, [Informing the Nation: the Evolution of the Australian Bureau of Statistics](http://www.abs.gov.au/ausstats/abs@.nsf/ca79f63026ec2e9cca256886001514d7/3ce5239b73e238f5ca25707500752efb!OpenDocument), cat no. 1382.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/ca79f63026ec2e9cca256886001514d7/3ce5239b73e238f5ca25707500752efb!OpenDocument>

Following this major investigation, the Law Reform Commission endorsed the importance of the Census and agreed that the processes used were appropriate, including the requirement to supply names. A number of improvements were suggested and agreed - all of which are still in place today. They are:

- Extensive publicity campaigns
- No fines unless reasonable warnings are given and an increase to the penalties for breach
- Only ask sensitive questions if there is a compelling case
- Availability of personal forms for individuals in households
- Allowing the release of microdata provided that all chance of identification has been removed.

The Commission also examined the suggestion that the Census might be conducted on an anonymous basis. It concluded that *“an anonymous Census, like a voluntary one, would result in an unacceptable level of non-response and an equally unacceptable bias in responses. It would inhibit or prevent the conduct of the post-enumeration survey whose function is to assess the accuracy and completeness of census responses.”*⁴

This conclusion was made as a result of tests conducted by the ABS between 1974 to 1978 which found *“the evidence from field tests carried out by the ABS, like that found in the literature, does not lend support to the theory that people are more willing to respond in an anonymous collection, or that their answers will be any more accurate. The opposite in fact appears to be the outcome. If names are not required on the census schedule, the threat of penalty for non-compliance is diminished and hence response rates fall significantly. From the studies done, accuracy of the answers does not appear to be affected by the anonymity or otherwise of the system. This was found to be true even for the income question, which is regarded as being the most intrusive question on the schedule”*.⁵

The 1981 Census implemented the recommendations from the Law Reform Commission with a focus on reducing the length of the form and minimising the information required from the public.⁶

Later in the 1980s, genealogists mounted a campaign to “save the results of the 1986 Australian Census for future historical and genetic research”.⁷

Following an Inquiry undertaken by the House of Representatives Standing Committee on Legal and Constitutional Affairs and the National Archives of Australia, the Government announced in December 1999 their decision to offer the Australian people a choice of having their names, addresses and Census information retained by the National Archives of Australia and released for research purposes after 99 years. The Committee’s recommendation and the subsequent Government decision did not reflect the ABS views at that time.

⁴ The Law Reform Commission, Report No. 12, ‘Privacy and the Census,’ Canberra, 1979, available: <https://www.alrc.gov.au/sites/default/files/pdfs/publications/alrc12.pdf>

⁵ ABS Confidentiality and Privacy Reports, 1978 provided to the Law Reform Commission.

⁶ Australian Bureau of Statistics, 2011, ‘Reflecting a Nation: Stories from the 2011 Census,’ cat no: 2071.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2071.0main+features2February+2011>

⁷ The Canberra Times, 29 April 1985

The decision was implemented in the 2001 Census. The optional retention question asks whether each person in the household agrees to have their personally-identified information kept and securely held by the National Archives of Australia for 99 years. After 99 years, the name-identified data will be made public for future generations. This option is called the “Census Time Capsule”.

This decision brought Australia in line with a long international history of retaining Census information. As reported back in 1979 “The Australian practice of destroying census forms and all records of names and addresses is unusual, if not unique”⁸. For example, the United States has retained Census information as far back as 1790, with a 72-year restriction on access to Census information^{9 10}, while the first available UK Census with the names of every individual is 1841¹¹. New Zealand also retains Census information, and while the decision to retain Census forms has changed a number of times in their history¹², they have some selected regional and Māori census records from as far back as 1864¹³.

In Australia, there has generally been a high take up of this option in the 2001, 2006 and 2011 Censuses, with 52.7%, 56.1% and 60.6% of households, respectively, electing to have their personally identified Census information retained by the National Archives of Australia.

Privacy debates were also in the public domain in the lead up to the 2006 Census, following the ABS proposal to create a statistical longitudinal census dataset comprising 100% of Census records (further outlined in Section 11). The ABS commissioned an independent Privacy Impact Assessment, made public in June 2005, which found no objectively ‘correct’ assessment of the privacy risk posed by the proposal. *“For many, the Proposal [to combine all data from the 2006 Census with future censuses] was likely to be seen as no more than a marginal change in the way in which the Census data is processed and used.... However, some will see the Proposal as a radical departure from established practice.”*¹⁴

At that time, the Australian Privacy Foundation ran a ‘campaign’ around “three significant privacy concerns arising out of the 2006 Census”:

- the linkage of people's Census records over time
- the introduction of the e-Census

⁸ The Law Reform Commission, Report No. 12, ‘Privacy and the Census,’ Canberra, 1979, available: <https://www.alrc.gov.au/sites/default/files/pdfs/publications/alrc12.pdf>

⁹ National Archives (US), <http://www.archives.gov/research/census/> (accessed 13 September 2016)

¹⁰ The National Archives (UK), <http://www.archives.gov/research/census/> (accessed 13 September 2016)

¹¹ Details from recent Census files can be released in the form of official transcripts to the named persons, their heirs or legal representatives

¹² Statistics New Zealand, <http://www.stats.govt.nz/Census/2013-census/info-about-the-census/intro-to-nz-census/history/did-you-know/historic-forms.aspx> (accessed 13 September 2016)

¹³ Archives New Zealand, http://archives.govt.nz/research/questions-answers-general-lists#Census_records (accessed 13 September 2016)

¹⁴ Pacific Privacy Consulting, 2005, ‘Census Data Enhancement Proposal: Privacy Impact Assessment Report for Australian Bureau of Statistics, available: [http://www.abs.gov.au/websitedbs/D3110124.nsf/24e5997b9bf2ef35ca2567fb00299c59/fa7fd3e58e5cb46bc2571ee00190475/\\$FILE/ATT1UQCI/Privacy%20Impact%20Assessment%20report_1.pdf](http://www.abs.gov.au/websitedbs/D3110124.nsf/24e5997b9bf2ef35ca2567fb00299c59/fa7fd3e58e5cb46bc2571ee00190475/$FILE/ATT1UQCI/Privacy%20Impact%20Assessment%20report_1.pdf)

- the "Time Capsule" project¹⁵.

At the same time the Australian Privacy Foundation were campaigning around the e-health patient record and the consumer credit reporting.

Over the course of time since 1905, the ABS has made judgements seeking to consider its role to produce quality statistics for the nation with an individual's right to privacy, and to the greatest extent possible seeking to not compromise either of these important dimensions.

Judgements have been made by the ABS at different times that reflect contemporary perspectives across a number of dimensions including:

- the types of statistics that could be produced, or information value sought through retaining Census data or expanding its use
- the technical capability and practices of the ABS to use personal information safely to produce statistics
- the resource cost to the ABS, government and taxpayers of contemporary statistical practices and data retention at the time.

The environment in 1996 and for earlier Census collections was very different to that operating after 2006 across all three dimensions. For example, compared to the retention of information on microfiche, current technologies have substantially reduced the cost of processing and storing data securely, including the ability to separately store names and addresses from other Census content.

As discussed in Section 4.3, the ABS now has a state-of-the-art privacy-preserving data integration facility that has been developed and enhanced over the past decade but was not available in the last decade. This capability is already demonstrating the additional statistical information that can be produced on economic and social changes and assessing the effectiveness of government programs, delivered through the safe use of Census data. These important public policy uses go well beyond the family history purposes that were the primary focus of the public debate in the 1990s.

¹⁵ Australian Privacy Foundation, 'Privacy concerns with the 2006 Census', available: <https://www.privacy.org.au/Campaigns/Census/>

SECTION 7 – INTERNATIONAL TRENDS IN CENSUS

Demographic and social statistics are collected and compiled by a variety of methods across the globe, with nearly all United Nations Member States (193 states) conducting a complete population count at some time in the past ten years. The Census is the cornerstone for the statistical system, government administration and democracy in most countries of the world. The ABS understands that in all countries the Census is compulsory.

To the ABS's knowledge, names and addresses are collected in all countries as part of their Census, and used as a critical part of Census quality processes. In developed countries, names and addresses are now commonly retained indefinitely in order to enhance the quality of data integration for statistical and research purposes. A number of countries (e.g. the United Kingdom (UK), the United States of America (USA)) routinely make identified Census available for all persons after a period of time – in the UK this is 100 years and the USA it is 72 years.

The ABS engages extensively with comparable countries in order to ensure that world best practice is implemented in Australia. In particular, the ABS works closely with the Census Programs in Canada, Netherlands, New Zealand, the UK and the USA. The ABS has adopted many innovations that have been developed and successfully used in these other nations, and likewise the ABS has provided world leadership in a number of areas. In particular, the success of ABS's innovations in 2016 in relation to flexibly deploying its field workforce, monitoring and adjusting strategies in real-time, and the use of mobile devices by the field workforce are already being studied and will be adopted by a number of other nations in their next Census.

Three trends are apparent internationally:

- First, countries are moving away from the traditional Census model to make greater use of administrative data and, in some instances, completely replacing traditional Censuses with data compiled from administrative data and registers
- Second, countries are increasingly seeking to integrate Census data with other datasets to facilitate the better understanding of the society, economy and environment
- Third, countries are taking advantage of new technologies (such as online collection of data) to improve the efficiency and quality of Census operations.

7.1 Use of administrative data and registers

The 2010 round of Censuses saw a sizeable number of countries or areas developing and implementing alternative methodologies to the traditional (direct collection) census as the source for compiling comprehensive socio-economic statistics at the small area level and for small population groups.

Within the United Nations Economic Commission for Europe (UNECE), during the 2010 round of Censuses, 64% of nations conducted their Census using traditional Census methods of surveying the population, whilst 36% using either population registers or a combination of administrative data and traditional methods. By 2020, only 46% of these nations expect to continue using solely a traditional

method (with 29% of these nations expecting to draw their Census results from a population register of some kind).

In addition to the potential for administrative data and registers to replace the traditional collection methodology for Census, in most developed nations the value of Census data is being extended through data integration. In a survey of UNECE nations on the 2010 round of Censuses, integration with administrative records had been listed by 43% as being something they had done to reduce Census cost and 50% indicated that it was used to increase Census benefit.¹

Most developed nations are moving away from the approach that is used in Australia, where Census data is almost entirely reliant on direct collection from citizens rather than using existing alternative datasets. The Australian approach has the greatest burden on citizens, greatest cost and in some areas, limits data quality (much greater quality data on income could be sourced from administrative records than can be asked for in a self-completed Census form).

The Census Data Enhancement program established in Australia in 2005, where Census data has been linked to other ABS and government data sets, is very limited in scope, quality and value in comparison with similar nations. Australia has taken a conservative approach with data integration to extend the value and use of Census data for a wider range of statistical purposes.

7.2 Use of technology

There has been significant technical innovation in international Censuses in order to reduce costs and improve effectiveness. The most common areas of innovation are greater use of geospatial technologies and GPS, use of address registers and postal services, use of internet collection, and use of mobile devices to assist field interviewing or non-response follow up.

Australia has been a world leader in most areas (adoption of online forms in 2006, US Census Bureau will introduce its first online Census form in 2020) and mobile devices (significant bring your own device deployment in 2016). In other areas such as the use of an address register, other nations have introduced these significantly earlier than Australia (where the address register was introduced in 2016).

The 2016 Australian Census has adopted a number of proven international approaches to Census taking, including –

- The use of address registers for the mail out of materials and to facilitate non-response follow up (in use in US, Canada and UK, planned for NZ);
- The mailback of completed paper Census forms (in use in Canada and UK – planned for US and NZ);
- The use of reminder letters (in use in Canada – planned for US, UK and NZ);
- Online as the first option for response (in use in Canada – planned for US, UK and NZ); and
- Longer Census completion period (in use in Canada, US and UK).

¹ http://www.unece.org/fileadmin/DAM/stats/publications/2013/Measuring_population_and_housing_2010.pdf

7.3 International Examples

The following section provides an overview of how censuses are conducted in Canada, Netherlands, New Zealand, United Kingdom and the United States and directions being considered by these countries for future Censuses. It also explores the ways in which countries are extracting more public value and statistical insights using Census data safely integrated with other key data sets. In all of these nations, names and addresses are an essential part of the Census collection and maximising Census benefits.

Canada

Statistics Canada conducts a five-yearly Census and is considered a world-leader in Census taking. Statistics Canada's 2016 Census was very similar in design and process to the Australian 2016 Census including a mail out and digital-first approach. Statistics Canada's Census completion period is even longer than in Australia (11 weeks, compared to our 7 weeks). In 2016, Statistics Canada also experienced an outage of their 2016 online form. However, this was due to load/capacity rather than a Denial of Service attack. Statistics Canada has recently announced that they expect the 2016 Census to be their most successful ever.

The 2016 Statistics Canada Census combines a short form that is completed by the entire population, and a long form that is completed by a population sample. Statistics Canada complements its Census and survey program with a range of administrative sources, and has replaced the direct collection of income on the Census with the use of tax records. Statistics Canada has recently completed the enumeration of the 2016 Census, but has announced that they are investigating alternatives, including the establishment of a 'virtual population register' to replace the conduct of a five-yearly Census at some point in the future. Statistics Canada retains names and addresses permanently from each Census. For the 2011 Canadian Census, the Government decided to drop the long-form in favour of a voluntary National Household Survey because of privacy concerns. (The short-form remained compulsory). This decision was controversial and in 2015 the Government restored the mandatory long-form Census for a sample of the population in order to provide high-quality data.

Netherlands

The last traditional Census in the Netherlands was conducted in 1971. Because of privacy concerns that were prevalent in a number of European countries, including Netherlands, at the time, there was an indefinite postponement of the 1981 Census. Since then, Statistics Netherlands has moved to the use of their population registers, which is complemented by household sample surveys. In 2011, Statistics Netherlands conducted their Census with 15 staff and a budget of 1.4 million euros.

Statistics Netherlands have created a Social Statistical Database (SSD) through integrating national registers and surveys. The SSD is a comprehensive data set with coherent and detailed demographic and socio-economic data on persons, households, dwellings, jobs, and benefits. This enables the delivery of a wide array of timely statistical information on key national issues.

The advantages of the Netherlands approach to the Census include its relatively low cost, short production time, fewer non-response issues, and the ability to run a "continuous" census.

Disadvantages include the dependence on register authorities, timeliness of registers, differing concepts and collection methodologies, and challenges in enumerating small subpopulations.

New Zealand

Censuses in New Zealand have generally been undertaken every five years. However, significant public reviews were undertaken into the Census, including its regularity, after the 2011 Census was cancelled following the Christchurch earthquake. Whilst a five-yearly Census cycle has been maintained through to 2018, a Census Transformation programme has been established to investigate different and more cost effective ways of running the Census, including alternative ways of producing small-area population and socio-demographic statistics in the long term.

Statistics New Zealand's planning for their 2018 Census is well advanced and it will be adopting a very similar approach to the 2016 Australian Census, adapted to their local conditions. This will include a digital-first approach, the use of the postal service and an address register and a flexible field force using mobile devices.

New Zealand has an active program to transform its Census. In 2015 the New Zealand Government Cabinet considered and confirmed a paper entitled *Census-Transformation – A promising future*.² The paper recommended that "Statistics New Zealand be directed to actively work towards a future census based primarily on government's administrative data, supported by the redevelopment of its household surveys".

New Zealand has established an Integrated Data Infrastructure which combines Census data with other key national data sets in order to enable research that provides public benefit. New Zealand enables this infrastructure through the permanent retention of Census names and addresses. Further information on New Zealand's integrated data infrastructure is provided in Appendix 6.

United Kingdom

Censuses in the United Kingdom are conducted on a 10-yearly (decennial) basis. The UK Government initiated a review after the 2011 Census to determine whether the 2021 Census could be replaced by the use of administrative records. The review concluded, and was politically supported, that a full Census is required and should be conducted in 2021. Investment was also provided though to continue integration of administrative records with Census data in order to extend Census value and replace the traditional Census in the future.

The UK Census in 2021 will also adopt a number of common strategies to the 2016 Australian Census – including digital-first approaches and reminder letters – which will build on their mail out/mail back approach in Census 2011 and the establishment of a national address register for this Census.

The UK have also produced a longitudinal dataset by linking Census data from 1971, 1981, 1991 and 2001 with various other administrative datasets. The Longitudinal Dataset includes population data from England and Wales. Areas of research using the database include health and mortality, fertility,

² Statistics New Zealand, 'Census-Transformation – A promising future', October 2015, available: http://www.stats.govt.nz/about_us/what-we-do/our-publications/cabinet-papers/census-trans-promising-future.aspx).

ageing, family formation, ethnicity and religion, migration, educational and professional activity, social class.

Similar linkage projects have also been undertaken in Scotland and Northern Ireland.

United States

The United States conducts Censuses every ten years. The American decennial Census differs from the Australian Census in that it collects a very small number of data items (ten questions) to provide small area and national population counts. The United States relies on an ongoing survey called the American Community Survey, of 3 million households per year (1% population sample) to provide more detailed characteristics of the population and their housing.

The United States is actively considering alternative mechanisms to reduce the cost of the Census including the greater use of administrative records to supplement the data provided by households. US Census Bureau have released details of their 2020 Census design and it will include introducing an internet questionnaire for the first time, focus on self-response to minimise household visits and re-engineering field operations.

Since the 1940s, the US Census Bureau has routinely linked Census, survey and administration datasets, to create quality data about the American people and the country's economy. Government agencies and researchers commonly use the linked Census datasets to inform evidence-based policy making decisions.

For example, the data is used to model eligibility for and success of the Supplemental Nutrition Assistance Program (SNAP) which provides food to millions of eligible Americans. SNAP data is linked with the US Census Bureau's American Community Survey to gain insight into the characteristics and geographic distribution of the population that are eligible for, but not participating in, SNAP. Policies and programs can then be developed to specifically target assistance to these groups.

SECTION 8 – PLANNING AND PREPARATION OF THE 2016 CENSUS

8.1 Planning and Governance

The ABS undertook a significant transformation of the design and approach to the 2016 Census. A transformation was required. As explained in Section 6.4, the traditional Census model has an unsustainable need for an ever increasing size of temporary workforce and an ever increasing cost. As well, the traditional model has not adapted to a changing society and an increasing need for more statistical data. Supporting an increase in the number of households reporting online was an important component, but only a part of the end to end transformation required.

In August 2011, the Executive Leadership Group of the ABS agreed to a set of strategic directions for the 2016 Census of Population and Housing. These strategic directions proposed a new approach to the Census to address concerns with the traditional model. This new approach was supported by the Australian Statistical Advisory Council (ASAC) in November 2011.

Although the approach was new, it had similar aims to previous Censuses. The ABS had four goals for the 2016 Census. These were to:

- maximise the count of every dwelling and person in Australia
- maximise the value of the Census to all users
- protect the privacy of the public
- increase the efficiency and sustainability of the Census.

In 2012 a business case for the transformation of the 2016 Census was accepted by Government and reflected in the 2013-14 Federal Budget. This provided the required funding for the next four years to develop and conduct a transformed national Census. The ABS considers that it had adequate funding to conduct a high quality Census in 2016 and sufficient time to properly prepare for the Census.

Commencing in 2011, the ABS put into place an experienced and capable Census team to lead the development, testing and operations of the 2016 Census. All of the six Directors in the Census Program in 2012 had undertaken leadership roles in previous Censuses, with four of the six having experience in at least the past two Censuses.

The ABS also put in place strong governance processes around the 2016 Census. From 2012, the Census Program reported to an organisation-wide transformation steering committee¹, chaired by a Deputy Australian Statistician. In October 2015, as the Census drew closer, a dedicated Census Program Board was established, also chaired by a Deputy Australian Statistician. In both cases, the Deputy Australian Statistician chairs reported on Census progress to the ABS's Executive Leadership Group – chaired by the Australian Statistician.

The Census Program was divided into a number of projects, each of which provided monthly reporting and had relevant governance mechanisms. For example, the online Census had a dedicated Steering Committee which sat below the Program Board.

¹ The ABS 2017 Steering Committee

Governance mechanisms monitored and provided oversight on risks, issues, milestones and costs. Risk plans (including statistical risk plans) were developed at the Program level and for the online Census project².

Regular updates were provided to ASAC -- the most recent at its June 2016 meeting. Regular updates were also provided to Government, through the Minister responsible for the ABS.

A timeline showing the key milestones for the 2016 Census is provided at Table 8.1.

Table 8.1 - Key milestones for the 2016 Census

Date	Milestone
2011	
June	<ul style="list-style-type: none"> 2016 Census team established
August	<ul style="list-style-type: none"> ABS Senior Management Group endorses Strategic Directions for the 2016 Census
September	<ul style="list-style-type: none"> ABS Executive Leadership Group signs off Strategic Direction for the 2016 Census
November	<ul style="list-style-type: none"> Australian Statistical Advisory Council endorses Strategic Directions for the 2016 Census
2012	
July	<ul style="list-style-type: none"> Discussions commenced with Government on 2016 Census Business Case
August	<ul style="list-style-type: none"> ABS 2017 Steering Committee commences with responsibility for 2016 Census Census First Test - small scale test of 8000 dwellings - mail out model and mobile devices
November	<ul style="list-style-type: none"> Launch of public consultation on what topics should be included in the 2016 Census
2013	
May	<ul style="list-style-type: none"> Funding for Census transformation provided in Budget
August	<ul style="list-style-type: none"> Census Second test - test of 20,000 dwellings to determine casual staff impacts and digital operation management
2014	
April	<ul style="list-style-type: none"> International Peer Review
May	<ul style="list-style-type: none"> CapDA Report on procurement and technical solution for Census 2016
June	<ul style="list-style-type: none"> Memorandum of Understanding with Australia Post to support Census
July	<ul style="list-style-type: none"> Request For Tender (RFT) and Statement of Requirements (SOR) to IBM for the online Census solution
August	<ul style="list-style-type: none"> IBM Response to RFT Third Test - 100,000 dwellings - statistical impacts, system and processes readiness, public behaviour and address register
September	<ul style="list-style-type: none"> IBM tender determined as being value for money and contract signed
December	<ul style="list-style-type: none"> Discussions commence with the Australian Signals Directorate on online Census security
2015	
February	<ul style="list-style-type: none"> Address Canvassing exercise commences
May	<ul style="list-style-type: none"> Investment in Statistical Business Transformation Project announced by Government and affirmation of 2016 online Census
June	<ul style="list-style-type: none"> Announcement³ of Census topics – all current topics retained Direct engagement with key stakeholders conducted at the same time, and an email response sent to those that put in a topic submission

² The Senate Economic References Committee has separately been provided with these risk plans.

³ <http://www.abs.gov.au/websitedbs/D3310114.nsf/home/statement+on+2016+census+topics>

Date	Milestone
2015 (continued)	
August	<ul style="list-style-type: none"> • Fifth Test - 35,000 dwellings - self response test including contact materials and online form • 'Nature and Content'⁴ of the Census published which included a statement that retention of names is being considered • Government announces Census date as August 9 2016 and reaffirms a predominantly online Census
September	<ul style="list-style-type: none"> • Test of Discrete Community and Remote Areas procedures
October	<ul style="list-style-type: none"> • Census Program Board commenced, taking over from ABS 2017 Steering Committee • Census information sessions in each state, territory and selected regional centres conducted • ABS Executive Leadership Group considers proposal to retain names
November	<ul style="list-style-type: none"> • Memorandum of Understanding with the Australian Tax Office for the delivery of the Census Inquiry Service (CIS) • ABS publishes 'statement of intent' to conduct Privacy Impact Assessment (PIA) on proposal to retain names • PIA and consultation conducted on proposal to retain names and addresses
December	<ul style="list-style-type: none"> • Census 2016 risk review commences • ABS announces decision to retain names
2016	
January	<ul style="list-style-type: none"> • Data Capture Centre in Dandenong established
April	<ul style="list-style-type: none"> • ABS confirms names and addresses will be destroyed when there is no longer any community benefit to their retention or four years after collection, whichever is soonest
May	<ul style="list-style-type: none"> • Data Operations Centre in ABS House Belconnen established
June	<ul style="list-style-type: none"> • Census Program Board considers risk review • Pre Census Sentiment testing commences
July	<ul style="list-style-type: none"> • Online Census risk management plan finalised • Further pre-Census Sentiment testing • 25 July - CIS and Paper Form Request Service (PFRS) commence operations • 26 July - Online Census form opens • 26 July - Census processing begins
August	<ul style="list-style-type: none"> • 9 August - Census night • 17 August - Post Census Sentiment testing commenced
September	<ul style="list-style-type: none"> • 23 September – Public awareness that Online Census form closes • 25 September - Census Post Enumeration Survey commences • 30 September - CIS and PFRS close
2017	
April	<ul style="list-style-type: none"> • First results to be released

8.2 Design and Innovation

New approach

For the 2011 Census, the use of technology was orientated around digitising elements of the traditional approach, such as the prevailing Census form. The 2016 Census is the first Census that has been built 'digital first', where the business model is data orientated. The digital-first Census took greater advantage of existing information on dwellings and characteristics of different areas in order to apply heterogeneous approaches to maximise the effectiveness and efficiency of Census

⁴ Australian Bureau of Statistics, 'Census of Population and Housing: Nature and Content 2016', August 2015, cat no. 2008.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/2008.0>

operations. The new digital-first approach aims to provide a more effective, more efficient, more environmentally-friendly Census that was intended to be easier for people to complete.

The new approach:

- Changed the way Census materials were delivered and information is returned by the public. Australia Post's mail service was used to deliver and return required materials from the majority of households. The majority of households responded online. Households are able to request a paper form through an automated phone service if they preferred or needed to respond by paper. These changes were designed taking into account international best practices in Census taking and build on the Australian public's increasing access to and use of the internet, while also providing a paper response options for others
- Removed the need for Census Field Officers to visit every dwelling. The use of approach and reminder letters were planned to allow half of all Australians to respond to the Census before household visits were required. Household visits were planned to provide support to any households that required it, deliver additional materials and remind households to complete the Census.
- Allowed for approaches to be tailored to the needs of different areas. In some areas of Australia, where the postal service was likely to be unsuitable or insufficient address information was known, Census Field Officers delivered materials to each dwelling, enabling residents to either complete their form online or mail back a paper form. In other areas where a high proportion of residents were expected to need to complete the Census form on paper, all households were delivered paper forms in addition to login numbers (e.g. in areas where there is a higher proportion of older residents).
- Provided the ability to monitor progress on a near real-time basis through the integration of management information from Census Field Officers using handheld devices, call centre agents receiving public enquiries, completed online Census forms and completed paper Census forms when received by the secure Data Capture Centre. This information was be used to highlight areas of lower response, or any other issue, so that alternative strategies were enacted quickly to respond to these problems as they arose. In previous Censuses, such timely management information to inform operations was not available.

This new approach planned to deliver savings of \$100 million in the running of the 2016 Census compared to the 2011 Census. The digital-first Census will also establish a sustainable model for the Census 2021 and beyond.

A visual representation of the key facts and strategies involved in running the 2016 Census is provided in Figure 8.1.

Figure 8.1 - 2016 Census - Key facts and strategies



Key innovations for 2016

- **Address register:** Central to the new approach was the development of a national Address Register. The Address Register is Australia's most accurate and comprehensive national listing of addresses and the residential dwellings at each address. The register has enabled the use of mail outs, and flexible household level approaches and monitoring. The register has the potential for whole-of-government benefits, such as emergency preparedness.
- **Tailored approaches:** Small area data from the 2011 Census was analysed to tailor collection approaches to achieve the most effective and efficient outcome for each area and population group. For example, paper forms were delivered, as well as logon codes, to areas with low likelihood of internet response – e.g. areas where there is a high proportion of households where the youngest resident is over the age of 65.

- **Behavioural Economics:** In partnership with CSIRO, ABS developed and tested the Census instruction letter, reminder letter and their envelopes to best support the Australian public undertaking the required actions – completing the Census online or requesting a paper form. Forty-nine variants were tested through random control trials, in order to select the best approach letters to households and reminder letters where completed forms had not been submitted. Subsequent call activity by many households when they received their initial Census letter was not anticipated from this testing, and will need to be reviewed for the future.
- **Smart Online form:** An online form that provided a superior user experience across all platforms, devices and connection speeds, and delivered higher quality data through adapting questions to the respondent and targeted respondent prompts ('In the main job held last week, what type of nurse was [person name]?') was developed. The enhanced online form has significantly reduced the time taken by the average household to complete the Census. For example, in the first week, the average time taken to complete the Census online was 26 minutes compared to the 2011 benchmark for paper forms of 37mins.
- **Fully accessible online form:** The online form was designed and developed to enable people with disability to access and complete the form, including use of screen readers and other assistive technologies. The accessibility of the online form and Census web content was verified and certified independently.
- **Online, connected workforce:** A large casual workforce of 38,000 staff was recruited, trained and managed through online rather than paper-based processes. Optimised work and collection data in real time through a mobile app on "Bring Your Own Devices (BYOD) for all field staff. This is thought to be the largest BYOD deployment in Australia's history.
- **Responsive in real time:** Work was dynamically allocated to field staff in an optimised fashion, ensuring an even spread of work nationally. Progress was monitored at a household level and an adaptive approach was used in real time to ensure a more even response and thus higher quality Census data.
- **Deliver greater statistical value:** Better Census data will be delivered earlier and cheaper through digital collection. The value and responsiveness of ABS statistics is extended through high quality data integration using anonymous linkage keys within a secure ABS environment.

Together these innovations represent a citizen-centric, data-driven and technology enabled Census transformation. A visual representation is provided at Figure 8.2.

Figure 8.2 - Overview of key innovations for the 2016 Census



Privacy and Security

With protection of privacy as one of the 2016 Census goals, privacy and security were key considerations in Census design and preparations. In addition to standard ABS technology, workforce, process and policy protections, the 2016 Census provided a number of enhancements over previous Censuses, including:

- Delivery of compulsory online training to all Census casual staff – including a module on “Confidentiality and Security”
- Video welcome to the Census that emphasises the critical importance of security and confidentiality
- Conduct of national Police checks for all Census casual staff

- Delivery of envelopes with all Census paper forms so that forms are sealed in an envelope from when they are completed until returned to ABS secure environment. Direct return of materials through Australia Post rather than temporary storage at casual employees' homes
- Increased use of the online Census form which provides end to end encryption of Census data through to ABS secure environment.

8.3 Development and Preparations

Testing

An extensive test program, which was deliberative and iterative in nature, has underpinned the development of the 2016 Census:

- 2012 - small scale test of 8,000 dwellings in Canberra and surrounding areas was the first field test of the mail-out model and mobile devices. Separate focus groups, in-depth interviews and online surveys to understand mail-handling behaviours in Census mail out context.
- 2013 - larger test of 20,000 dwellings was conducted around Geelong. This test focussed on understanding casual staff impacts and digital operational management.
- 2014 - major test, of 100,000 dwellings in Adelaide, Albany and Perth was conducted. The test had a range of objectives, including: gaining evidence to assess any statistical impact from the planned changes; testing the readiness of processes, systems and infrastructure; understanding and measuring coverage quality of the Address Register and modelling likely public behaviour in 2016.
- 2015 - small test of 10,000 dwellings to shortlist most effective contact materials. Following this, a large test of 35,000 dwellings was conducted as part of a random control trial to identify the most effective design of household contact materials (letters) and to provide a distributed user test of the IBM hosted online Census application. Cognitive testing of use of the online and paper forms was conducted separately.

The ABS engaged external companies to undertake a range of testing of Census preparations, including:

- Revolution IT to undertake load and performance testing of both ABS developed and contracted ICT solutions;
- UXC Saltbush to undertake penetration testing and source code review of elements of both ABS developed and contracted ICT solutions; and
- Vision Australia to undertake accessibility testing of Census solutions for visually-impaired persons.

International Review

The development of the 2016 Census has been informed by the best practices in Census taking around the world through the ABS's engagement with a number of virtual working groups and bilateral discussions with a range of countries.

In April 2014, senior Census practitioners from the United Kingdom, Canada and New Zealand, along with previous ABS Census senior executives from the 2006 and 2011 Australian Census, undertook a

review of the ABS's plans and preparations for the 2016 Census. This review endorsed the new approach to the Census and provided feedback, such as to make more use of mail and adopt more tailored approaches, that helped to refine planning.

Engagement

The ABS undertook extensive engagement on the design and plans for Census 2016.

In November 2012, the ABS initiated public consultation around Census content and procedures by issuing a publication and media releases. The ABS highlighted key aspects of the Census transformation, as well as potential for changes to Census topics, and invited submissions. Between November 2012 and May 2013, the ABS conducted public information sessions in every state and territory with more than 200 external stakeholders attending the sessions, as well as bilateral discussions with key government users and community organisations. A public webinar was also broadcast with 150 organisations or individuals watching.

Over 1,000 submissions were received. In these submissions, 54 new topics were suggested and all 61 of the topics in the 2011 Census received strong support for retention. The ABS had more than 80 meetings with key external stakeholders including Australian Government departments, state/territory departments, statistical advisory groups and selected interest groups.

In June 2015, the ABS announced that the 2016 Census would contain the same topics as the 2011 Census. A subsequent publication⁵ in August 2015 noted that while there is an emerging need for new information, the addition of new topics to the Census would come with a considerable cost burden on households, and at the expense of other data collected. It also noted that the topics had been approved by the Australian Government, which is a requirement under the *Census and Statistics Act 1905*.

In addition to engagement on the nature and content of the Census, the Census program engaged with a number of government agencies, national peak bodies, community groups, businesses and associations to raise awareness of the Census, promote Census jobs and to obtain assistance to enumerate groups that might otherwise be missed.

In October 2015, the ABS conducted Information sessions in each state and territory capital city and some regional centres that provided an overview of Census 2016 plans and the proposed statistical products to be produced. More than 200 stakeholders attended these sessions, including representatives from state government departments, interest groups, local government and universities.

The ABS appointed Etcom, a multicultural marketing agency, to assist in the engagement with multicultural communities. This engagement included meetings with key groups, engaging and briefing cultural ambassadors, holding workshops and distributing social media tool kits.

In May 2016, the Census Program engaged with 22 non-government organisations in order to provide information on the 2016 Census approach and promote Census jobs.

⁵ Australian Bureau of Statistics, 'Census of Population and Housing: Nature and Content 2016', August 2015, cat no. 2008.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/2008.0>

In June and July 2016 the Census Program wrote to a range of non-government businesses and organisations, to obtain assistance to reach population groups in the Census that might otherwise be missed.

Engagement also included Australian Government Departments including the Department of Defence, Department of Health, Australian Federal Police, State Police Forces, Department of Immigration and Border Protection, Department of Human Services, Department of Social Services, Department of Foreign Affairs and Trade, National Disability Insurance Agency, Australian Electoral Commission, Australian Human Rights Commission, Office of the Australian Information Commissioner, Australian Sports Commission, Australian Signals Directorate, Australian Security Intelligence Organisation and Aboriginal Hostels Limited.

In June 2016 the ABS met with representatives from a small number of advocacy groups to discuss how people could report their sex as neither male nor female on the Census form.

In July 2016 the Australian Statistician wrote to the CEOs or Managing Directors of Australia's largest non-government employers to ask them to help raise awareness with their staff and with their customers or clients.

A Regional Management Unit was established in each state and territory and each has engaged extensively with state agencies, local governments and community organisations as part of the preparations for Census operations.

Please refer to Appendix 9 for additional details on Census 2016 engagement.

Communication Campaign

A communication campaign designed to drive participation is a key component of every Census. The campaign aims to ensure public awareness and understanding of the Census, in order to ensure an efficient, full and accurate count of the population. A challenge with Census communications is that the Census only occurs every 5 years and the level of understanding from previous Censuses is not high and 2016 had the added complexity of the changed Census process. Also new arrivals to Australia are unfamiliar with Australian Censuses and the communication campaign has to cater for this.

The 2016 Census campaign, like previous campaigns, had a strong focus on the Census reference night (9 August) in order to:

1. keep messages simple for a broad audience;
2. mobilise people around an 'event'; and
3. ensure that Census forms are completed in respect of Census night.

While the compulsory nature of the Census was part of the campaign, the ABS did not mention fines in any campaign materials before Census night.

The 2016 Census national campaign comprised integrated paid advertising, media and public relations, social media and online communication, stakeholder communication, special audience advertising and communication, and the development and distribution of information materials.

It was informed by a comprehensive range of ABS and Census developmental research, with the aim of raising awareness of when and how to participate in the Census among the general population, and eliciting a behavioural response – i.e. willing, self-response from the population to reduce the need for more expensive methods of face-to-face follow up. The campaign clearly communicated the 2016 mail-out and digital-first approach to the Census, and included strong calls to action to look out for Census mail and complete the Census online or request a paper form.

The campaign was developed and received approvals between July 2015 and March 2016 in accordance with the Government's review and governance arrangements for Government advertising campaigns. This included consideration and endorsement at all necessary stages of Service Delivery and Coordination Committee (SDCC) review, Independent Communication Committee (ICC) review, compliance with Commonwealth procurement policies and the requirements of the Guidelines on Information and Advertising Campaigns by non-corporate Commonwealth entities (the Guidelines), administered by the Department of Finance. The Department of Finance was engaged throughout, providing communications and process related advice.

Advertising across television, radio, print, digital and social media, and cinema was placed through the Government's Central Advertising System, administered by the Government's Master Media Agency, (Dentsu Mitchell). Advertising was also adapted and translated for Indigenous and Culturally and Linguistically Diverse (CALD) audiences.

The following external agencies were contracted to support the Census:

- BWM Dentsu – advertising agency
- Ecom – CALD communication agency
- Fenton Communication – public relations agency (state and territory media)
- Whereto Research – advertising creative concept testing
- DBM Consultants – campaign benchmark and tracking research for campaign evaluation
- iSentia – media and social media monitoring.

The ABS managed national media, including issues and crisis management, and social media. This included the broadcasting campaign and operational messages through Census social media channels, along with management of public commentary, enquiries and interaction via these channels and generated by campaign social advertising. The ABS used Sprout Social, a social media management platform that enables monitoring and management of all accounts (Facebook, Twitter and Instagram) from one platform, developed a range of standard responses to operational questions, and contracted additional support through a team of community managers provided by BWM Dentsu.

A full evaluation of the 2016 Census campaign will be conducted progressively and finalised in mid-2017 after quality indicators are available. It will include an evaluation of outcomes against the communication objectives, using benchmark and tracking research, media and social media monitoring and analysis, website and online form analytics, Census Inquiry Service trends and data, operational management information, and feedback from stakeholders and third party supporters. Overall participation rates in the Census, including self-response, online-response, and special audience response rates, will also inform evaluation of the campaign.

The ABS is obliged to notify the Committee that the following subsection "Online Census" contains Confidential Information under the terms of the contract with IBM (ABS2014.105 Services for eCensus and Data Capture Solution)

Online Census

In August 2012, the ABS began investigating the possibility of implementing a single online form solution which would provide web based surveys for the Census and all ABS surveys. This had the potential for broad public benefit. During 2012 and 2013 the ABS investigated the existing ABS survey software solution, Blaise, to assess its suitability for the 2016 Census. Blaise is a Statistics Netherlands product and the ABS's investigation of it as a solution was based on a preference for using internationally-accepted statistical infrastructure. In 2014, the Steering Committee responsible for the Census program took the decision that Blaise was not a viable solution.

The ABS engaged Capability Driven Acquisition (CapDA) to undertake an assessment of ABS capabilities and capacity and to conduct a detailed assessment of the ICT market to provide the ABS with an understanding of the capacity and availability of suitable companies to assist in delivering the online form. The CapDA assessment recommended that, in consideration of the limited time frame and the inherent risks in working with any new organisation, the ABS should consider a limited tender to IBM given their existing experience of the application and Census program. IBM had successfully provided the online Census applications in the 2006 and 2011 Censuses.

In July 2014 the ABS issued a Request for Tender (RFT) with a Statement of Requirements to IBM for the 2016 online Census solution. Among other things, the SOR specified that the application must be built to best practice to prevent attack and that the hosted environment must be protected from Distributed Denial of Services (DDoS) attacks.

In August 2014 IBM submitted tender documents. In its response, IBM identified a range of solutions, including completely hosting the online Census in the 'cloud' through to completely hosting the solution in a dedicated facility. IBM recommended, and the ABS subsequently accepted, a solution where Census data was protected using encryption on dedicated infrastructure hosted in Australia and that cloud services could be used for non-sensitive parts of the system (e.g. the public knowledge base). Apart from the requirement to store Census data on dedicated infrastructure, the ABS placed no restriction on IBM in the use of cloud-based services, as long as the use of these services was in line with Australian Government IT security requirements. The IBM response also outlined measures to ensure that it would be "highly resistant to web application security attacks", including DDoS attacks.

In September 2014 the IBM tender was determined as being value for money and later that month the ABS engaged IBM for the supply of the 2016 online Census.

The contract required that IBM develop, deliver, implement and host the online Census system in accordance with the SOR and its response to the RFT, including DDoS mitigation. The contract included specific service level agreement requirements for availability of the Census form overall,

with specific targets for Census night (98 percent of time during the peak four hour window) and fault resolution times on Census night (maximum 30 minutes).

The IBM contract required the delivery of a risk management plan for the online Census. This was delivered and accepted by the ABS. It included the denial of services as a risk that would be mitigated by IBM. This plan was updated over an 18 month period, including 9 risk workshops involving ABS and IBM staff. As part of the risk management planning process various discussions on security issues were held with the Australian Signals Directorate (ASD) commencing in December 2014.

In the final risk management plan (July 2016), one of the risks was “Loss of system availability through a Distributed Denial of Service Attack”. This risk had pre-mitigated exposure rating of ‘high’ and a residual exposure of ‘medium’. Under the plan, IBM was responsible for mitigating this risk, with ISP measures of Island Australia (geoblocking international traffic) a key measure.

During 2016 the ABS had sought and received various assurances from IBM about operational preparedness and resilience to DDoS attacks. In July 2016 the ABS arranged for a meeting with ASD and IBM to receive briefings from ASD on cyber threats and incident response support. The potential for DDoS attacks was discussed, as were general mitigations for a range of threats. ABS does not believe that any new areas of concern were raised, nor were there any suggestions of potential mitigations or additional preparations that were not pursued⁶.

Following ABS approval, on 5 August 2016 IBM undertook live testing of ‘Island Australia’ and informed the ABS that it had worked exactly as expected.

The ABS undertook a range of testing and independent assurance of the IBM developed and hosted online Census system, including:

- Engaging UXC Saltbush to undertake a code review and penetration testing;
- Engaging Revolution IT to undertake load and performance testing;
- Engaging Vision Australia to undertake accessibility testing;
- ASD reviewing the cryptographic architecture;
- Providing the proposed Solution Architecture to ASD for review;
- Compliance assessment of the IBM Baulkham Hills Data Centre against Protective Security Policy Framework Zone 4 requirements;
- Conducting a public test of the online Census across 35,000 randomly selected households; and
- Undertaking in-house ABS testing.

The ABS did not independently test the DDoS protections that IBM was contracted to put in place, as it considered that it had received reasonable assurances from IBM.

At no time was the ABS offered or advised of additional DDoS protections that could be put into place. Additionally, no suggestion was made to the ABS that the DDoS protections that were planned were inadequate.

⁶ However, at no stage did ASD provide assurances that the DDoS risk was effectively mitigated.

The Census Program engaged a recognised Australian and International Census expert to undertake a full Census Program Risk review. The Census Program Board considered the risk review at its June 2016 meeting. One of the program risks was “Security breach – online attack” (which included, but was not limited to, DDoS attack). For this risk, the inherent risk rating was ‘extreme’, the control effectiveness rating was ‘good’ and the residual risk rating was ‘moderate’.

The subsection containing Confidential Information under the terms of the contract with IBM (ABS2014.105 Services for eCensus and Data Capture Solution) concludes

Processing the Census

Traditionally, the ABS has established a large ‘offsite’ Processing Centre with the dual purpose of supporting paper handling and warehousing and processing Census forms, including coding of Census responses. However, with the new approach in 2016 with more online responses expected such a large centre was no longer needed. Instead, the ABS established a facility in Dandenong, Victoria for secure paper capture, which commenced operations in early 2016. Data operations, including coding and validation, are being undertaken in ABS House in Belconnen, ACT using existing ABS accommodation. The Data Operations Centre commenced its activities in May 2016.

Call Centre Operations

The Census Inquiry Service (CIS) is established each Census to provide telephone and email based support to the public on a 1300 number throughout the Census collection period. Census Inquiry Service agents provide support to the public, but do not collect or have access to any Census data.

In addition, a new telephony based service was introduced for the 2016 Census to automatically process requests for paper Census forms, known as the Paper Form Request System (PFRS). This service operated on a separate 1300 number.

In November 2015, consistent with the Government’s shared services policy, the ABS signed a Memorandum of Understanding with the Australia Taxation Office (ATO) to provide part of the call centre operation for the 2016 Census. The ATO had an existing panel of commercial outsourced providers supporting call centre operations and had significant experience in call centre management. It was considered the best value for money option available. In previous Censuses, the ABS has directly contracted a single commercial call centre provider to provide this service.

For the above-mentioned PFRS, Stratum was engaged through an open tender process to develop and operate the service, separate to the arrangement with ATO for the CIS.

Special Audience Strategies

The ABS uses a range of approaches for specific population groups to ensure the coverage of people in Australia is as complete as possible. These strategies are designed, in consultation and collaboration with the relevant communities and/or service providers, to ensure these groups participate in the Census and accurate information is collected.

Targeted approaches were developed to optimise accessibility and inclusion of the following groups:

- Remote Aboriginal and Torres Strait Islander peoples;
- Urban Aboriginal and Torres Strait Islander peoples;
- Defence personnel;
- people with disabilities;
- people experiencing homelessness;
- people from culturally and linguistically diverse backgrounds;
- people travelling or away from their home on Census Night;
- people living in mining camps and fly-in/fly-out workers; and
- older Australians.

Further information on special audience strategies is provided in Appendix 10.

SECTION 9 – OPERATIONAL ISSUES IN THE 2016 CENSUS

9.1 Call Centre Demand

The Census Inquiry Service (CIS) and the Paper Form Request System (PFRS) – described in Section 8.3 -- opened on 22 July 2016 and will remain operational until the end of September 2016.

Call volumes and patterns were forecast during the planning phase for the Census. Forecasts were based on a combination of 2011 Census call patterns and the call patterns from the annual field tests undertaken in the lead up to the 2016 Census. With the significant changes to the Census model for 2016, there was a higher degree of complexity in calculating predicted call volumes, patterns and average handling times. The total calls forecast for the 2016 Census was 1.6 million calls, compared with 1.04 million calls received for the 2011 Census.

In previous Censuses, the Census Inquiry Service had not been able to handle the peak volume of calls, and it was expected that this would also be likely in the 2016 Census. It was decided that the strategy for managing excess calls would be to politely request that callers call back later if the queues are at capacity, rather than provide callers with long wait times. This strategy is known as call blocking. Media strategies and operations were designed to try to spread calls in order to minimise peak periods.

Early on, both the PFRS and the CIS experienced demand that exceeded planned forecasts. ABS believes this was primarily caused by a number of factors. Unexpected and unprompted media and social media focus on potential of Census fines creating a degree of public fear (as noted previously, Census approach is to not mention fines before the Census night); faster than expected postage of approach letters; and the effectiveness of the Census advertising campaign in drawing the population's attention to the Census. Furthermore, with the unavailability of the online Census, on Census night, significant call numbers were received.

The consequence of this was, at times, high levels of call blocking on both systems. In response, the ABS took action to increase the capacity of both the CIS and PFRS as quickly as possible, and also issue public statements to reduce the fear around fines and encourage patience. The use of call blocking meant that 90.8% of callers that got through to the CIS had their calls answered within 5 minutes.

As at 8 September 2016, there had been 3.2 million call attempts to the CIS, compared to the 1.3 million calls that had been expected by this time. Of these calls, 1.1 million had been answered. In addition to the calls to the CIS, there had been 1.6 million calls to the automated inquiry service which enabled people to order a paper form, of which 0.9 million were handled automatically through the PFRS. The balance was part of the call attempts to the CIS.

The ABS also received a significantly greater number of electronic enquiries (submitted via an online enquiry form) than forecast. The number of online enquiries increased from approximately 50,000 in 2011 to 400,000 in 2016. Members of the public have had longer than expected wait times for email responses. The ABS responded by providing advice of the expected delays and an apology (via email), and significantly increased resources responding to emails.

The ABS has received a small number of complaints from members of the public regarding call costs for dialling the 1300 numbers, sometimes multiple times before they could get through. The ABS is currently investigating what options may be available for people who have been significantly adversely impacted by the call charges.

9.2 Online Census Outage

9 August 2016

During 9 August 2016 there were a range of overseas-based Distributed Denial of Service (DDoS) attacks on the online Census system hosted, under contract by IBM.

The first attack occurred at 10:10 am. At 10:16am the system became unavailable for the submission of forms. At 10:21am the attack stopped. The attack was inferred as being from overseas. After this attack, the ABS and IBM held discussions about the appropriate response to further attacks, including invoking 'Island Australia'.

During the second attack (at 11:45 am) the system became unavailable for two minutes. 'Island Australia' was switched on and the attack stopped shortly after. 'Island Australia' remained enabled, and the ABS was of the understanding that the online form would now be protected from any further attacks. ABS reported the attacks to ASD.

4:52pm -- a third DDoS attack occurred, which was handled in line with expectations with no disruption to service.

7:28pm -- a fourth, once again inferred as being overseas-based, DDoS attack occurred and by 7:33pm the online Census system was unavailable to the Australian public. The nature of the attack was different from the three previous attacks and the online Census system degraded faster.¹

By this time approximately 2.2 million Australian households had successfully completed the online Census and these forms were safely stored. The submission rates were in line with expectations, well within load capacity, and did not cause the failure of the system (see Figure 9.1).

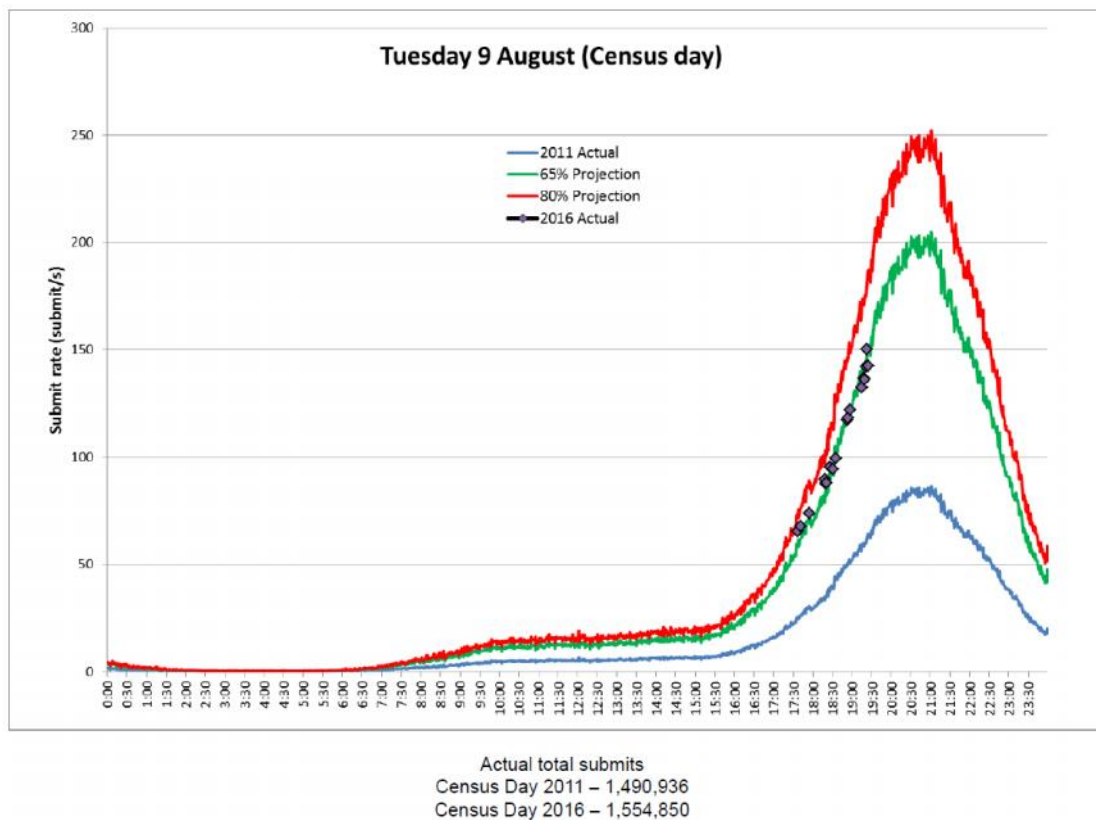
As a result of the DDoS attack, the ABS understands that IBM began to experience problems with its border routers. IBM first attempted to reboot its system at 7:43pm, but this was not successful.

At the time of the DDoS attack, the ABS and IBM observed (on a shared real-time dashboard) an unusual spike in outbound traffic in the IBM monitoring systems. The spike was unexplained, which prompted concerns that the system may have been compromised. The ABS and IBM put priority into identifying the cause.

7:56pm -- the ABS contacted ASD. Throughout the night, the ABS engaged with ASD.

¹ In addition to DNS reflection traffic, the online Census web services began experiencing resource exhaustion issues as all available HTTP worker threads were occupied.

Figure 9.1 - Actual and projected load capacities, Tuesday 9 August 2016



8:09pm -- the ABS requested that IBM enable 'overload' control which prevented the Australian public from commencing new Census forms to ensure that Census data was protected. The ABS General Manager Census and Statistical Network Services Division made this decision.

8:26pm -- the Australian Statistician provided an initial telephone briefing to the Hon Michael McCormack MP, the Minister for Small Business who has Ministerial oversight for the ABS. The Australian Statistician provided updates to the Minister during the evening.

8:38pm-- the ABS published a message through social media channels informing people that the Census website was experiencing an outage and we were working to restore service on the website.

8:50pm – the ABS requested Dentsu Mitchell turn off all social and digital advertising immediately.

9:15 pm -- the ABS decided to keep the online Census system closed until the ABS was confident that:

- (1) the outbound traffic was understood and confirmed with ASD;
- (2) it was understood why geoblocking failed to prevent the DDoS attack so that protections against any new DDoS attacks would be effective; and
- (3) that the infrastructure was robust, including routers which had experienced issues.

The Australian Statistician, in consultation with the ABS Senior Executive present, made this decision.

9:20pm -- Dentsu Mitchell confirmed all digital Census search advertising had been turned off. Dentsu Mitchell advised that digital advertising would be turned off in 20 minutes and that Twitter was still attempting to turn off the automatic retweet subscription reminder to complete Census form tweets.

10:26pm -- the ABS understands that IBM was able to successfully reboot the online Census system. However, the system remained closed to the Australian public pending resolution of the three issues identified above.

10:59pm -- the ABS posted updates to social media that the site would not be available tonight and that an update would be provided in the morning. ABS also posted a message reminding the public that there are no fines for completing the Census after August 9.

10 August 2016

2:00am – The ABS and IBM conclusively determined that both the outage was caused by an overseas-based DDoS attack and no data was lost. ASD provided advice and agreed that IBM’s investigation methodology and reasoning for its conclusions was sound. Meanwhile efforts continued to address the other two concerns – the failure of geoblocking and the effectiveness of protections against further DDoS attacks; and the robustness of the system. Investigations subsequently identified that IBM failed to properly implement geoblocking.

8:00am – The Australian Statistician participated in a telephone hook-up to discuss the events that included, among others, the Prime Minister, the Treasurer and the Minister for Small Business.

The Australian Statistician, through ABC News Radio, ABC Radio National and a Media Conference (with Minister McCormack and Mr Alastair MacGibbon, Special Adviser to the Prime Minister on Cyber Security) communicated to the public that it was a denial of service attack that disrupted the site, that Census data is safe, that the ABS apologises for the inconvenience and that the site will be re-opened as soon as possible.

The ABS published regular updates to the ABS website and through social media channels throughout August. The ABS also published a statement on 10 August to explain what had occurred on 9 August.

The Australian Privacy Commissioner commenced an investigation into the incident on the Census night, with the priority in doing so to ensure that no personal information had been compromised.

11 August

The Privacy Commissioner announced:

“ASD advised me that the incident was a denial of service (DoS) attack and did not result in any unauthorised access to, or extraction of, any personal information and, on the information provided

to me by ASD, I am satisfied that personal information was not inappropriately accessed, lost or mishandled.

The ABS's decision to shut down the website — to avoid any prospect that the DoS attack could include or otherwise facilitate a data breach — was, in the circumstances, a pro-privacy precaution”²

At 1:16pm on 11 August, the ABS received advice from ASD that ASD was of the view that IBM had taken all steps that could reasonably be taken in the time available to mitigate denial of service attacks similar to those that occurred on 9 August. At 1:35pm the Australian Statistician briefed the Minister on the ASD advice and advised that the online Census system would be reactivated. At 2:29pm the system was re-opened to the Australian public.

The ABS issued a press release and held a media conference to confirm that the site had been re-opened, that Census data was safe and that the Census was continuing. The ABS commenced business as usual media engagement and re-commenced updated advertising as soon as possible.

Since the re-opening of the online Census, a further 2.6 million households (as at 21 September 2016) have completed an online Census form.

² <https://www.oaic.gov.au/media-and-speeches/statements/census-2016-website-incident-august-9>

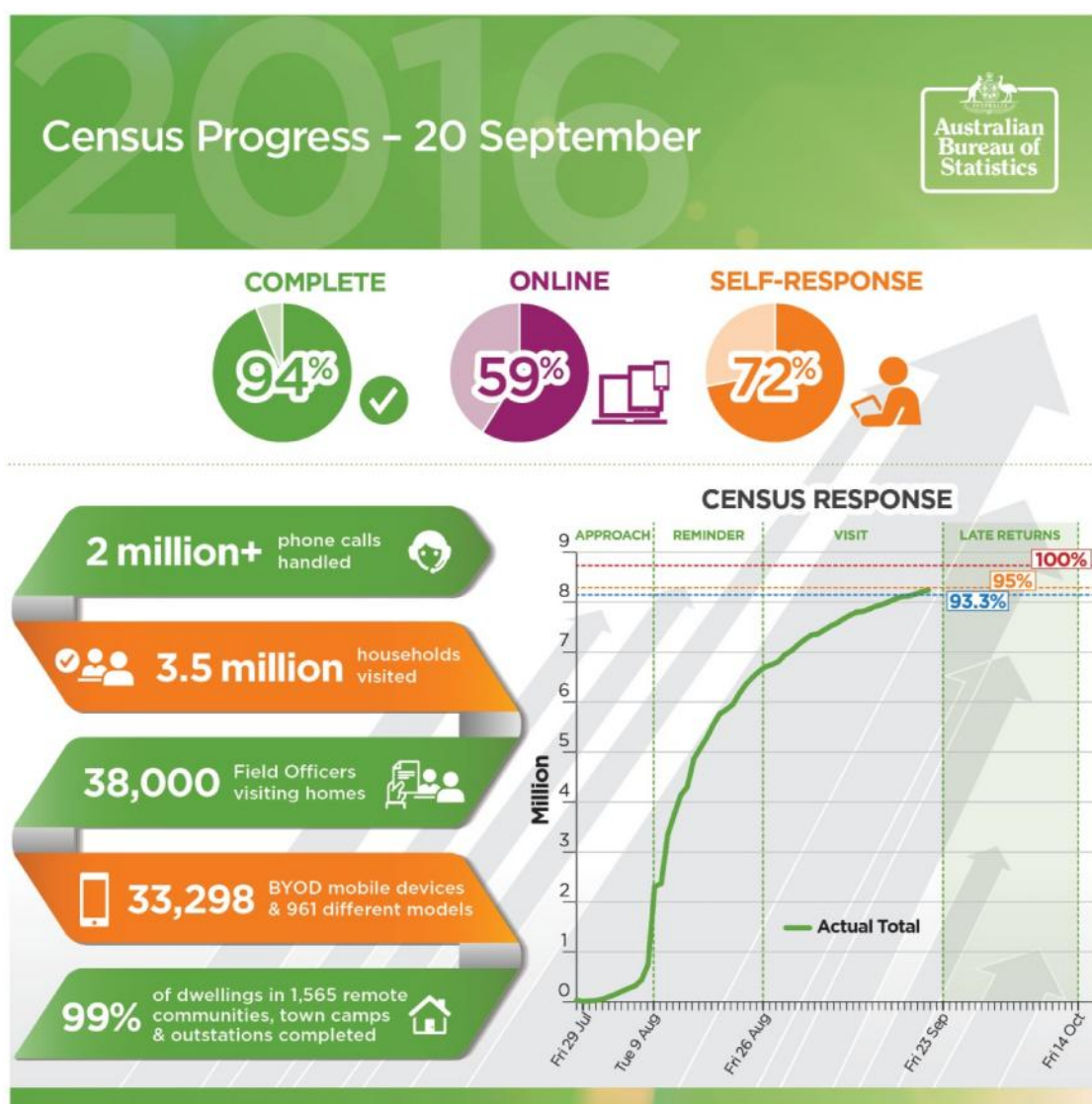
SECTION 10 - CENSUS OUTCOME

The critical outcome of the Census is a high-quality data set that can be used to directly support decision making, and that can form the basis for accurate population estimates.

An overview of progress in relation to the 2016 Census is provided at Figure 10.1.

The management of imperfections or statistical error is an integral part of the design and conduct of the Census. The 2016 Census was developed with a number of enhancements in order to better manage statistical error.

Figure 10.1 - Census Progress, 20 September 2016



10.1 Management of statistical risk

Commencing in July 2015, the ABS undertook a comprehensive statistical risk review for the 2016 Census. The review, reporting to the Census Program Board, identified the key statistical risks associated with the 2016 Census model. The review ensured that the Census Program had clarified, articulated and understood key data risks associated with the 2016 Census model, so that these could be managed, measured and mitigated against.

The statistical risk review, and the developed risk mitigation plans, have assisted in the ABS's response to the operational issues experienced during the Census. In particular, the ability for the ABS to monitor progress in real time, communicate electronically to staff and adjust plans has allowed potential issues to be resolved.

10.2 Community sentiment

In June 2016, the ABS undertook research to determine Australians' intention to participate in the Census, particularly online, and establish how they felt about completing the Census at that time.

Results of this research showed that 73% of Australians felt positive towards the Census. At that time, only 7% of people said they had concerns about completing the Census; these were most commonly a reluctance to share personal information or a worry about how the data is stored. A very low proportion, only 3% of the 7% with concerns (approximately 0.2% of all Australians), were worried about the length of time data would be stored.

Further, and in line with Government advertising process requirements, the ABS commissioned independent Census campaign evaluation research, prior to and after Census night.

The benchmark component of this research, conducted prior to the 2016 Census advertising campaign in July 2016, showed that 78% of people were aware of the Census. Of these people, support for the Census was strong, with 95% 'for' the Census. Almost all respondents aware of the Census (97%) claimed they or someone else in the household would complete the 2016 Census, similar to levels seen in 2011 (95%).

A continuous wave of this research ran from the end of July to Census night (9 August). A post Census night wave was conducted during the period 17 August – 4 September (Post Wave 1) and a further wave (Post Wave 2) was conducted at the completion of the advertising period (5-9 September inclusive).

Post Wave 1 results showed that awareness of the Census had increased to 96% and the majority of those who were aware of the Census also thought that information provided in the Census should be as accurate as possible (98%). At that time, less than 1% of those aware of the Census indicated that they were not planning to complete the Census.

While 88% of respondents stated that they had heard or seen negative publicity about the Census, a large majority of these (83%) had not changed their behaviour as a result. Of those who had changed behaviours, delaying completion or completing the paper form instead of the online form accounted for most mentions. Only 1% of those who had heard or seen negative Census publicity said they did not provide their name or address as a result of that publicity.

Overall, and consistently throughout the testing period, the proportion of Australians with concerns about the Census were relatively low and were comparable with the results from the 2011 Census. The proportion of respondents aware of the Census and who also agreed to some extent with the statement *'The Census is an invasion of people's privacy'* was 15.5% in 2011 and 14.3% in 2016 (Post Wave 2). The proportion of respondents who were 'against' the Census was also similar in 2011 and 2016 at 4.9% and 4.1% respectively. Based on earlier Census experience, this suggests that many people who state they are 'against' the Census or who believe the Census is an invasion of privacy may still complete the Census.

In 2016, it was possible to 'drill down' into the reasons why someone responded that they were 'against' the Census. Of the 4.1% of those surveyed who reported being 'against' the Census, 28% (or 1.1% of all surveyed) cited privacy concerns, 16% (approx. 0.6% of all Surveyed) cited concerns about the personal or invasive nature of the questions, 8% (approx. 0.3% of all Surveyed) cited concerns with linkages to other government data, 6.1% (approx. 0.2% of all Surveyed) cited concerns with retaining personal information and 5.7% (approx. 0.2% of all Surveyed) cited general concerns around confidentiality. Other reasons for being 'against' the Census were not related to privacy.

On 26 August 2016 Roy Morgan Research¹ released results from their independent special snap SMS Morgan Poll conducted on the 24 and 25 August 2016. It found that 85% of Australian households had completed their Census form, which was slightly higher than the measured ABS response rates at that time. The CEO of Roy Morgan Research stated *"An overwhelming majority of Australian households (85%) have completed the 2016 Census despite significant problems with the Census website on the designated Census night – Tuesday August 9, 2016"*.

10.3 Census responses

This strong community support is shown in the Census response rates.

As at 20 September 2016, the ABS had received forms for 94.4% of households². Of the responses, 59% have been submitted online with the remainder on paper. While each Census has a particular reference date – 9 August in the case of the 2016 Census – Censuses are collected over a period of months. Of the completed forms 72% were obtained without any visit to the household's home in the reminder phase. More than 7 million households had responded to the Census by the end of August 2016. The ABS expects to still be receiving a considerable number of completed Census paper returns in late September and early October through the postal system. Although the ABS approached about 10 million dwellings, Census responses are only expected from occupied dwellings, and in 2011 more than 10% of dwellings were unoccupied on Census night. The ABS will provide an updated preliminary participation rate to the Inquiry Hearings in October 2016.

A final measure of Census response rates will not be available until early 2017 after Census processing. However, the participation rate is the best proxy for the dwelling response rate until the dwelling response rate can be calculated. The ABS expects that the final participation rate will be above 95%. It should be noted that preliminary figures are based on a range of assumptions and

¹ <http://www.roymorgan.com/findings/6949-australian-census-completion-hits-85-august-26-2016-201608261621>

² This preliminary participation rate is calculated by dividing the number of completed household forms received into the estimated number of dwellings. See Appendix 7 for a discussion of Census response rates.

subject to error that cannot be corrected until household forms are validated at an individual level. This process takes a number of months.

The number of persons refusing to complete the Census form is low. At 20 September 2016, there had been 6,743 refusals. This compares with 13,194 refusals in 2011.

The Census is currently in the visit phase, with 38,000 field workers visiting households yet to complete the Census across Australia to remind them to complete their Census form, either online or on paper. This phase is due to be completed by 23 September. The management of this stage has improved considerably from past Censuses, with visits being informed by sophisticated, 'real time' management information that optimises the allocation of workloads and, importantly, seeks to ensure an even pattern of response across Australia. The field workers are equipped with mobile technology to assist them in their work and to ensure that 'intelligence' from the field process is captured and conveyed quickly to the ABS.

A key component of a high quality Census is obtaining sufficient rates of response. (For a discussion of key measures of statistical quality, see Appendix 7.) The 2006 Census had a 95.8% response rate for dwellings and the 2011 Census a 96.5% response rate for dwellings

A quality measure of the 2016 Census of Population and Housing is not just the overall response rate, but also the number of areas with response rates below a sufficient level. In the 2011 Census, whilst the national response rate was 96.5%, there were 9% of small areas that had a response rate below 93.5%. The follow up in 2016 concentrates on areas of lowest response to lift the response rate above 93.5%.

The ABS provides households with every opportunity to complete their Census form. This includes using an approach letter, reminder letter, household visits with hand-delivery of Census forms and online Census login codes, multiple reminder visits and a final response letter. If a response is still not forthcoming a legal 'notice of direction' to complete the form can be issued. If a person refuses to comply with this direction, the ABS considers whether the person should be referred for prosecution by the Director of Public Prosecutions, taking into account the person's circumstances. The ABS expects that, in line with previous Censuses, referrals for prosecution will be used sparingly.

As mentioned in section 8.3, special enumeration strategies are adopted to ensure quality response rates for particular population groups, such as homeless, Aboriginal and Torres Strait Islanders, culturally and linguistically diverse and hospitals and care facilities. These strategies have been largely, if not completely, unaffected by the online Census outage. They are proceeding in line with expectations or, in some cases (e.g. remote Aboriginal and Torres Strait Islander peoples), ahead of expectations.

The quality of Census results is also determined by the quality of responses to the questions on the Census form. In this regard, it is important to note that in the 2011 Census the quality of data from online forms was better than paper forms. The much higher take-up of online forms in 2016 should lead to overall quality improvements. While it is too early to be definitive about the quality of

responses, initial work has indicated that the quality of responses to the 'name' question is high with an estimated³ 1.2% non-response rate⁴. (Comparable figures are not available for the 2011 Census.)

For other questions, the estimated non-response rates for the 2016 Census (with the non-response rates for the 2011 Census shown in parentheses) are: Age 0.4% (0.5%), Country of Birth⁵ 2.6% (2.1%), Indigenous Status 0.8% (1.5%), Australian Citizenship 1.6% (2.3%), Income 3.2% (4.2%), Student Status 1.7% (2.8%) and Religion⁶ 4.0% (5.0%). For six of the seven questions, the estimated non-response rates for 2016 are lower than that achieved in 2011. As these are early estimates, it is not possible to be certain of these outcomes; however the ABS is reasonably confident that the non-response rates to the 2016 Census should be at least comparable to those in 2011

Inevitably in Censuses some people are not counted and some people are counted more than once. In Australia, a Post Enumeration Survey (PES) is conducted after each Census. The PES is an independent household survey to provide an independent measure of the completeness of Census counts and it is used to compile estimates of the population estimates from Census results. Throughout the developed world a PES (often referred to as a "coverage survey") is an accepted, best practice component of measuring populations.

The 2016 PES will cover 50,000 dwellings and be conducted in late September and through October 2016. If the Census response rate is at least 93.3%, then the PES adjustment will have an acceptable Margin of Error. (This Census response rate has already been achieved.) The PES provides an estimate of undercounts by age, location, Indigenous status, sex and country of birth. Estimating net undercount is important for producing an accurate estimate of Australia's population (by adjusting for people missed in the Census). The PES results will be published by mid-2017.

As for previous Censuses, quality assurance processes are a key feature of 2016 Census processing to ensure that processing errors are kept to an acceptable level and that the quality of outputs is high. Sample checking is undertaken during processing and coding operations and corrections are made where necessary.

The final data are put through a series of checks to ensure internal consistency. The data are also assessed for changes over time, by comparing them with the previous Census, compared with other data sources (eg the Labour Force survey, for employment and occupation items) for coherence, and across topic categories where expected relationships can be confirmed and unexpected relationships investigated.

All topics in the Census have a level of non-response, although this is generally low. Non-response in the 2016 Census will be compared against the 2011 Census. Non-response for key demographic items are imputed using other information on the Census form, as well as information from the previous Census, as these items are needed to calculate population estimates.

³ The estimated non-response rates for certain Census questions have been calculated from online forms currently received and a sample of paper forms currently received, with the estimate assuming that 60% of forms will be received online and 40% will be received on paper.

⁴ Forms that do not have a valid name are still usable in the Census if they contain valid responses to other questions.

⁵ The 2011 Census included responses derived from other information on the Census form. This process has not yet taken place for the 2016 Census.

⁶ Voluntary question.

10.4 Transparency and outputs

As with previous Censuses, the ABS will be transparent about the quality of every Census topic and every Census output. This will include publishing key quality indicators such as coverage and response rates, and detailed information on the quality of each data item including imputation rates. It is usual ABS practice to publish this information after Census results have been released.

Given some level of public concern that recent events may have an adverse effect on the quality of Census results, the ABS is proposing to assemble an independent panel to provide extra assurance and transparency of Census quality. The initial focus of the panel will be to review the quality approaches developed by the ABS for the Census and PES.

At a later date the panel will examine metrics from the Census on quality aspects, examine metrics from the PES and review over and undercount analysis. The panel will provide its own independent assessment of the quality of the 2016 Census, which will be published.

The ABS will also work proactively with key users and the public more broadly to ensure that there is a sound understanding of the quality of the Census results.

The first release of 2016 Census data will be on 11 April 2017. The digital-first approach to the 2016 Census will enable data to be available 2.5 months earlier than for any previous Census.

SECTION 11 – THE 2016 CENSUS AND DATA INTEGRATION

11.1 The history of the Census and data integration

The 5-yearly Census of Population and Housing is an unparalleled source of information about Australian people and households, including family structures, education and qualifications, work (including hours worked, occupation and industry), ethnicity, income, and housing. It represents a substantial investment by the Australian community, both in the cost of the collection and in the time taken for members of the community to provide their personal information.

As outlined in Section 7, national statistical offices are increasingly undertaking greater integration of Census data with survey data and with administrative datasets. The drivers are different depending on the institutional context but the common element is the increasing costs and respondent burden on the public of traditional survey approaches to meeting current and emerging information needs. The ABS has been studying these international developments for at least the past two decades.

In Australia, the ABS commenced an extensive consultation process in 2005, marking the commencement of the ABS's Census Data Enhancement program. The key driver for this initiative was the opportunity to increase the statistical value from the 5-yearly Census program, and to better meet stakeholder demands, by reusing existing data to support policy development and research.

The ABS proposal at that time was to enhance the value of data from the 2006 Census by combining it with future Censuses to create a 'longitudinal' view, in conjunction with other nationally important datasets. The proposal was in response to the demand for better evidence on the circumstances that influence particular outcomes for people or local communities across the life course and over time.

The Australian proposal was akin to the successful establishment of enhanced Census datasets in the US, UK and New Zealand e.g. For example, the UK's *ONS Longitudinal Study*¹ is a complete set of census records for a sample of individuals linked between successive censuses (commencing with the 1971 Census), together with data for various health events.

Following consideration of the feedback from the extensive consultation process and the outcomes of an Independent Privacy Impact Assessment, the ABS Census Data Enhancement program was launched by the then Australian Statistician, Mr Dennis Trewin, for the 2006 Census. The program was subsequently expanded under the next Australian Statistician, Mr Brian Pink, for the 2011 Census and by the current Australian Statistician, Mr David Kalisch, for the 2016 Census.

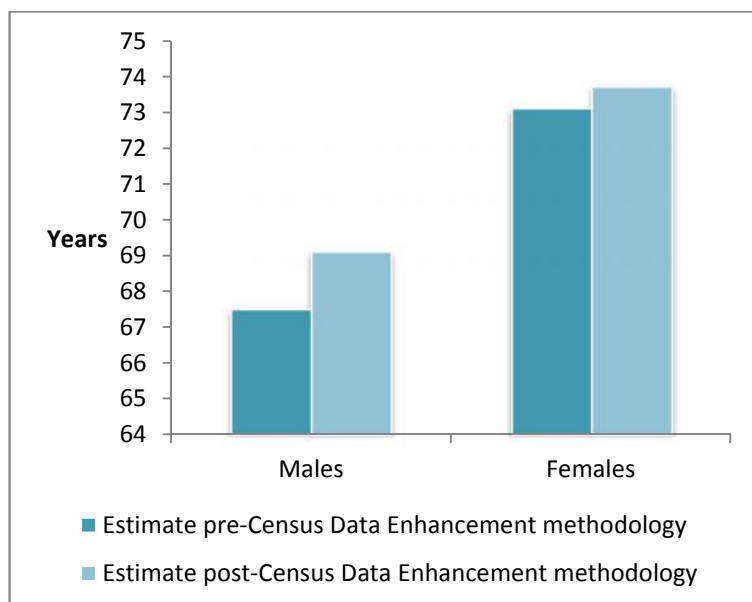
2006 Census Data Enhancement program

A significant achievement of the 2006 Census Data Enhancement program was the establishment of enhanced measures to assess progress against closing the life expectancy gap between Aboriginal and Torres Strait Islander peoples and other Australians. These measures are produced from linked Census data and death records using name and address. Figure 11.1 shows estimates of Indigenous life expectancy at birth for men and women for the years 2005-07 and 2010-12. Using the 2012

¹ <http://celsius.lshtm.ac.uk/what.html>

Census Data Enhancement method of estimation, life expectancy for Aboriginal and Torres Strait Islander men increased from 67.5 years in 2005-07 to 69.1 years in 2010-12, and for women from 73.1 years in 2005-07 to 73.7 years in 2010-12.

Figure 11.1 - Enhanced measures of Aboriginal and Torres Strait Islander life expectancy, 2005 to 2007²



Recognising the importance of these enhanced life expectancy measures to the Council of Australian Governments, the ABS received ongoing funding from Government in 2009 to continue this work each Census, and this assisted the ABS to build the capability and expertise to undertake data integration safely, whilst preserving privacy (refer also to Section 4.3).

The 2006 Census Data Enhancement program confirmed the feasibility of developing a 5% statistical longitudinal Census Dataset, which is now known as the Australian Census Longitudinal Dataset (ACL D). The quality study³ also recommended the ABS make use of a non-identifying grouped numeric code based on name to improve the accuracy of the linked dataset as well as improve the efficiency of the linking process.

By 2009, the ABS had undertaken a number of quality and feasibility studies to build expertise in statistical methodology and the practice of data linking for data sources that did not contain a unique identifier such as ABN which is commonly used in the linking of business data. This work

² Australian Bureau of Statistics, 2010-12, *Life Tables for Aboriginal and Torres Strait Islander Australians*, cat. No. 3302.0.55.03, available: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3302.0.55.003>

³ Australian Bureau of Statistics, 2009, *Research Paper: Assessing the Likely Quality of the Statistical Longitudinal Census Dataset, August 2009*, cat. No. 1351.0.55.026, available: <http://abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyCatalogue/C5E5828D49ED77C5CA2576160015F73C?OpenDocument>

included the development of gold, silver and bronze⁴ approaches to data linking and included building an understanding of accuracy issues to develop measures that support analysis.

Quality studies undertaken using names and addresses from the 2006 Census also delivered a breakthrough in testing the feasibility of replacing manual matching processes with automated data linking in the Census Post Enumeration Survey. The study found that important quality and efficiency gains could be made from automated data linking particularly in relation to locating respondents at undisclosed or poorly reported Census night addresses.

2011 Census Data Enhancement program

Leveraging advances in governance arrangements and methodological capability, described in Section 4.3, the Census Data Enhancement program was expanded for the 2011 Census and provided an improved and enhanced range of statistics in important areas of public policy and community interest such as education, migration, and health as well as informing on the impacts of Australia's changing economic and social environment.

The ABS announced its intentions for 2011 in '*Census Data Enhancement: An Update 2011*⁵', published in October 2010. For the first time, automated data linking to the Census was implemented in the 2011 Post Enumeration Survey delivering significant efficiencies compared to previous manual approaches and better quality measures of Census under and overcounts in order to produce more accurate statistics on Australia's population.

Consistent with the quality studies undertaken as part of the 2006 Census Data Enhancement program mentioned previously, a non-identifying grouped numeric code was assigned to all records in the ACLD following the 2011 Census using a combination of letters from first and last names using a secure one-way process. For example, "Joe Blake" might become "100321". Each code represents approximately 2000 people and therefore is not unique to an individual. Since a large number of different names receive the same hash value, it cannot be reversed to identify individuals. However, a particular name and surname will always code to the same hash value so that it is a useful linking variable.

The code is only accessible to those ABS staff creating the linked dataset, and will not be released outside the ABS. For the 2016 wave, the ABS will make use of this non-identifying grouped numeric code based on name to improve the accuracy of the linked dataset as well as improve the efficiency of the linking process. This code may also be used to improve accuracy in the linking of other datasets to the ACLD.

In 2013, the flagship ACLD, which safely brings together a 5% sample of 2006 and 2011 Census records, was released in ABS TableBuilder. The ACLD is heavily used by over 8,000 approved

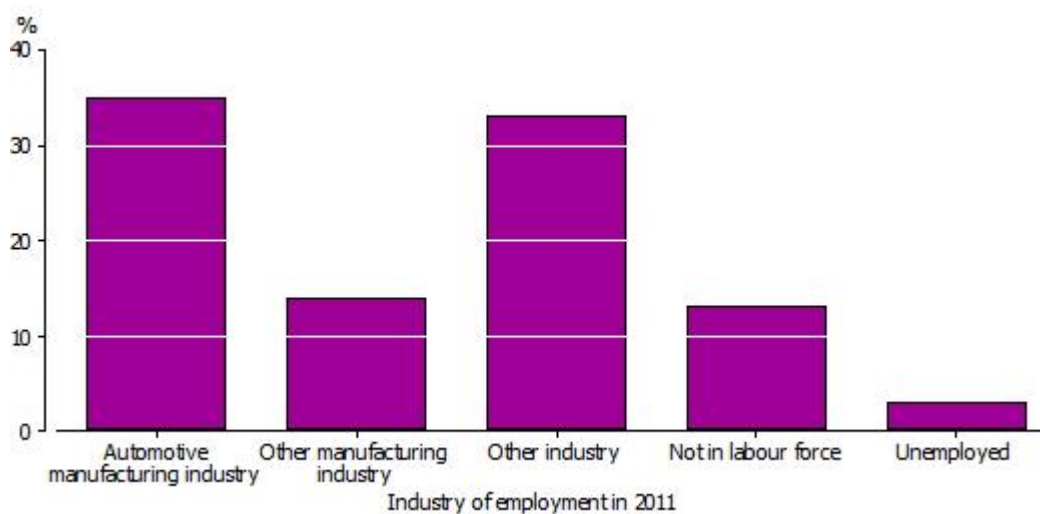
⁴ Gold Standard Linkage refers to the use of reported name and address information along with other demographic characteristics such as age, sex, date of birth and marital status. Silver standard linkage uses only an encrypted form of name and geocoded address together with other demographic characteristics. Lastly, Bronze standard linkage does not use any form of name, reported or anonymised, but it may use geocoded address in addition to demographic characteristics.

⁵ Australian Bureau of Statistics, *Census Data Enhancement project: An update, 2011*, November 2014, cat no. 2062.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/2062.0>

researchers across government, academia and other non-government organisations for uncovering new insights into the dynamics and transitions that drive social and economic change over time.

For example, the Australian Government Department of Industry used the ACLD to look at the impact of car manufacturing closures in Victoria and South Australia. The large sample size of the dataset enabled analyses by location and on the diverse outcomes of retrenched workers that would not be possible from the usual ABS household survey approaches. Figure 11.2 shows that for workers who were in the automotive manufacturing industry in 2006, 35% still worked in the automotive manufacturing industry in 2011, while a third were employed in other industries and 16% were not in the labour force.

Figure - 11.2 2011 Outcomes for retrenched automotive manufacturing industry workers⁵



Soon after the release of the ACLD, the ABS, in partnership with the Department of Immigration and Border Protection, released the Australian Census and Migrants Integrated Dataset in early 2014 which brought together immigration settlements data with the 2011 Census data. For the first time, policy analysts were able to gain new insights into how different categories of migrants fared over time, particularly in relation to English proficiency, education and employment. The policy relevance of this data development was published in the Australian Economic Review in June 2014.⁶

Similarly, the Mental Health Services and Census data project addressed a critical gap in mental health-related research data in Australia. This data is being used in the development and evaluation of mental health programs and support services now and into the future. Analysis of the dataset has helped 'join the dots' between mental health related services, medication use and socioeconomic information which was enormously helpful in informing the National Mental Health Commission's *2014 National Review of Mental Health Programs*.

Also during 2014, a range of new insights were gained from a number of education data integration studies undertaken in partnership with the Australian Government, Tasmanian and Queensland education portfolios as well as the National Centre for Vocational Education Research. These studies

⁶ Smith, D & Smith, T, 'Using Linking to Sharpen Policy-Thinking: Early findings from the Australian Census and Migrants Integrated Dataset,' June 2014, *Australian Economic Review*, Vol. 47, No. 2.

provided insights into the educational outcomes of students from across various stages of the lifecycle including: early childhood development and the effect of preschool attendance; the role of parental and other socioeconomic characteristics on student achievement; and the effect of in-school vocational training on the employment and educational outcomes of young people.

Despite the achievements from data integration projects involving the 2011 Census data, the scale of activity and the outcomes could be described as relatively modest in comparison to the opportunity and the benefits that could be realised. This partly reflects the reduction in value of the Census data for these purposes resulting from the practice of destroying names at the end of Census data processing, about 18 months after Census night.

A summary of all 2011 Census Data Enhancement projects is provided in Appendix 11.

11.2 The changes proposed for the 2016 Census Data Enhancement Program

Following the 2006 and 2011 Censuses, a number of data quality studies were conducted to evaluate the quality of data linkage involving name and address compared with data linkage that didn't involve name and address. This showed that use of name and address led to higher quality linkage and therefore higher quality statistics.

A small number of data integration projects require extremely high quality linkage and can only be undertaken during Census processing when Census form images are still available for clerical matching and searching. Consistent with the 2011 Census, there will be two such projects for the 2016 Census: the 2016 Census Post Enumeration Survey and the Aboriginal and Torres Strait Islander Mortality study.

In addition to these projects, planning is well advanced for the compilation and dissemination of a third wave to the Australian Longitudinal Census Dataset and a 2016 Australian Census and Migrants Integrated Dataset.

In addition, the ABS is striving to extract significantly more statistical value through safe and more effective use of the 2016 Census data. In particular, there are strong demands on the ABS to deliver much better statistical information on:

- the nature, extent and outcomes for employees and families from the industrial changes that are taking place in the economy;
- the changes taking place in communities, especially as our population ages and we experience further changes in patterns of work, population mobility and family formation;
- the education and health interventions that are more likely to provide improved outcomes; and
- the outcomes - both positive and negative - achieved for citizens, families and the community as a whole from government programs and services.

In recognition of the demands to deliver greater public value and in acknowledgement that data integration is the future for all statistical agencies, in late 2015, the ABS decided and announced that for the 2016 Census, the time frame in which names and addresses are retained before being

destroyed would be extended from the end of the Census data processing period (about 18 months after data collection) to when there is no longer any community benefit to their retention.

Subsequent to that decision, concerns were raised in the media that the ABS was retaining names indefinitely. The ABS responded to these concerns in April 2016 by committing to the destruction of names from the 2016 Census no later than August 2020. This decision was considered by the ABS to provide a balance between the use of Census data and the extensive privacy protections in place for the 2016 Census. It was also considered to counter the concern that name and personal information could be used at a later stage for as yet undetermined but undesirable purposes. Key stakeholders were advised of this decision and the ABS website information was updated.

As part of the ABS approach to 'privacy by design' outlined in Section 4.2, the ABS also decided that names and addresses will not be used directly in data integration projects. Instead, names and addresses will be used by the ABS to generate anonymous keys that can be used in approved data integration projects. The use of anonymised names during the linkage process will ensure that Australians can have confidence in both the quality of the data that is being used to support decisions as well as the proactive management of privacy.

The ABS will use a cryptographic hash function to anonymise name information prior to use in data linkage projects. This function converts a name into an unrecognisable value in a way that is not reversible. There are a number of cryptographic methods that could be used, and the ABS is currently in discussions with international experts in cryptography to determine the most appropriate cryptographic method ahead of the 2016 Census Data Enhancement program commencing in mid-2017.

This anonymised version of name will be used with other linkage variables to produce an anonymised linkage keys. Anonymised linkage keys will therefore vary from project to project depending on the characteristics of the datasets to be linked and the variables in those datasets that are available for linkage. The ABS is not creating a unique 'virtual identifier' and will not use the commonly used 'Statistical Linkage Key' (i.e. the 'SLK581') method⁷ as its anonymous linkage key method – this has been incorrectly assumed by a number of commentators.

The 2016 approach is an incremental change to the transparent Census Data Enhancement program undertaken with the 2006 and 2011 Census. Names and addresses have been collected in every Census and retained for about 18 months after collection in recent Censuses (and for longer in earlier Censuses) for statistical purposes. As outlined in Section 11.1, the ABS commenced using names and addresses to enhance Census data through data integration in the 2006 Census, and this was expanded with the 2011 Census.

The ABS's decision in relation to retaining names from the 2016 Census in no way changes the ABS practice or legal obligation to ensure that no information would be released by the ABS in a way that

⁷ SLK581 is a privacy-preserving tool used extensively in Australian data linkage projects. It is made up of the second, third and fifth letters of surname or family name, the second and third letters from the first name, date of birth, and sex. However, other privacy-preserving approaches, such as the approach described above for the 2011 Census, offer greater privacy protection, while allowing high quality data linkage. The ABS will not use the SLK581 method to produce anonymised linkage keys using 2016 Census data.

would enable users of Census data to identify any particular individual or household.

11.3 The process undertaken to introduce the changes – internal consideration and external consultation

As described in Section 4, the ABS embraces privacy-by-design principles. Privacy by design is a methodology that aims to ensure that privacy is considered before, at the start of, and throughout the development implementation of initiatives that involve the collection and handling of personal information – that privacy is intentional, not ad hoc.

The ABS started considering its approach to the 2016 Census Data Enhancement program in 2013 with a number of papers discussed in internal governance committees.

In 2014 the ABS commissioned Colmar Brunton, a market research company, to conduct a series of focus groups in order to understand contemporary community views on the ABS's statistical data integration plans ahead of the 2016 Census.

A series of 16 one-hour focus groups involving 74 people were held in regional and metropolitan areas nationwide. This included targeted focus groups for Aboriginal and Torres Strait Islander people, and people from culturally and linguistically diverse backgrounds.

The focus group testing found that the ABS was seen as a trustworthy organisation producing important data for government decision making. The vast majority of participants had confidence that the personal data they provide to the ABS is kept safe and secure.

The key themes that emerged from focus group consultations were:

Public benefit – participants generally agreed that statistical data integration undertaken by the ABS should only occur where it provides overall benefit to the public

Quality – the quality of information for decision making was seen as very important, with many participants emphasising the value of quality

Transparency – participants emphasised the need for transparency and clear information as part of the Census collection activities

Security – participants also emphasised the need for strong security in addition to strong privacy and confidentiality practices.

More specifically, feedback from focus group testing indicated a general level of support for retaining names and addresses from the 2016 Census for the purpose of data integration in the public benefit. There was strong community support for high quality data linkage, and acknowledgement that retaining name and address information was important to achieving high quality linked datasets. The majority of people felt that the use of anonymised names struck an appropriate balance between improving the quality of statistical information and safeguarding privacy. In cases where the linked datasets had not utilised an anonymised name linkage key, and therefore had a lower rate of successful linkages, participants expressed concern about the quality and usefulness of the data and in particular the quality of decisions based on poor quality data.

In working through examples, focus groups were generally comfortable with existing and proposed ABS protections to preserve privacy and confidentiality but emphasised the importance of the ABS being transparent about how it handles people's personal information and that the appropriate security practices were in place.

On 20 August 2015, the ABS published *Census of Population and Housing: Nature and Content, Australia, 2016*⁸, which advised that for the 2016 Census "the ABS is currently considering the retention of name and address information for statistical purposes, under stringent controls". This publication was accompanied by a media release.

The ABS invited public comment on the proposal to retain names and addresses for longer from the 2016 Census by issuing a media release⁹ and accompanying statement of intent¹⁰ on 11 November 2015. This was consistent with the ABS's value of transparency to the Australian public around how it collects and uses data. Direct consultation was undertaken with each State and Territory Privacy Commissioner and the Australian Information Commissioner in 2015.

A Privacy Impact Assessment was conducted to assess the potential risks the retention of names and addresses from responses to the 2016 Census might have to the privacy of individuals, and to assess the ABS's proposed approach to managing, minimising or eliminating those risks. The Privacy Impact Assessment was undertaken in accordance with the framework for Privacy Impact Assessments set out in the OAI's *Guide to undertaking Privacy Impact Assessments*. The ABS engaged with the Office of the Australian Information Commissioner as part of the Privacy Impact Assessment process.

The outcome of the Privacy Impact Assessment was that the proposal to retain names and addresses from responses to the 2016 Census was consistent with the functions of the ABS prescribed in the *Australian Bureau of Statistics Act 1975* and compliant with the provisions in the *Census and Statistics Act 1905* and the *Privacy Act 1988*, including the Australian Privacy Principles.

In relation to the proposed retention of names and addresses from responses to the 2016 Census, a small number of potential risks to personal privacy and public perception were identified. However, the Assessment concluded that in each case, the likelihood of the risks eventuating were 'very low'. It also concluded that robust processes to manage data and privacy were in place, and that these arrangements effectively mitigated these risks. A number of recommendations were made to ensure that approved business processes were put in place, including training and support materials for staff, as well as guidelines for ABS Census Field Officers and the publication of online responses to frequently asked questions to support queries from the public. It was also recommended that an internal audit be scheduled for the 2017-18 financial year.

⁸ Australian Bureau of Statistics, 2016, *Census of Population and Housing: Nature and Content, Australia*, cat. No. 2008.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/2008.0>

⁹ Australian Bureau of Statistics, 'ABS to conduct a Privacy Impact Assessment', media release, 11 November 2015, available: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/mediareleasesbyReleaseDate/080BA8A92516B088CA257EF9007CD28A?OpenDocument>

¹⁰ Australian Bureau of Statistics, 2015, Statement of ABS to conduct a Privacy Impact Assessment on retention of names and addresses from responses to the 2016 Census, available: <http://www.abs.gov.au/websitedbs/D3310114.nsf/home/Statement%20of%20Intent%20E2%80%93%20Privacy%20Impact%20Assessment%202016%20Census>

Following the outcomes of the Privacy Impact Assessment of the proposal, the direct consultation, and consideration of all the public submissions received, the ABS made the decision to retain names and addresses from the 2016 Census. This decision¹¹ was announced on 18 December 2015, accompanied by a media release¹² and publication of the Privacy Impact Assessment¹³ on the ABS website. Subsequent to that decision, in April 2016 the ABS responded to concerns by committing to the destruction of names from the 2016 Census no later than four years after collection, i.e. no later than August 2020.

Public commentary in the media

Public commentary in the media reflected a number of quite different privacy views related to the 2016 Census:

- those who have concerns about the privacy of Census data;
- those who have seen the 2016 Census privacy commentary as an opportunity to build support for greater privacy controls more generally across government, business and society; and
- those who have issues with national security policy and legislation and have drawn spurious links between national security and Census data for statistical purposes.

While the last two aspects provide important context, they are beyond the responsibility of the ABS, and accordingly the ABS has not responded to these dimensions.

There are a number of perspectives on the issue of privacy and the 2016 Census:

- Collection of Census data including name is compulsory. The compulsory collection of name was affirmed in legal advice as mentioned in Section 6.1.
- Collection of Census data is necessary for worthwhile statistical purposes. Section 6 highlights this aspect.
- ABS has legislative, cultural, technical and methodological dimensions in place that protect and preserve the privacy of individual information while we make effective use of the information to produce statistics that inform decision making (See Sections 1.2 and 4.3 for more information).
- Over the last decade, the ABS has enhanced its technical and methodological capabilities to use Census and other data to produce valuable statistics with greater privacy protections than were previously available to the ABS pre-2005 (refer to Sections 2.6 and 4.3 for more information).
- National statistical offices in other countries that have similar legislative requirements and technical capability as the ABS are making more effective use of their Census collection data to produce policy-relevant statistics with no actual or perceived threat to privacy. A number of

¹¹ <http://www.abs.gov.au/websitedbs/D3310114.nsf/home/Retention+of+names+and+addresses+collected>

¹² Australian Bureau of Statistics, 'ABS response to Privacy Impact Assessment', media release, 18 December 2015, available: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/mediareleasesbyReleaseDate/C9FBD077C2C948AECA257F1E00205BBE?OpenDocument>

¹³ Australian Bureau of Statistics, 'Privacy Impact Assessment', December 2015, available: [http://www.abs.gov.au/websitedbs/D3310114.nsf/4a256353001af3ed4b2562bb00121564/170fd5a4b684aa3eca257f1e0021a392/\\$FILE/ABS%20Privacy%20Impact%20Assessment%202016%20Census.pdf](http://www.abs.gov.au/websitedbs/D3310114.nsf/4a256353001af3ed4b2562bb00121564/170fd5a4b684aa3eca257f1e0021a392/$FILE/ABS%20Privacy%20Impact%20Assessment%202016%20Census.pdf)

these countries (e.g. Canada and New Zealand) retain name information for their Census indefinitely¹⁴, without any public concerns.

- Privacy of information is important to the ABS and the community. However, this also needs to be seen alongside the proposed community benefits from use of personal data to produce reliable statistics, as well as the mechanisms available at the ABS to produce statistics while preserving privacy. The 2016 Census public commentary has predominantly focussed on the first aspect while largely ignoring the second and third aspects.
- Community attitudes to privacy and trust in the ABS to secure and effectively use personal data to produce statistics of value to the community appear to be quite different from the views of some public commentators who may have presumed that their opinions are widely shared across the Australian community. The public sentiment testing conducted by the ABS around the 2016 Census clearly shows very limited privacy concerns amongst the community towards the ABS and the 2016 Census (refer to Section 8.5 for more information).

The commentary regarding the 2016 Census and privacy had the following features:

- Claims made about privacy risks, including from a former Australian Statistician (1995 to 2000) and a very small number of ex-ABS staff, appear to have been implicitly accepted by the mainstream media without being seriously tested or substantiated. Evidence from the 2016 Census (Section 10) shows that fears reported in the media do not reflect the views or behaviours of the general public.
- The ABS was rarely approached for its perspective on privacy related stories. Some journalists did claim to try to get the ABS view from searching the ABS website, others did not do that (a set of Frequently Asked Questions published on the ABS website are provided at Appendix 12). Other journalists appeared to seek their information from the Australian Privacy Foundation which had published a webpage titled, *The problems with the 2016 Census*¹⁵. The ABS met with the Australian Privacy Foundation about these matters and they continued to reflect their views irrespective of ABS explanations of facts and process. Appendix 13 outlines the claims made on the Australian Privacy Foundation webpage and the ABS response to these claims.
- The ABS is aware of a number of instances where the community benefit of what the ABS was proposing to deliver from the 2016 Census was not able to get a reasonable representation in the media, through editing of material and difficulties some expert researchers had in having their views published.

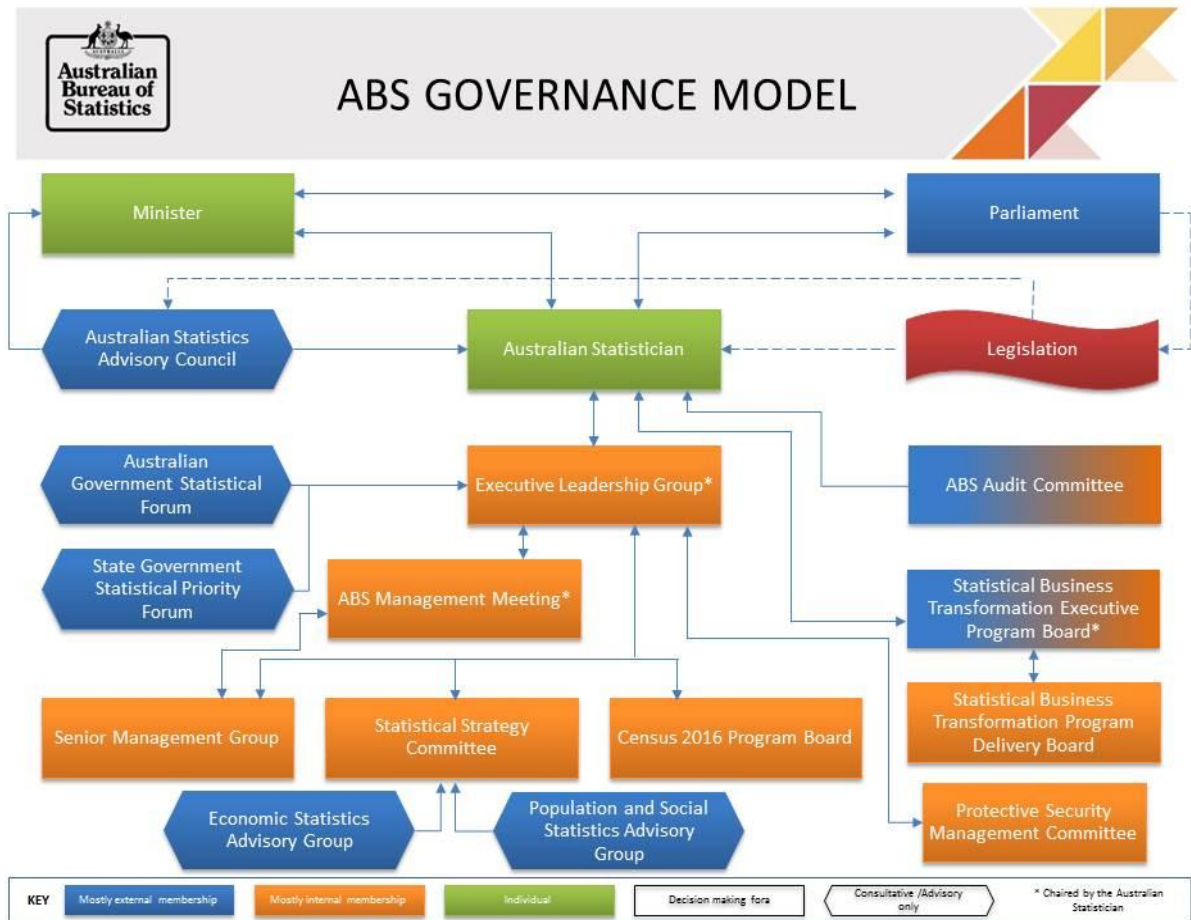
¹⁴ Note the ABS decision is to retain names and addresses for as long as there is a community benefit or up to four years after collection (i.e. August 2020), whichever is earliest. Unlike in many other countries, names will not be held indefinitely.

¹⁵ Australian Privacy Foundation, 'The Problems with the 2016 Census', April 2016, available: <https://www.privacy.org.au/Campaigns/Census2016/>

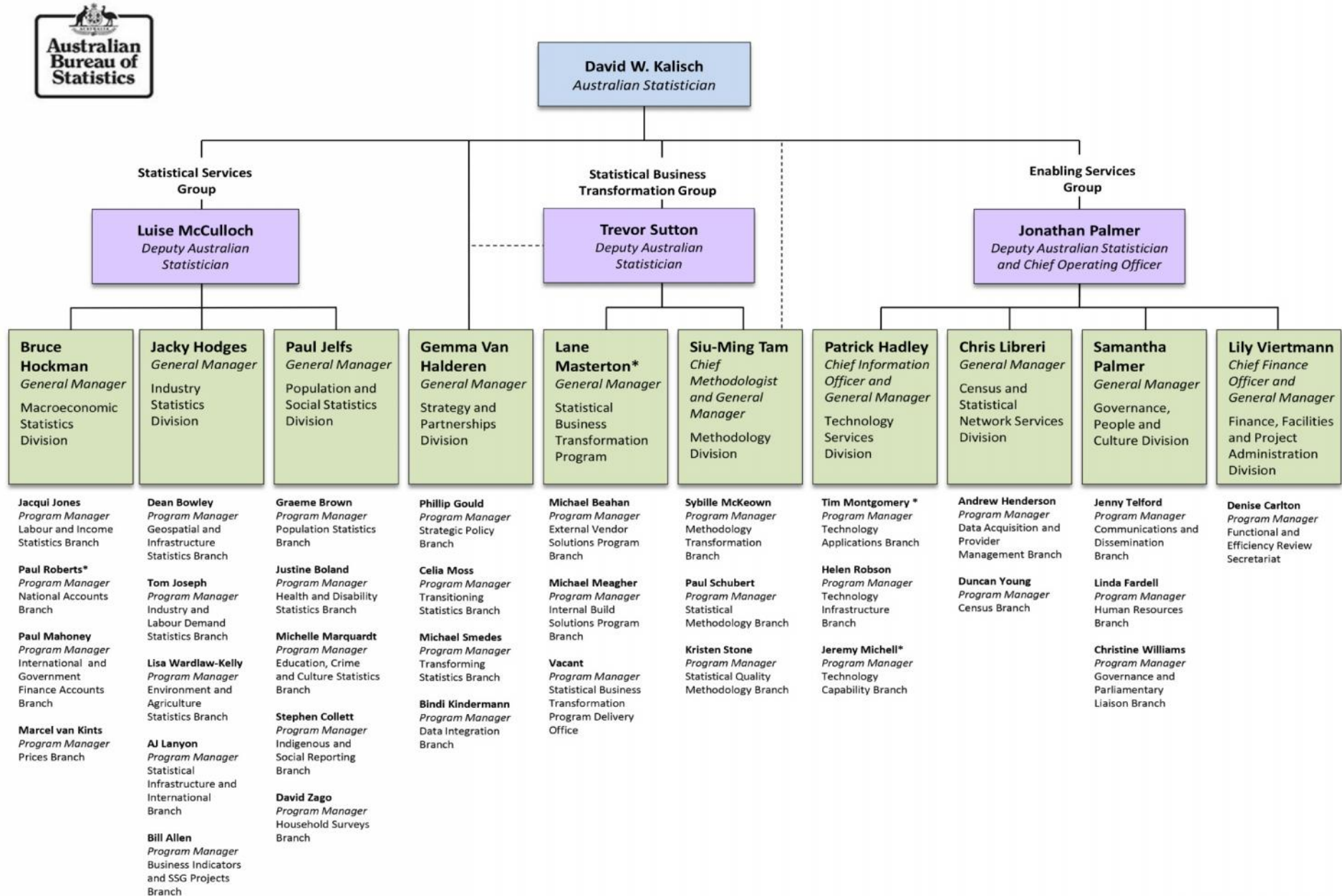
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APPENDIX 1 - ABS GOVERNANCE MODEL



APPENDIX 2 - ABS ORGANISATIONAL STRUCTURE, AS AT 1 SEPTEMBER 2016



*Individual is acting in this role

APPENDIX 3 - TIERS OF STATISTICAL PROGRAMS

STATISTICAL PRODUCTION		
PROGRAM NAME	TIER	DESCRIPTION
Aboriginal and Torres Strait Islander Statistics	2	Other important statistical work that is currently undertaken to meet identified user requirements that could be deemed as falling beyond tiers 1 and 2
Agriculture Statistics	2	Agricultural Census (partly user funded by Meat and Livestock Australia and Australian Egg Corporation) Rural Environment and Agriculture Commodities Survey
	3	Foreign ownership of agricultural businesses, land and water entitlements Wool Receipts, Purchases and Sales Survey Measures of livestock slaughter (partly user funded by Meat and Livestock Australia and Australian Pork Limited) Land management practices (e.g. cropping, soil management) (user funded by Department of Agriculture and Water Resources)
Business Indicators ¹	1	Business activity collected via three surveys: Private New Capital Expenditure and Expected Expenditure, Quarterly Business Indicator Surveys and Retail Trade. Business Characteristics Survey Dwelling and other building approvals Construction related gross fixed capital formation
	2	Mineral and petroleum exploration Business demographics program
Census of Population and Housing	1	Census of Population and Housing
Crime and Justice Statistics	2	Crime and justice statistics and research (partly user funded by Department of Social Services)
	3	National corrective services statistics National recorded crime offender statistics National recorded crime victim statistics National statistics on federal defendants, sentence quantum, federal offenders and corrective services (All are user funded by various jurisdictional agencies related to Police, Courts and Correctional facilities and the Attorney-Generals Department)

¹ Used to compile the National Accounts

STATISTICAL PRODUCTION		
PROGRAM NAME	TIER	DESCRIPTION
Culture and Recreation Statistics	3	Frequency of visits and characteristics of people who attend a range of cultural venues and events (user funded by Ministry for the Arts)
Demography	1	Estimated Resident Population Births and Deaths Overseas Arrivals and Departures Migration and Australian Historical Population statistics
	2	Population projections Regional population growth
Education and Training Statistics	2	National Schools Statistics Collection Qualifications and Employment Outcomes Survey Survey of Education and Work Work Related Training and Adult Learning Survey
	3	Childhood Education and Care Survey Annual National Early Childhood Education and Care (user funded by Department of Education) International Assessment of Adult Competencies (currently not funded but previously funded by Department of Education)
Environment Statistics	2	Environmental accounts, including Water Account, energy accounts and land accounts (partly user funded by Department of Industry, Innovation and Science)
	3	Wealth Accounting and Valuation of Ecosystem Services (a program of the World Bank, funded by Department of Foreign Affairs and Trade) Employment in Renewable Energy Activities (funded by the Australian Renewable Energy Agency) Assistance to Department of the Environment for 2016 State of the Environment Report (partly user funded by Department of the Environment)
Financial Statistics	1	Data collected from the Australian Prudential Regulation Authority and the Managed Funds Survey ¹
	2	Housing finance statistics
	3	Quarterly information on the assets and liabilities of securitisers Lending finance (commercial, personal and lease finance commitments)

¹ Used to compile the National Accounts

STATISTICAL PRODUCTION		
PROGRAM NAME	TIER	DESCRIPTION
Geospatial Solutions	1	Capability to support geospatial functions associated with the Census of Population and Housing
	3	<p>Capability for production of the Land Account for the Environment program</p> <p>Provide solutions to dissemination methods (Google Earth and geographic grids)</p> <p>New geospatial techniques and data sources to support Carbon Farming Initiative (user funded by Department of Agriculture)</p>
Health and Disability Statistics	2	<p>Statistics relating to causes of death</p> <p>Health and disability statistics including: National Health Survey (partly user funded by Department of Health) and National Aboriginal and Torres Islander Health Survey (funded by Department of Health and Department of Prime Minister and Cabinet)</p> <p>Survey of Disability, Ageing and Carers (user funded by jurisdictions, Department of Social Services and Department of Health)</p> <p>HealthCare Pathways (user funded by National Health Performance Authority)</p>
	3	<p>Information for the analysis of family formation and structure</p> <p>Patient Experience Survey</p> <p>Private Health Establishments Collection (partly user funded by Department of Health)</p>
Industry and Labour Demand Statistics	1	<p>Economic Activity Survey¹</p> <p>Survey of Average Weekly Earnings</p> <p>Major Labour Costs¹</p> <p>Survey of Employee Earnings and Hours</p> <p>Survey of Employment and Earnings</p> <p>Water Supply and Sewerage Supply/Use Survey</p>
	2	Job Vacancies Survey
	3	<p>Industrial disputes</p> <p>Survey of Tourist Accommodation (user funded by Austrade)</p> <p>Tourism satellite account (user funded by Austrade)</p>

¹ Used to compile the National Accounts

STATISTICAL PRODUCTION		
PROGRAM NAME	TIER	DESCRIPTION
Innovation and Technology Statistics	2	Business Longitudinal Analysis Database (user funded by Department of Industry, Innovation and Science).
	3	Household Use of Information Technology collection Internet Activity Survey Measures of research and development undertaken by businesses, governments, higher education institutions and private not-for-profit organisations Venture Capital and Later Stage Private Equity activity (user funded by Department of Industry, Innovation and Science)
International Accounts ¹	1	Australia's balance of payments estimates International investment statistics International merchandise trade International trade in services statistics
	3	Survey of Foreign Currency Exposure (user funded by Reserve Bank of Australia)
Labour Supply Statistics	1	Labour Force Australia Survey
	2	Barriers and Incentives to Labour Force Participation Characteristics of Employment Participation, Job Search and Mobility Retirement and Retirement Intentions Work Related Injuries
Living Conditions Statistics ¹	1	Household Expenditure Survey Survey of Income and Housing
Migrant Statistics	2	Characteristics of migrants, migrant economic outcomes and migrant settlement outcomes (partly user funded by Department of Immigration and Border Protection and Department of Social Services)
National Accounts	1	Quarterly and annual statistics of Gross Domestic Product and its components Input-output tables
	2	Annual productivity statistics including annual estimates of multi factor productivity statistics Annual state accounts

¹ Used to compile the National Accounts

STATISTICAL PRODUCTION		
PROGRAM NAME	TIER	DESCRIPTION
Prices	1	Consumer Price Index Wage Price Index Producer Price Indexes International Trade Price Indexes Pensioner and Beneficiary Living Costs Index
	2	Residential Property Prices Indexes Estimates of the Total Value of the Dwelling Stock
Public Finance	1	Government Finance Statistics ¹
Regional Statistics	2	Data by Region (national regional profiles)
	3	Regional economic data
Social Conditions Statistics	3	Longitudinal Survey of Australian Children Personal Safety Survey General Social Survey (All partly user funded by Australian and state and territory governments)
Transport Statistics	2	Motor Vehicle Census
	3	New Motor Vehicles Sales Freight Performance Measurement Project (unfunded) Survey of Motor Vehicle Use

¹ Used to compile the National Accounts

APPENDIX 4 - ABS TRANSFORMATION, A SUMMARY OF ACHIEVEMENTS 2015-16



Transforming the ABS 2015–16

Our transformation is the key to unleashing the power of statistics for a better Australia

Key Transformation achievements to date

ENVIRONMENT	STRATEGY	GOVERNANCE
 <p>Working with stakeholders to further develop the future of official statistics.</p> <p>Established a new Population and Social Statistics Advisory Group – to complement the Economics Statistics Advisory Group, and participated in a blue sky workshop held by the Australian Statistics Advisory Council</p> <p>Trust in the ABS has remained high, 81 per cent of the general public and 100 per cent of informed users trust the ABS[^]</p> <p>Extensive consultation with key stakeholders such as the Treasury, the Reserve Bank of Australia, Prime Minister and Cabinet, Departments of the Environment; Social Services, Health; Industry, Innovation and Science; and Education and Training</p> <p>93% of key stakeholders feel their relationship with the ABS has improved^{**}</p> <p>ABS DataLab trial generated an increase in registered users of microdata products, up 46% compared to 2014–15</p> <p>96% of print articles cited ABS statistics without quality concerns⁺</p>	<p>ABS Corporate Plan announces the Transformation Agenda</p> <p>Forward Work Program documents ABS priorities for 2015–16</p> <p>Statements of Expectations and Intent agreed with the Treasurer</p>  <p>Whole of government public data management and data integration initiatives, including the Multi-agency Data Integration Project, the Linked Employer-Employee Dataset and Business Longitudinal Data Analysis Environment (previously known as the Expanded Analytical Business Longitudinal Database)</p> <p>Submission to the Productivity Commission's inquiry into Data Availability and Use</p>  <p>Decrease in the burden on businesses and households, including the phasing out of paper forms for business surveys over the next four years</p>	<p>Restructured to prioritise the Census, Transformation, strategic partnerships and communication</p>  <p>Executive Program Board established for Statistical Business Transformation Program, with external members prominent</p>  <p>Review of policies and legislation underway</p> <p>Statistical risk management planning for main economic indicators and estimated resident population</p>  <p>New Statistical Strategy Committee established to provide single oversight of ABS statistical programs</p> <p>ABS Enterprise Agreement 2016 endorsed by staff</p>

[^] Community Trust and ABS Statistics Survey, October 2015

⁺ Based on assessment of articles in seven major newspapers citing ABS statistics (located through a contracted media monitoring service)











^{**} 2016 Stakeholder Relationship Health Assessment



Transforming the ABS 2015–16

Our transformation is the key to unleashing the power of statistics for a better Australia

Key Transformation achievements to date

PEOPLE	CULTURE	INFRASTRUCTURE
 <p>Increased the number of women in our senior executive – from 24 per cent to 46 per cent</p>	<p>Senior Executive Staff commitment to leadership behaviours of timely action, empowered staff and a 'One ABS' focus</p>	<p>Funding secured thanks to a historic \$257 million investment by government</p>
 <p>360 degree feedback provided to all Senior Executive Staff</p>	 <p>ABS Change Network established: bringing together change champions across the ABS</p>	 <p>ABS National Data Acquisition Centre opened in Geelong as a new centre of excellence for data capture</p>
<p>Staff secondments to federal, state and territory government departments including with the Treasury, Department of Finance, and Prime Minister and Cabinet. We also have seconded officers to each State and Territory Government as Strategic Partnership Managers</p>	 <p>ABS Engagement Strategy in place to improve and expand external partnerships</p>	 <p>Improved security and access management procurement finalised</p>
 <p>Positive results in the 2015 State of the Service Census</p>	 <p>Implementing new and improved ways of working with a focus on high performance</p>	<p>Rollout of the new and more flexible (NextGen) desktop environment completed, enhancing security while increasing flexibility</p>
<p>ABS staff member Joseph Chien awarded a 2016 Sir Roland Wilson Scholarship</p>	 <p>Renewed focus on improving knowledge management</p>	 <p>Five of our nine offices have migrated to activity based working, giving greater access to flexible working arrangements and reducing capital investment in office facilities</p>
<p>Youmpla Network to support Aboriginal and Torres Strait Islander staff</p>		<p>Procurement for the ABS Enterprise Data Management Environment was underway</p>

APPENDIX 5 - STATISTICAL DATA INTEGRATION

In simple terms, data integration is a well-established method of bringing together existing information about people, places, businesses or events to produce new statistics, new research, new policy insights and new datasets for analysis, policy development and program evaluation. These methods were developed considerably in the 1990s to enable the linkage of data at the unit record level, based on information common to both datasets.

For the integration of data relating to individuals, the common information might be name and address, or it might be demographic information such as date of birth, gender and locality. In some instances, common identifiers might be available for use across datasets, and these, or encoded versions of them, used. For business information, the common information may similarly be name and address or some form of available identifier such as an Australian Business Number (ABN).

As Australia's official statistical agency, the ABS uses data integration methods for statistical purposes.

Using data integration for statistical purposes means using it to describe characteristics of groups within the population, and relationships that might exist between variables such as social and economic conditions, behaviours and outcomes.

Data for statistical purposes cannot be used in a way that has a direct effect on the individual other than in relation to developing statistical insights about groups or patterns. For example, it cannot be used in administrative processes to identify individuals who are, or are not, eligible for welfare services, nor to assess compliance with requirements such as those of the Australian Taxation Office or a Court of Law.

The ABS's data integration facility only undertakes data integration for statistical and research purposes where there is a strong public benefit in doing so. The ABS requires all data integration project proposals to go through a rigorous assessment and approval process to ensure the project provides a significant public benefit and takes a privacy-by-design approach. In addition, staff members assigned to a project are never able to see all of an individual's information together at any point of the data integration process and data access rights are only provided on a 'needs to know' basis – this is known as the 'separation principle'. These protections are in addition to existing strong protections that all ABS staff are legally bound to never release personal information to any individual or organisation outside of the ABS.

Investments in ABS data integration capability and methodological expertise over the past decade has seen strong demand from governments, academics and researchers use of the ABS data integration facility. The ABS is transitioning from undertaking a small, discrete array of data integration projects to a rich, diverse and expanding program of projects across social, economic and environmental domains.

To date, over 100 separate data sources have been used in 44 data integration projects internally and in partnership with over 25 different organisations including Australian government and state government departments and a small number of non-government organisations.

The ABS has used data integration in the production of several nationally significant statistical and research datasets. Some of these are detailed below.

Business Longitudinal Analysis Data Environment

The ABS and the Department of Industry, Innovation and Science have developed the Business Longitudinal Analysis Data Environment (BLADE), which contains detailed information on the characteristics and finances of Australian businesses.

Formerly known as the Expanded Analytical Business Longitudinal Database (EABLD), this integrated data environment draws on several years of administrative data from the Australian Taxation Office (ATO) and survey data from the ABS, enabling analysis of businesses over time and the micro-economic factors that drive performance, innovation, job creation, competitiveness and productivity. The BLADE therefore improves the evidence base for policy development and reform.

For example, the BLADE has been used to examine the contribution of start-ups to job creation in the Australian economy, revealing that it is young small to medium enterprises that make the greatest contribution to overall jobs growth.

Australian Census Longitudinal Dataset

The Australian Census Longitudinal Dataset (ACLD) brings together a 5% random sample of records from the 2006 Census with corresponding records from the 2011 Census. This provides a unique opportunity for researchers to access a very large and detailed longitudinal dataset and examine pathways and transitions for different population groups.

Following the 2016 Census, the ABS will expand the ACLD to include a third time point. Over time, the ACLD will continue to grow in value as records from each successive Census are linked, providing a much more detailed longitudinal picture of changing patterns in social and economic conditions in the lives of Australians.

The ACLD was created by linking data from the 2006 Census and the 2011 Census using personal characteristics and geographic region. The utility of the dataset has also been enhanced by linking the ACLD with selected administrative datasets, including information on migrant settlements. This allows outcomes of particular groups of migrants (such as those on study, family or humanitarian visas) to be examined using the range of topics collected in the Census.

The ACLD is available to registered users in ABS TableBuilder, where users can create their own customised tables. In addition, the ACLD is available in the ABS DataLab facility as a microdata product that enables researchers to unlock the full power of the longitudinal Census data by performing more detailed analytical techniques using a range of statistical software packages.

Researchers and policy makers have used the ACLD to:

- better understand the factors associated with the increase in people choosing to identify as Aboriginal or Torres Strait Islander;
- investigate employment outcomes for retrenched workers leaving the motor vehicle industry; and
- investigate changes in family relationships and fertility.

Multi-agency Data Integration Project

The Multi-agency Data Integration Project (MADIP) is a collaborative partnership between five Australian Government agencies: Department of Health, Department of Social Services, Department of Human Services, ATO, and the ABS.

MADIP is currently in an evaluation phase, with the partner agencies working together to maximise the value of existing data, address and resolve barriers to data sharing, and create an enduring data resource with cross-portfolio information readily available to support analysis and evaluation as it is needed.

MADIP has at its core a high quality snapshot of 2011 data, combining administrative data on health services, income tax and government support payments with the detailed demographic and family data from the Census.

An evaluation of the integrated data and its potential to inform policy development and evaluation is currently being undertaken by data experts from all five partner agencies. Preliminary analysis suggests that this project has significant potential to improve Australia's health, welfare and education systems through a better understanding of the impact of social and economic policies and industry changes.

The shared vision for this resource is that the dataset will be expanded over time (both longitudinally and in terms of new data), and will become available for broader use by other Australian Government agencies, states and territories, academics, and the public.

Linked Employee–Employer Database

The foundational Linked Employee–Employer Database (LEED) project joins personal income tax data from the Australian Taxation Office with business-level data from the EABLD, linking person-level data with business-level data for the first time.

This foundation project represents an important first step towards a future LEED, which will contain data linked across multiple years and include more detailed socio-economic and demographic information relating to employees. Through further linkage with other datasets, additional characteristics could be used to explore the drivers of firm-level performance, such as the educational qualifications of employees.

The ultimate longer term goal is to enhance understanding of productivity, changes in employment by industry, entry and exit to the labour market, and other important labour market dynamics. This addresses a longstanding information gap in Australian labour market statistics and provides a solid evidence base for policy development and evaluation.

APPENDIX 6 - NEW ZEALAND INTEGRATED DATA INFRASTRUCTURE (IDI)

History of the IDI: New Zealand Government investment in data integration

Statistics New Zealand (NZ) has been undertaking data integration since 1997, when the New Zealand Government decided that Statistics NZ should be the custodian of integrated datasets in order to ensure public confidence in the protection of individual records.

This decision led to the development of a range of linked administrative datasets, including a linked employer-employee dataset, integration of employment outcomes and tertiary education data, and a business longitudinal dataset using tax data.

In March 2011, the NZ Cabinet endorsed a proposal to integrate administrative migration data with the linked datasets already created by Statistics NZ. This decision, alongside the 2011 Budget decision to invest in a Statistics NZ organisation wide change program, provided the resources to develop a prototype IDI.

In 2013, the NZ Cabinet agreed to expand the IDI to enhance capability across government to share and use existing data in order to deliver better public services and outcomes for New Zealanders (see Treasury paper¹). This expansion is an ongoing process; new datasets are prioritised for inclusion by a cross-sectoral advisory group, and are subjected to careful assessment of privacy and other risks prior to being added to the IDI (refer to the latest Privacy Impact Assessment² for the IDI).

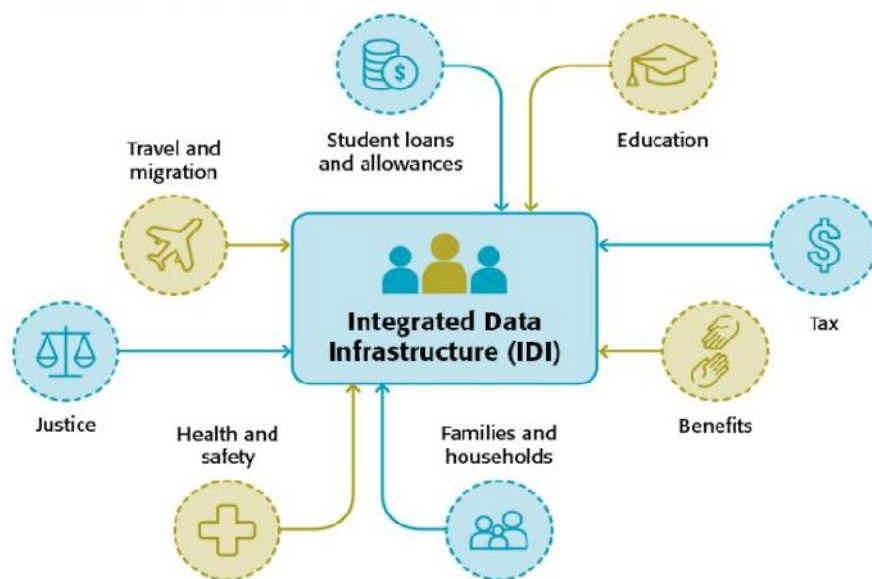
What is the IDI?

The IDI links individual-level records from a range of organisations to provide a powerful resource used by government and the research community. It includes administrative data from 12 government agencies with survey and Census data from Statistics NZ, as well as data from private sources such as NGOs, Indigenous tribes, and the private sector. Details of the data available in the IDI are given online³ and in Figure 1, attached below; an overview is provided in the following illustration:

¹ Available online at: <https://www.ssc.govt.nz/sites/all/files/bps-analysis-for-outcomes-cabpaper.pdf>

² Available online at: http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure/keep-data-safe/privacy-impact-assessments.aspx

³ http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure/idi-data.aspx



A key aspect of the IDI is that data integration and privacy go alongside each other. There are multiple security layers in place to ensure the data is not misused. Data is anonymised at the start and confidentialised at the end. Access to the IDI only occurs under stringent conditions and Statistics NZ's 'five safes' framework⁴ governs the access to microdata, including to the IDI: safe people, safe projects, safe settings, safe data, and safe output.

Access to the IDI is via Statistics NZ data laboratories (including virtual arrangements) and is available to approved researchers who comply with rules and undertakings to ensure data security. All activity is audited and outputs vetted. The 'trusted access' approach is consistent with the international benchmarks for mitigating privacy risks while enabling the right users to access and use the data they need.

The IDI is widely used for answering complex policy questions, allowing for efficient evaluation and research analysis, and the production of statistical outputs on pathways, transitions, and outcomes. This research has supported the investment approach to welfare and justice, as well as better crime information, health outcomes, and economic analysis. More specifically, it has been central to government decision-making and is used to provide a statistical link between programs and liabilities, allowing for cost-benefit analysis of spending programs to target early interventions and for the evaluation of government program delivery. A list of IDI research projects is available online⁵.

Demand for IDI data and capacity to use it have exceeded initial expectations. The size of the data analyst community has grown and current IDI use goes beyond those envisaged: it is becoming an important epidemiology tool, it has more utility for service delivery evaluation than was initially predicted, and there is more interest from non-government data providers than was expected.

The IDI has revolutionised the availability and use of data in New Zealand and has become an integral part of policy and decision-making. Ultimately, the IDI helps the Government and its

⁴ An overview of the five-safes framework is available online at http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure/keep-data-safe.aspx

⁵ http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/integrated-data-infrastructure/researchers-using-idi.aspx

agencies to prioritise and maximise the impact of expenditure, and to measure performance of initiatives.

Social Licence

There is widespread support for the IDI and Statistics NZ's management of it. This social licence is crucial as the IDI is linking and using data to an extent previously unseen. Recent research on social licence and perceptions about data collection and use showed the New Zealand public has an expectation that their data is used wisely and for public good. It also showed that Statistics NZ has a strong reputation as a 'data expert' and trusted custodian of public information.

However, as social licence can easily be lost, Statistics NZ is continuing to engage the public in an informed debate about social licence, intended to move them from naïve to informed trust. To this end, they are collaborating with the NZ Data Futures Partnership, a cross-sector group set up to help drive change across New Zealand's data-use ecosystem, who are leading the public conversation with New Zealanders about social licence for use of data for public good.⁶

In addition to the ongoing public engagement, an important factor for social licence is the fact that New Zealand's current legislative settings enable and protect Statistics NZ undertaking of data integration. A current review of the *Statistics Act 1975* will ensure that Statistics NZ can continue, and, potentially, within the social licence mandate, expand this work in the future.

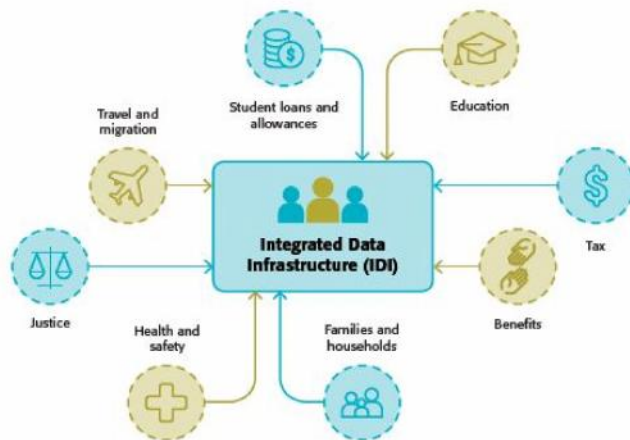
⁶ Statistics New Zealand submission to the Productivity Commission's public enquiry on 'Data Availability and Use' is available online at <http://www.pc.gov.au/inquiries/current/data-access/submissions>

Figure 1: Data in the IDI

Data in the IDI July 2016



Statistics New Zealand's Integrated Data Infrastructure (IDI) is a large research database containing de-identified microdata about people and households.



The IDI contains person-centred microdata from a range of government agencies, Statistics NZ surveys including the 2013 Census, and non-government organisations. For more information about data in the IDI, see www.stats.govt.nz/idi-data.

The Longitudinal Business Database (LBD) complements the IDI with microdata about businesses. For more information about data in the LBD, see www.stats.govt.nz/lbd.

Health and safety data

- ACC injury claims – from 1994
- B4 School Checks – from 2011
- Cancer registrations – from 1995
- Chronic conditions – from 2007
- General medical services claims – from 2002
- Health tracker – 2006–13
- Laboratory claims – from 2003
- Mortality – from 1988
- Immunisation – from 2006
- National non-admitted patient collection – from 2007
- Pharmaceuticals – from 2005
- PHO enrolments – from 2003
- Population cohort demographics and addresses – from 2004
- Mental health and addiction – from 2008
- Publicly funded hospital discharges – from 1988

Justice data

- Recorded crime: offenders – from 2009
- Recorded crime: victims – from 2014
- Court charges – 1992–2013
- Sentencing and remand – from 1998

Benefits and social services data

- Benefits – from 1990
- Youth services – from 2004
- Auckland City Mission – from 1996

Tax and income data

- Tax and income – from 1999

Education and training data

- Early childhood education – 2008–15
- Primary education – from 2007
- Secondary education – from 2004
- Tertiary education – from 1994
- Industry training – from 2001
- Targeted training – from 2001

Student loans and allowances data

- Student loans and allowances – from 1992

Travel and migration data

- Driver licence and motor vehicle registers
- Border movements – from 1997
- Visa applications – from 1997
- Departure and arrival cards – from 1997
- Migrant Survey – from 2012
- Longitudinal Immigration Survey of NZ – 2005–09

Family and household data

- 2013 Census
- Births, deaths, marriages, and civil unions – from 1840
- Child, Youth and Family – from 1991
- Household Economic Survey – from 2006
- Household Labour Force Survey – from 2006
- NZ Income Survey – from 2006
- Working for Families – from 2003
- Tenancy – from 2000
- Social housing – from 1980
- Survey of Family Income and Employment – 2002–10



APPENDIX 7 - KEY MEASURES OF STATISTICAL QUALITY FOR THE 2016 CENSUS

The key measures of statistical quality for the 2016 Census are:

Dwelling response rate – This measure tracks how many occupied private dwellings return a response in the 2016 Census. This measure is produced at the end of the processing phase. In the 2011 Census this response rate was 96.5%, and in 2006 it was 95.8%. It differs from the participation rates which are being tracked throughout the Census collection period.

Invalid responses will be found during processing. These include responses from dwellings that have been incorrectly classified as private dwellings but are actually a business or other entity that should not have been counted in the Census. Additional valid responses will also be found during processing that lead to new private dwellings being created such as where we find a new address that is in scope but not previously registered.

The processing operation also makes the final decision on whether private dwellings are to be counted as occupied or unoccupied on Census night.

The final participation rate is calculated at the end of the collection phase and the final dwelling response rate is not known at this time. However, the participation rate is the best proxy for the dwelling response rate until the dwelling response rate can be calculated. Because the 2016 Census is a different model to previous Censuses, with the considerable advances in management information a key feature of the 2016 Census, there is limited historical comparative information to draw on.

Person non-response rate – This measure tracks how many people identified to be in Australia on Census night did not return a response. It is different, but related, to the measure of Dwelling response. One of the main differences is that this measure includes all identified persons staying in non-private dwellings (such as hotels, hospitals, cruise ships, mining camps etc). The Dwelling response rate excludes non-private dwellings. Person non-response can only be calculated at the end of the processing phase after all the necessary processing activities are undertaken. Selected person characteristics, such as age and sex, are imputed for non-responding people to ensure a full and accurate dataset is produced.

The person non-response rate was 3.7% in the 2011 Census, an improvement over the 2006 Census which had a higher rate of 4.2%.

Net Under/Overcount of Dwellings and People – The Post Enumeration Survey measures the under and over coverage of both dwelling and people in the 2016 Census. It finds people who have been accidentally counted more than once in the Census and people who have been missed in the Census. It also finds dwellings that were not included in the Census and dwellings that were included in error or counted more than once. The difference between the under and overcount is the net outcome. The results of the Census are not adjusted for this net coverage outcome but they are used as critical inputs into the calculation of accurate high quality population estimates.

The 2011 PES found the net undercount for the 2011 Census was 375,000 people, or 1.7% of the population. This means the Census managed to count over 98% of all people in Australia on Census night. In 2006 the net undercount was 550,000 people, or 2.7%.

Item non-response rates – Historically one other measure of Census quality is item non-response rates – how many responses to each of the Census questions are left blank. This quality measure is not as relevant for online returns as it is for paper. The Census online form makes a subset of questions mandatory – which means respondents cannot submit a blank answer to specific questions. Also the ABS has seen in previous Census, people tend to answer all questions when completing the form online – noting the Census question on religion is the only actual optional question in the Census. Statistical quality is best judged by how well the responses to questions can be coded and classified during the processing operation.

APPENDIX 8 - TOPICS FOR THE 2016 CENSUS

The 2016 Census will include the same topics as in the 2011 Census. Minor changes to questions have been made, as appropriate, to ensure continuing relevance, such as updating income ranges and revising some response categories, or to improve data quality.

Information on each of the topics is published on the ABS website.⁷

As in previous Censuses, the 2016 Census will also include a question asking whether people agree to have their information retained by the National Archives of Australia as part of the Census Time Capsule. This question is not related to a Census topic as such and was made possible by an amendment to the *Census and Statistics Act 1905*.

Topics relating to persons

- Name
- Sex
- Age
- Residential status in non-private dwelling
- Registered marital status
- Aboriginal and/or Torres Strait Islander origin
- Usual residence at Census time
- Internal migration
- Australian citizenship
- Country of birth
- Year of arrival in Australia
- Country of birth of parents
- Main language other than English spoken at home
- Proficiency in spoken English
- Ancestry
- Religious affiliation
- Need for assistance
- Attendance at an educational institution
- Highest year of schooling completed
- Non-school qualifications
- Number of children ever born
- Income (individual)
- Labour force status
- Status in employment (now incorporates Employment type)
- Occupation
- Public or Private employer indicator
- Workplace address (and Journey to work)
- Industry of employment
- Hours worked
- Method of travel to work
- Unpaid work

⁷ Australian Bureau of Statistics, 'Census of Population and Housing: Nature and Content 2016', August 2015, cat no. 2008.0, available: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/2008.0>

Topics relating to households and dwellings

- Address on Census Night
- Family relationship (and Social marital status)
- Income (family and household income)
- Number of motor vehicles garaged
- Number of bedrooms
- Tenure type
- Landlord type (formerly named Rent/landlord type)
- Housing costs (formerly named Mortgage repayments)
- Dwelling internet connection
- Dwelling structure
- Location of private dwelling
- Type of non-private dwelling

APPENDIX 9 - 2016 CENSUS ENGAGEMENT

The ABS met with a number of organisations during the public consultation and review of the 2016 Census content and procedures. The ABS met with the following organisations:

- Anglicare Tasmania
- Atheist Foundation of Australia
- Australian Catholic Bishops Conference
- Australian Centre for Excellence in Local Government
- Australian Curriculum, Assessment and Reporting Authority
- Australian Federation of Islamic Councils: Muslims Australia
- Australian Human Rights Commission
- Australian Institute of Health and Welfare
- Australian Local Government Association
- Australian National Preventive Health Agency
- Australian Skeptics
- Australian Transportation Data Action Network
- Bureau of Transport Statistics (New South Wales)
- Chamber of Minerals and Energy (Western Australia)
- Christian Research Association
- Community Relations Commission for a Multicultural NSW
- Council of Australian Humanist Societies
- Council of Australian Jewry
- Department for Communities and Social Inclusion (South Australia)
- Department of Aboriginal and Torres Strait Islander and Multicultural Affairs (Queensland)
- Department of Communications (Australian Government)
- Department of Economic Development (Tasmania)
- Department of Health (Australian Government)
- Department of Health (Northern Territory)
- Department of Health (Victoria)
- Department of Health and Human Services (Tasmania)
- Department of Immigration and Border Protection (Australian Government)
- Department of Infrastructure and Regional Development (Australian Government)
- Department of Infrastructure Energy and Resources (Tasmania)
- Department of Planning and Infrastructure (New South Wales)
- Department of Planning, Transport and Infrastructure (South Australia)
- Department of Premier and Cabinet (New South Wales)
- Department of Premier and Cabinet (Victoria)
- Department of Primary Industries (Tasmania)
- Department of Primary Industries, Parks, Water and Environment (Tasmania)
- Department of Regional Development
- Department of Social Services (Australian Government)
- Department of State Development (Western Australia)
- Department of the Premier and Cabinet (Tasmania)
- Department of Trade & Investment (New South Wales)
- Department of Transport and Main Roads (Queensland)
- Department of Transport, Planning and Local Infrastructure (Victoria)
- Department of Treasury and Finance (Northern Territory)
- Department of Treasury and Finance (Victoria)

- Department of Veterans' Affairs (Australian Government)
- Diversity Council Australia
- Embassy of the Republic of Serbia
- Families Australia
- Federation of Ethnic Communities' Councils of Australia
- Forgotten Australians
- Gender Statistics Advisory Group
- Geoscience Australia
- Hindu Council of Australia
- Homelessness Statistics Reference Group
- Humanist Society of Victoria
- Intersex international
- Labour Statistics Advisory Group
- Monash University (Professor Emeritus Gary Bouma)
- National Health and Medical Research Council
- National LGBTI Health Alliance
- National Sea Change Taskforce
- Office for Indigenous Affairs (within the Department of Prime Minister and Cabinet (PM&C))
- Office for Women (within PM&C)
- Ombudsman Tasmania
- People Strategies
- Population Estimates Technical Workshop
- Public Health Information Development Unit, University of Adelaide
- Department of Treasury and Trade (Queensland)
- Rationalist Society of Australia
- Resources Industry Training Council
- SA Health
- Shelter Tasmania
- Special Broadcasting Service
- Telethon Institute of Child Health Research
- Tourism and the Arts (Tasmania)
- University of Tasmania
- Victorian Multicultural Commission
- West Australian Local Government Association
- Youth Network of Tasmania

In the year leading up to the 2016 Census, the ABS engaged with a number of Australian Government agencies in order to obtain assistance to enumerate groups in the Census that might otherwise be missed. Listed below is a list of key agencies, and the main assistance sought:

- Department of Defence: Provision of logistical and local Defence staff assistance to enumerate defence personnel, including those deployed on Naval ships and those residing at secure Australian bases; MoU negotiated to enable enumeration of US Marines deployed in Australia.
- Department of Health: Communication to aged care establishments to encourage them to nominate staff who could be employed by ABS to assist residents to complete the Census.
- Australian Federal Police (AFP): Notified AFP about nature and timing of Census field operations, including how to identify Census field officers.
- Department of Immigration and Border Protection (DIBP): MoU to obtain Australia-based immigration processing centre data; communication to incoming travellers and temporary work

permit holders about the Census; provision of assistance to enumerate DIBP staff on patrol boats at sea over the Census enumeration period.

- Department of Human Services: Assistance with field staff recruitment; utilising remote community networks.
- Department of Social Services: Engagement for homelessness enumeration; utilising multi-cultural liaison officer networks.
- Department of Foreign Affairs and Trade: Communication with embassies about Census, diplomatic staff and families not in scope of the Census.
- National Disability Insurance Agency: Communication to care providers about the Census and encouraging them to assist care recipients to complete the Census.
- Australian Electoral Commission: Sharing of resources and talent pool to enable successful recruitment of staff for both the 2016 Census and the 2016 Australian Election.
- Australian Human Rights Commission: Consultation with LGBTI advisor about addition of third response option for the question on the Census form about sex/gender.
- Office of the Australian Information Commissioner (OAIC) - Ongoing consultation involving multiple areas of the ABS, including consultation around privacy matters and the Census.
- Australian Sports Commission: Engagement to increase awareness of the Census among Aboriginal and Torres Strait Islanders and the youth demographic.
- Aboriginal Hostels Limited: Engagement to increase awareness of the Census among Aboriginal and Torres Strait Islanders.

In addition to this centralised engagement, Census Regional Management Units engaged with local offices of various government and community agencies to explore further opportunities to promote the Census, including:

- State/Territory Education departments
- State/Territory Health departments and hospitals
- State/Territory Correctional facilities
- State/Territory Police forces
- State/Territory Multicultural agencies
- State privacy commissioners
- Local government associations
- Regional development authorities
- Consulates and embassies
- Service providers for new migrants, multicultural groups, homeless and Aboriginal and Torres Strait Islanders
- Advocacy groups and peak bodies including health, human rights, disability and sexual/gender identity
- Churches, volunteer organisations and other community groups
- Aged care facilities
- Commercial accommodation providers

Further, the Australian Statistician sent messages about the Census to the departmental heads or CEOs of more than 100 Australian Government agencies and statutory bodies. The first of these messages was sent in June 2016 with the most recent update sent in early September. The Australian Statistician also emailed all heads of Premiers/Chief Ministers Departments and state Treasuries in August 2016.

APPENDIX 10 - SPECIAL AUDIENCE STRATEGIES

Special Audience Strategies

The ABS uses a range of approaches for specific population groups to ensure the coverage of people in Australia is as complete as possible. These strategies are designed, in consultation and collaboration with the relevant communities and/or service providers, to ensure these groups participate in the Census and accurate information is collected.

Targeted approaches were developed to optimise accessibility and inclusion of the following groups:

- Remote Aboriginal and Torres Strait Islander peoples – over 100 Remote Area Mobile Teams were formed and travelled to over 1,500 remote communities, outstations and town camps. At each location the teams employed local community members, where appropriate, as facilitators and undertook interviews of each household to ensure an accurate count. ABS developed a range of promotional materials adapted to Aboriginal and Torres Strait Islander audience.
- Urban Aboriginal and Torres Strait Islander peoples – of the 550,000 people whom identified as having Aboriginal and/or Torres Strait Islander origins in the 2011 Census, more than three-quarters lived in urban areas. This consisted of 190,000 in major cities, 120,000 in inner regional areas and 120,000 in outer regional areas. The 2011 Census Post Enumeration Survey showed an undercount of Aboriginal and Torres Strait Islander People living in capital cities of 19.8%⁸. The ABS focussed on improving this outcome through identifying advocates to promote the Census and to ensure no small geographic area had a low response rate (as there is some clustering of people who identify as Aboriginal and Torres Strait Islander, and other undercounted population groups).
- Defence personnel – The ABS worked directly with the Department of Defence to ensure that strategies were in place to accurately and conveniently ensure that all Defence staff are counted, including: staff on national exercises and in some cases deployed on operations overseas or at sea; staff on defence establishments; visiting international staff and staff with particular security concerns. The ABS promoted Census employment opportunities to Defence families.
- People with disabilities – The Census provides a range of different options to ensure the Census is accessible to everyone, including those with an illness, injury or disability. The online form was designed, tested and certified to meet accessibility standards and be used by assistive technologies such as screen readers. The ABS also produced large print, braille, audio and an AUSLAN form. The Census utilised the National Relay Service to support callers to the Census Inquiry Service and closed captioning was added to promotional videos. The ABS worked with a range of community organisations to ensure appropriate and sufficient

⁸ Note: many of these persons would have been counted in the Census, but had not identified as Aboriginal or Torres Strait Islander

support is in place for people with disabilities.

- People experiencing homelessness – The 2011 Census found that over 100,000 Australians were experiencing homelessness, including those that are sleeping rough, staying in supported or other temporary crisis accommodation and those staying in over-crowded or couch-surfing in private dwellings. Each of these circumstances requires a different enumeration approach to ensure adequate coverage and quality data outcomes. The ABS worked closely with the service sector in order to identify locations of rough sleepers and supported accommodation dwellings, as well as to support Census enumeration.
- People from culturally and linguistically diverse backgrounds – Australia's diversity is measured by the Census, with the 2011 Census showing that Australians came from over 200 different countries of origin and spoke over 300 different languages at home. The 2011 Census indicated 5.3 million people or 24.6% of the total Australian population were born overseas and 3.4 million of these persons were born in Non-Main English Speaking Countries. Strategies were developed to focus on newly arrived, short term and some established (e.g. elderly) migrant groups who may encounter barriers to participation in Census. Key components of the strategy were to engage with communities and community service providers, conduct public information sessions, develop a range of in-language promotional and assistance material, undertake an in-language campaign, employ bi-lingual and multi-lingual field staff, conduct fill-in-the-form sessions to provide direct assistance and utilise the Translator and Interpreter Service to support the Census Inquiry Service. The 2011 Census showed that proportionally, homes that spoke languages other than English were more likely to use the online form than homes that only spoke English.
- People travelling or away from their home on Census Night - Past Censuses identified a growing proportion of the population travel around the time of Census and therefore, are not within their own home (residence) on Census night, with a growing number travelling in remote areas. Strategies were developed to cover all people who are travelling within remote locations of the country and who may have been camping at small roadside stops or within remote National Parks and reserves. Census forms and online access codes were made available to travellers via a number of 'collection points' located across Australia - including businesses, such as roadhouses and truck stops, as well as State/Territory government agencies, such as Police Stations and tourist information centres. Internet access codes were also provided by email or text message to travellers who called the Census Inquiry Service.
- People living in mining camps and fly-in/fly-out workers – There are particular challenges in accurately counting people who are on mining sites at Census time, particularly those with transient worker camps, and all those that are working in fly-in fly-out (FIFO) or drive-in drive-out (DIDO) arrangements. The strategy adopted included: working with employers; employing staff to assist with form delivery, collection and completion; and targeted advertising materials.

- Older Australians – Older Australians have had high Census response rates and have traditionally required limited special strategies to support their participation. However, older Australians were identified as a group that could be negatively affected by the move to a digital-first strategy. For the 2016 Census the ABS put a range of measures in place to facilitate their participation. The ABS engaged with organisations such as the Council of the Ageing nationally and in each state and territory in order to discuss our proposed approach, and seek their assistance in communicating with older Australians. The ABS identified areas (containing 30% of Australian households) that would be delivered with paper Census forms, in addition to online access codes, in advance of Census night. A number of these areas were identified due to a high proportion of older residents. The ABS approach ensured that all homes that could not, or did not, either complete online or request a paper form in advance of the Census would be visited by a Census field officer whom would hand deliver a Census form and provide assistance if necessary. The ABS worked with the Department of Health in order to put in place special strategies, including employment of staff, in nursing homes and aged care facilities to provide assistance with the Census form. The special strategies for people with disability, such as large print forms, were also commonly used among older Australians.

APPENDIX 11 - 2011 CENSUS DATA ENHANCEMENT PROJECTS - SUMMARY

	Statistical Initiatives	Status
1	Indigenous Mortality Study (to underpin Life expectancy estimates and Life tables)	Released
2	Australian Census Longitudinal Dataset (ACLD)	Released
3	Australian Census and Migrants Integrated Dataset (ACMID)	Released
4	Vocational Education and Training (VET) in Schools, experimental estimates (2011 Census, 2006 VET)	Released
5	Measuring Educational Outcomes over the Life Course (Census, NAPLAN, Australian Early Development Census (AEDC), school enrolments, and National Early Childhood Education and Care)	Released
	Tasmania	Released
	Queensland	Released
6	Mental Health Services - Census Data Integration Project	Released
7	Australian Early Development Index - Census Data Integration Project	In progress
8	Australian Government's Settlements Database (SDB) and the ACLD	In progress
9	Australian Government's Social Security and Related Information (SSRI) and the ACLD	In progress

	Quality Studies	Status
1	Census to Census Dress Rehearsal (2011 to 2010)	Completed
2	Migrants Quality Study (2011 Census)	Released
3	Education Quality Study (2011 Census)	Released
4	2011 Census Post Enumeration Survey (PES)	Completed
5	ACMID methodology	Completed
6	PES to Medicare Enrolments Database (MEDB) Quality Study	In progress
7	Personal Income Tax (PIT) to Census Data Linkage Project	In progress
8	Multi-Agency Data Integration Project (MADIP) (2011 Census, SSRI, PIT, Medicare)	In progress

APPENDIX 12 - LIST OF CENSUS FREQUENTLY ASKED QUESTIONS AS AT 18 AUGUST 2016⁹

The Census

What is the Census?

The Census of Population and Housing (Census) is Australia's largest statistical collection undertaken by the Australian Bureau of Statistics (ABS). For more than 100 years, the Census has provided a snapshot of Australia, helping to shape our nation's education health, transport and infrastructure.

When is the Census?

The Census of Population and Housing was conducted on Tuesday, 9 August 2016, but there's still time to complete your Census.

What if I was away from home on Census night?

Everyone who was in Australia on Census night needs to participate in the Census, no matter where they stayed. Whether you are an international visitor, travelling to remote areas, simply travelling interstate or staying away from home due to a natural disaster or other reason, arrangements have been made for you to complete the Census.

Staying with family or friends

If you were staying with family or friends on Census night, make sure you are included on their form.

Staying in other accommodation

For those who stayed at an accommodation service such as a hotel, serviced apartment, hostel or caravan park, your accommodation service provider should have given you a form. If you did not receive a form, you will have been captured in the administrative count of that accommodation service provider so no action is required.

Travelling in remote areas

Special Field Officers were stationed at certain locations in remote areas such as truck stops and caravan parks to provide you with a form. If you did not receive a Census form from a dedicated pick-up location, please contact the Census Inquiry Service on 1300 214 531.

Away from home due to natural disaster

In areas that have experienced natural disasters, the Census will count how many people reside in, or intend to return to, the affected areas. Answers to the question about your usual address will provide accurate information about these areas to inform planning decisions and rebuilding efforts.

Overseas on Census night

If you were not in Australia on Census night, you are not required to complete the Census. We use the information collected on overseas departure cards from Australia's ports and airports to add Australian residents back in - you will still be counted.

International visitors

If you were visiting Australia on Census night and are still in Australia, you are required to participate. Your accommodation provider will have given you a form or details of how to complete the Census

⁹ These FAQs are available online at <http://www.abs.gov.au/websitedbs/censushome.nsf/home/faq?opendocument&navpos=110>

online.

Unoccupied dwelling, property or deceased estate

You only need to fill in a form for the residence you stayed at on August 9. You can put the other form or letter for the unoccupied house in the recycling.

At work on Census night - shift work

If you worked on Census night and returned home the next day, you should include the details of your usual household on your Census form. You should complete your form as soon as possible.

Can I still complete the Census?

The Census needs to be completed in relation to Census night, August 9 but it can be completed after this date.

You will not be fined if you complete the Census after August 9.

Is the Census compulsory?

Yes. Everyone in Australia must complete the Census. It's the law.

If I still haven't received my letter or paper form what should I do?

If you haven't received your Census materials, there's still time. You'll soon receive a reminder letter which includes your household's unique Census Login, use it to complete the Census online or follow the directions to order a paper form.

Census Field Officers will also begin visiting households that have not completed the Census to deliver Logins or paper forms, to ensure that everyone can take part.

Once you receive your letter or paper form, please complete it as though it was Census night and return it as soon as possible. You will not be fined for completing the Census after 9 August.

What if I have lost or forgotten my password?

If you have lost or forgotten your password and not completed your Census you will not be able to return to your form. You will need to contact the Census Inquiry Service on 1300 214 531 to request a new Census Login.

I completed my Census form, why have I received a reminder letter from the ABS?

If you have recently completed your Census and received a reminder letter, no further action is required. Thank you for participating in the 2016 Census.

How many people are expected to complete the Census online?

In 2016, more than 15 million people are expected to complete the Census online.

I am receiving an error code 950, 101 or 102, what do I do?

Please use another web browser or device to complete the Census, if available to you. If you do not have the 12 digit Census Login number and 9 character Password, please contact the Census Inquiry Service on 1300 214 531 to receive a new 12 digit Login.

If you do not have another device, you can request a paper form by calling our automated Paper Form Request Service on 1300 820 275.

I have received a paper form, can I complete it online?

In some locations, households will receive a paper form upfront with the option to complete the Census online. If you're able to access the internet, just follow in the simple instructions on the front of the form to complete it online.

If you complete it online, do not mail back your paper form – please recycle.

Will personal information be shared with other government departments?

No. The personal information you provide in the Census is not shared with any other government departments or agencies including the police, Australian Taxation Office or Centrelink.

The ABS is legally bound to protect the privacy of all Australians and will not release your information in a way that will identify any individual or household.

Find out how the ABS upholds the [privacy, security and confidentiality](#) of the information it collects.

What happens to my personal information after the Census?

After data collection and processing, the ABS will remove names and addresses from other personal and household information and will store them separately and securely. Names and addresses will be destroyed four years after collection in August 2020.

Census data

What are Census data items?

A Census data item (or variable) is a characteristic of a data unit which is measured or observed, e.g. country of birth, or income.

Census data items are classified in three groups:

- Person variables
- Family variables
- Dwelling variables

Where can I find definitions of the data items?

Details can be found in the [2011 Census Dictionary](#) (cat. no. 2901.0). To find the definitions for a previous Census, go to [Historical reference & information](#) for links to the relevant Census Dictionary.

What data items are available in 2011 Census data products and where can I find a list of them?

Go to the [Information Paper: Census of Population and Housing – Products and Services, 2011](#) (cat. no. 2011.0.55.001), Appendixes 2 - 9 for a description of the data items (variables) that are available.

What can Census data tell us?

[Analytical articles](#) have been designed to tell users a story for a selected topic.

How accurate are Census data?

Go to the [Data quality](#) page for general information about the accuracy of Census data. As information is released about the quality of 2011 Census data, you will find this information in the [Data quality](#) section of the website. Information about the quality of data from previous Censuses is in the [Historical reference & information](#) page.

APPENDIX 13 - STATEMENTS MADE BY THE AUSTRALIAN PRIVACY FOUNDATION (APF) AND THE ABS RESPONSE

APF concern as stated on APF website ¹⁰	ABS response
Privacy and other risks	
<i>“Retaining name and address changes the nature of the Census, from an anonymous snapshot to a 'longitudinal' identified record”</i>	<p>The ABS is not creating a ‘longitudinal identified record’. After data collection and processing, the ABS removes names and addresses from other personal and household information. Names will be stored separately and securely from address information, which will be stored separately and securely from all other Census data. No one working with Census data will be able to view name or address at the same time as other Census data (such as age, sex, occupation, level of education or income).</p> <p>The ABS will destroy names and addresses when there is no longer any community benefit to their retention or four years after collection (i.e. August 2020), whichever is earliest.</p>
<i>The data you provide to the “Census is to be linked by the ABS with data about you that it acquires from other sources. This would build a far more detailed picture of you than any agency has ever had before”</i>	<p>The ABS is not establishing an identified database about individuals. Census data may be combined with other existing data sets in order to produce more valuable statistics for Australia, but not to provide information about individuals.</p> <p>Using data for statistical purposes means using it to describe characteristics of groups within the population, and relationships that might exist between variables such as social and economic conditions, behaviours and outcomes. Data for statistical purposes cannot be used in a way that has a direct effect on the individual other than in relation to developing statistical insights about groups or patterns. For example, it cannot be used to identify individuals who are, or are not, eligible for services, nor to facilitate services to a particular individual, nor assess compliance with requirements such as the Income Tax Assessment Act.</p> <p>Names and addresses will be stored separately both from each other and any other "content" information such as Census responses. No one inside the ABS will have access to both identifying information and analytical information. No one outside the ABS will have access to identifying information.</p>
<p><i>“Many government agencies will be interested in getting access to the same data as researchers, with the intention of consolidating it with data that they already hold about you.</i></p> <p><i>“While there are at present restraints on this, a future government could decide, at any</i></p>	<p>The ABS cannot, and will not, share or provide identifiable personal information to any government department or organisation. Data collected under the <i>Census and Statistics Act 1905</i> is collected for statistical and research purposes, cannot be shared or provided to any government department or organisation, including the Courts, and cannot be used for compliance purposes.</p> <p>Any lessening of current privacy protections would require changes to the legislation to be approved by both houses of Parliament. A change of this nature would be in clear breach of the United Nations <i>Fundamental Principles of Official Statistics</i>¹¹ and a clear breach of the OECD's legal</p>

¹⁰ <https://www.privacy.org.au/Campaigns/Census2016/>

¹¹ United Nations, ‘Fundamental Principles of Official Statistics’, January 2014, available: <http://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx>

APF concern as stated on APF website¹⁰	ABS response
<i>time, to permit use of your data for further purposes, including data-matching and the administration of taxation, government benefits, etc.”</i>	instrument that Australia has recently approved, the <i>Recommendation on Good Statistical Practice</i> ¹² which state that individual data collected by statistical agencies is strictly confidential and is to be used for statistical purposes only.
<i>“Security can no longer be guaranteed.”</i>	<p>The ABS complies with the mandatory requirements established by the Australian Commonwealth Protective Security Policy Framework, which include implementing governance, physical, and information security measures to protect data held by the ABS.</p> <p>Australian Signals Directorate strategies are implemented by the ABS. These strategies include strategies specifically designed to mitigate targeted cyber intrusions. In addition, the identifying information is stored securely and separately to the content data as an additional layer of protection.</p>
<i>“While the SLK cannot apparently be easily reversed to derive your name and date of birth, from which it is derived, once in place it become a form of virtual identifier, tying you to other data sets.”</i>	<p>The ABS does not create unique, permanent virtual identifiers or use the SLK581 method with Census data.</p> <p>The ABS will be creating anonymised linkage keys on a project-by-project basis to allow Census data to be anonymously and safely connected with other existing datasets by the ABS.</p> <p>The anonymised linkage keys created for each project will only be used and retained as required for the purposes of the project. Access to anonymised linkage keys will be restricted to a very small number of ABS officers, and only while they need access to conduct data linking. These officers, like all ABS officers, have signed a lifetime legal Undertaking of Fidelity and Secrecy.</p>
<i>“Your detailed data will be released to researchers. While it won't explicitly carry your name and address, the data is very detailed, and can potentially be re-identified”</i>	<p>Under the <i>Census and Statistics Act 1905</i>, the ABS cannot and will not release information in a manner that would enable an individual to be identified. The ABS has built up considerable methodological expertise and capability to meet this requirement and manage the safe dissemination of statistical information.</p> <p>A range of procedures and techniques are used to ensure an individuals' identity is protected, including removing identifiable information such as name and address; by controlling and limiting the amount of detail available in datasets released to researchers; by slightly modifying or deleting data from datasets released to researchers where that data may enable identification of individuals or businesses; and by requiring individual researchers and their employing organisations to sign legally enforceable undertakings that restrict how they use the data.</p>
Privacy Impact Assessment	
<i>“The PIA was not conducted by an independent body”</i>	There is no requirement to engage an external consultant to conduct a PIA in the best practice guidelines of the Office of the Australian Information Commission. The ABS sought advice from the Office of the Australian Information Commission on the 2016 PIA, and followed their best practice guidelines issued by that Office.

¹² OECD, 'Recommendation of the Council on Good Statistical Practice', November 2015, available: <http://acts.oecd.org/Instruments/ShowInstrumentView.aspx?InstrumentID=331&InstrumentPID=380&Lang=en&Book=False>

APF concern as stated on APF website¹⁰	ABS response
<p><i>“The consultation process for the PIA was almost non-existent”</i></p>	<p>The proposed changes were an incremental change to existing practice in the widely publicised Census Data Enhancement program undertaken with the 2006 and 2011 Censuses.</p> <p>The ABS invited public comment on the proposal to retain names and addresses from the 2016 Census by issuing a media release inviting comment, and an accompanying statement of intent on 11 November 2015. Direct consultation was undertaken with each State and Territory Privacy Commissioner and the Australian Information Commissioner. More information on the Consultation process is provided in Section 11.2</p>
<p><i>“The PIA failed to adequately address the issues in respect of keeping names and addresses which were identified and raised in the previous PIA in 2005, when a 5% sample was proposed.”</i></p>	<p>The PIA undertaken in 2005 considered a proposal to create a statistical longitudinal census dataset comprising 100% of Census records. The ABS took account of the outcome from the PIA and the public consultation process and decided to link only a 5% sample. The Australian Census Longitudinal Dataset, as it is now called, will continue to take the 5% sample approach.</p>
<p><i>“The PIA does not comply with the Federal Privacy Commissioner’s guidance.”</i></p>	<p>The ABS fully followed the <i>Guide to undertaking privacy impact assessments</i> issued by the Office of the Australian Information Commissioner and sought advice from them during the preparation of the Privacy Impact Assessment.</p>