NSW Government Data Strategy

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NSW
GOVERNMENT

NSW Government Data Strategy

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1.   Introduction

Bushfires, floods, and a pandemic – 2020 was a year of unexpected challenges. We have seen the health, economic and social landscape rapidly change in NSW, requiring NSW Government to think, act and respond differently. Data has been at the heart of our response.

Data has fueled Government decision making. It has helped us to understand how the COVID-19 public health measures have kept the community safe, including identifying and communicating with the community about COVID-19 case locations, testing rates, and which businesses are registered as COVID Safe. From an environmental protection perspective, data has been key to understanding the biodiversity and landscape impacts of bushfires and identifying those communities and businesses most in need of support.

However, this Strategy is broader than natural disasters or a pandemic – it is about using data to drive better outcomes for our customers across all our work, while at the same time, protecting their privacy. We have learned many important lessons in the last 12 months about the value of using and sharing data, and about the importance of maintaining appropriate data governance as we use data ever more widely. Agencies are increasingly sharing data to respond to our most complex problems and develop solutions, and there is a much stronger sense of collaboration across the sector as we monitor developments and respond in real time.

The NSW Government Data Strategy will further develop our maturity in the use of data for better community outcomes. The Strategy focuses on harnessing the power of data to shape our future – to deliver on this Government's priorities, to respond to emerging issues, and most importantly to deliver the experience and services that the people and businesses of NSW have come to expect, while maintaining the privacy, security and ethical standards expected of us.

2. Our Vision

Our vision is for NSW Government to deliver better outcomes for the community by putting data at the heart of decision-making through a collaborative, coordinated, consistent and safe approach to using and sharing data.

This will allow us to:

Accelerate actionable insights that are available to decision makers when they need them. The insights will inform government services, policies and programs and support government decision-making, including in emergency situations, such as natural disasters and public health crises, to deliver better customer experiences and outcomes. We will do this by establishing ways of working that accelerate our ability to safely bring together the right data from trusted sources, generate richer insights more quickly and make them available to decision-makers through self-service and user-friendly data products.

Treat data as an asset, ensuring we understand the data we have and its value, we manage and protect it effectively and that our investment in data across the sector is strategic and coordinated. We will do this by recognising data as a significant state asset in its own right; aligning on standards and practices to promote consistency and increase the visibility, usability and value of data; making better use of data by developing deidentified enduring data assets that bring together data from across government to enable collective problem-solving; and developing a spend category for government procurement of data and data services to ensure expenditure on data is transparent.

Strengthen transparency and trust, ensuring we collect, manage, use and share data in accordance with the highest, privacy, security and ethical standards and we release open data, with appropriate safeguards, to promote transparency of government and provide a platform for innovation. We will do this by protecting our customer's rights, taking a 'by design' approach to data projects by assessing privacy, security, and ethical impacts, and aligning with community expectations and the individual and collective interests of Indigenous peoples. We will also consolidate whole of government data policies to accelerate safe use and sharing of data across government, including engaging with the Aboriginal Community to implement Indigenous Data Sovereignty and Indigenous Data Governance principles.

Foster culture, leadership and capability, ensuring our people understand the importance of using data to inform decisions that impact our community, that they have the skills to use data effectively and safely in their roles, and that we leverage the skills and capabilities of people in specialist data roles effectively. We will do this by fostering strong data leadership through our Chief Data Officers (CDOs) and the NSW Data Leadership Group (NDLG). This will include CDOs leading development of Data Roadmaps for their departments and the NDLG conducting a maturity assessment across the sector to determine baseline data literacy and capability and inform capability building priorities.

3. NSW Data Reform

The NSW Government is embarking on a significant data reform program to advance the way we use and share data to drive better outcomes. The NSW Data Reform involves three overlapping phases. Phase 1 is focused on embedding the data practices that delivered valuable data and insights during COVID-19. This phase is well under way and described further in Appendix A. This Data Strategy forms Phase 2 of the NSW Data Reform and the statutory review of the *Data Sharing (Government Sector) Act 2015* forms Phase 3 (Figure 1).

Phase 1	**Phase 2**	**Phase 3**
Embedding data practices that delivered valuable data and insights during COVID-19 across NSW Government	**NSW Government Data Strategy**	**Statutory review of the NSW *Data Sharing (Government Sector) Act 2015***
Data practices: • Regular cross-sector engagement and collaboration. • Whole of government coordination and sharing of data and insights across government. • Integration of data and insights from agencies and the private sector. • High responsiveness and transparency. • Enabling legislation. • Strong data governance. **Phase 1 actions:** • Appoint Chief Data Officers in each government Department (CDOs) (Completed). • Establish NSW Government Data Leadership Group (NDLG), comprising CDOs (Completed).	• Set a collaborative, coordinated, consistent and safe approach to using and sharing data and insights across government to inform decisions and actions to achieve the best possible outcomes for the people and businesses of NSW. • Applies to NSW Government Departments and Agencies. • CDOs responsible for application of Strategy within their cluster, including development and implementation of Department Data Roadmaps which are high level plans that set out the actions their cluster will take in aligning to the Strategy. • NDLG has oversight of the NSW Government Data Strategy. • Revised annually.	• The Act authorises NSW government sector agencies to share data with other NSW government sector agencies for specific purposes. • The purpose of the review is to determine whether the policy objectives of the Act remain valid and whether the terms of the Act remain appropriate for securing those objectives.

Figure 1: NSW Government Data Reform Phases

4. NSW Government Data Strategy

4.1 Connected Government

The NSW Government Data Strategy sets a collaborative, coordinated, consistent and safe approach to using and sharing data and insights across government to inform decisions and actions to achieve the best possible outcomes for the people and businesses of NSW.

Importantly, the Strategy complements the NSW Beyond Digital Strategy which guides NSW Government to use data and insights to understand our customer's needs and to enhance our services to provide a better and more targeted experience for them in line with our customer commitments. Data is at the heart of key NSW Government strategies and policies, including on Artificial Intelligence (AI), Smart Places, Internet of Things (IoT) and the State Infrastructure Strategy, which states:

"The massive growth in data means that it is becoming a vital infrastructure asset in its own right – one that is critical to developing new innovative services, improving current services and increasing the productivity and performance of assets."

Putting customers at the centre of everything we do requires a connected government where the data and insights we collect and create are used and shared across government, in a manner that is consistent, and compliant with privacy and other legislative requirements and ethical standards. This will advance our capability to deliver on the Premier's Priorities, including being a world-class public service, and the State Outcomes, through enhanced data sharing and use.

The Stronger Communities Data Partnership is an example of the power of strong partnerships between NSW Government agencies, developing the Human Services Data Set as an integrated and enduring state significant data asset for use by NSW government agencies, service providers and researchers to drive better long-term outcomes for vulnerable children and their families.

NSW is playing a key role in hosting a national project team that supports governments across Australia to deliver the pilot project of the National Disability Data Asset (NDDA). The NDDA is bringing together data from across Australia, relating to people with a disability. Developing an unprecedented person-centered and system-wide approach to understanding disability in Australia will facilitate better, more inclusive services and improved life outcomes.

The NSW Government's data-driven response to COVID-19 forged strong collaboration across departments and agencies, supported by a centrally coordinated data program that resulted in unprecedented levels of data sharing across NSW Government as well as with the Australian Government and other jurisdictions, and third parties. This enabled high levels of responsiveness to the information needs of decision-makers and the community.

The adoption of this strategy will build on these successes, harnessing areas within departments and agencies with existing capability and increasing the data maturity of the rest of NSW Government.
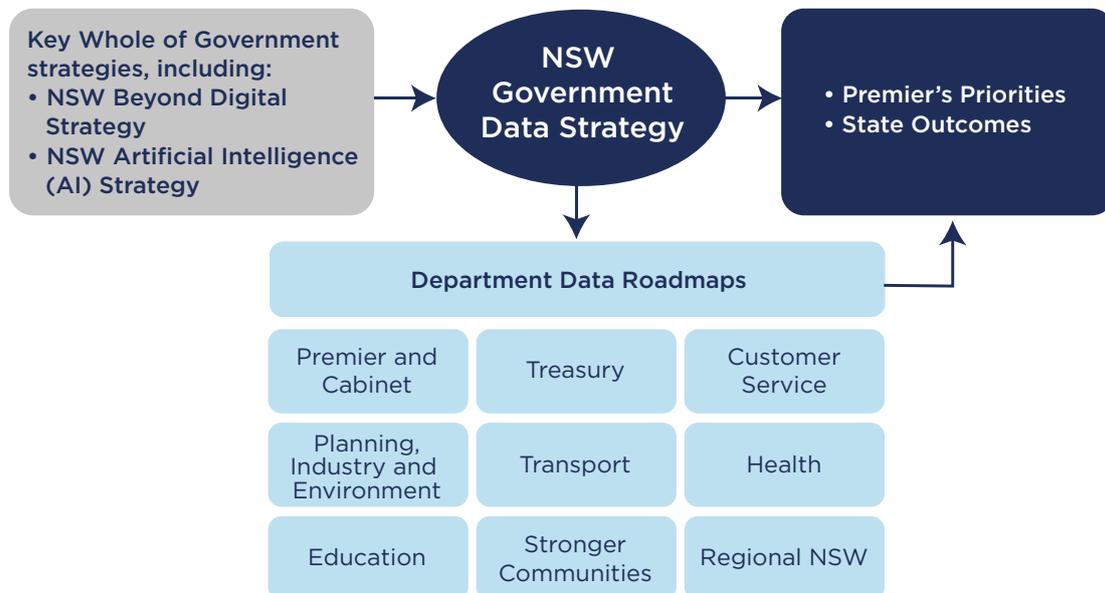
Figure 2: NSW Government Data Strategy Strategic Alignment

The NSW Government Data Strategy applies to all NSW Government departments and agencies.

Chief Data Officers are responsible for ensuring the strategy is applied within their departments and agencies, including by developing and implementing Data Roadmaps which are high level plans that set out the actions and milestones for alignment to the Strategy and their own strategic objectives. The NSW Government Data Leadership Group has oversight of the Strategy.

4.2 Our approach

In developing the Strategy, we talked to data practitioners and senior stakeholders across the government sector and academia about how to rapidly build our data maturity and embed our learnings from responding to bushfires, floods, and COVID-19. Based on the consultation, four themes emerged as key to ensuring the NSW Government is positioned to excel in our use of data, now and into the future.

The NSW Government Data Strategy is comprised of four **Themes**, each of which is underpinned by a set of **Principles** and sector-wide **Actions** associated with that theme. The themes are:

1. **Accelerating actionable insights**
2. **Treating data as an asset**
3. **Strengthening transparency and trust**
4. **Fostering culture, leadership, and capability**

The themes are inter-related and complementary – for instance, a strong data culture promotes the use of actionable insights in decision-making.

Although the Strategy aims to improve the way we use and share data across government, this cannot be achieved without the effective governance and management of data across its lifecycle.

Case studies are used throughout the Strategy to illustrate the themes by reference to current and future data projects and approaches. Additional case studies are provided at Appendix A – Case Studies.

5.   Themes, Principles and Actions

5.1   Accelerating actionable insights

We generate actionable insights and make them available to the people who need them to make decisions.

5.1.1   Why this is important

In a rapidly changing digital age, we must prepare for and adapt to emerging trends, challenges, and opportunities. Our use of data and analytics is evolving, enabling us to rapidly respond to threats and opportunities and identify innovative solutions to complex problems. Achieving a truly data-driven government requires more than just providing data and information to decision makers – it requires us to generate and communicate timely, accurate and relevant insights that decision-makers can act on.

As a government, we need to understand and align strategic priorities with key questions to be addressed and provide the right context to be able to act on insights. This relies on acquiring the right data from trusted sources across government and the non-government and private sectors and making it available for analysis efficiently and safely. For example, the NSW Suicide Monitoring System (Appendix A) which is used to inform local and state suicide prevention initiatives, has dramatically improved the efficiency of reporting on suicides, reducing the time for reporting from a year or more to a number of weeks.

Linking data (by people, business, or place) enables richer insights to be generated more rapidly and enduring deidentified linked data assets to be created for wider and ongoing use. The Pathways of Care Longitudinal Study (Appendix A) links data on children and young people in Out of Home Care (OOHC) from various sources and includes an evidence to action process to determine priorities and actions required to inform policy and practice implementation.

A range of data analytics capabilities support the delivery of insights to decision-makers. For example, the use of advanced data analytics techniques such as machine learning and predictive modelling that provide rich, high quality and targeted insights are being embedded in data practices to accelerate the delivery of insights to decisions makers. Self-service insights hubs provide additional value to users of data, including trend analyses, visualisations, and clearly communicated key messages to inform decisions and actions. An example is the NSW Trend Atlas. Modern, interoperable platforms and tools and automated data management and data analytics processes support accelerated delivery of insights to decision makers.

"There is a distinction between operational data...such as client relational management data or case management data vs data analysed to contribute to studies, to detect trends and develop better joined up services."

- NSW Government Data Strategy Workshop Participant

5.1.2 Principles

- We ensure insights are actionable, by aligning them to strategic priorities aimed at improving community outcomes, providing context, and making them available to decision-makers when they need them.

- We deliver insights to decision-makers through self-service and user-friendly data products and services.

- We accelerate delivery of insights by using modern, interoperable platforms and tools and a range of analytics techniques and by automating data management and data analytics processes wherever possible, and we maintain privacy, security and ethical standards.

5.1.3 Actions

Establish ways of working across NSW Government that reduce duplication, improve efficiency and harness a range of analytics capabilities

Strengthen adoption of sector-wide insights hubs on businesses, customers and places that provide self-service access to data and insights for government decision-makers.

Strengthen adoption of secure analytics workspace capability across the sector to provide safe access to data to government and non-government users to address complex problems of interest to government.

Develop and adopt secure data exchange capability for use across the sector that incorporates privacy-enhancing technologies to enable data discovery and safe data sharing and use.
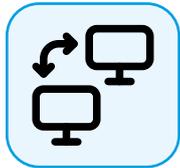
Secure hosting of enduring linked data assets, making richer insights available more rapidly and safely across government

5.1.4 Case Study: New South Wales (NSW) Trend Atlas

The NSW Trend Atlas is an example of a purpose built cross-government resource utilising multiple data sources to provide timely, reusable insights to users across NSW government.

The Department of Premier and Cabinet's foresight team, Shaping Futures, is developing an insight tool for government agencies to better understand the local and global trends most relevant to NSW and to support agencies to navigate future operating environments. The platform will help government agencies:

- evolve their planning practice to be more adaptable and resilient to change and future shocks

- better position and prepare for global and national competition in innovation

- foster collaboration and insight sharing to break down silos between agencies.

The platform will provide access to a diverse set of quantitative and qualitative data from NSW, Australian, and global sources, enriched with insights developed via trend analysis. It will make futures analysis easier to integrate into government decision making, strategic planning, policy development, and service redesign. Drawing on the same insights will also bring greater consistency across different government initiatives and build capability within government.

5.2 Treating data as an asset

We treat data as an asset by identifying the data that matters for delivering better customer outcomes, governing and managing it effectively across the data lifecycle, and using and sharing it across government and as open data to generate insights that support decision-making and innovation.

5.2.1 Why this is important

It is recognised internationally that data use and sharing across government and as open data has positive social and economic benefits for data providers, data users and the wider economy (OECD). Sharing government data can also help to create a fairer and safer society for everyone (ONDC). The NSW State Infrastructure Strategy, 2018-2038 called for data to be treated as an asset in its own right.

The volume, type and complexity of data that NSW government handles is growing rapidly. This is being driven by increasing use of digital channels to provide government services, and initiatives that use technology and data solutions to improve the quality of life for communities in NSW, including smart places and emergency response efforts.

"Real-time data becomes invaluable for decision making during a time of crisis."
– Senior Executive, Department of Premier and Cabinet

Data from outside government is also important for understanding our customers and we collect and procure data from the non-government and private sectors. Where this data is useful across government, we will ensure procurement is streamlined and targeted to reduce duplication and cost.

We are making better use of this data. We are developing deidentified enduring data assets that link together data sets from across NSW government, for example the NSW Human Services Data Set (Appendix A) and the Pathways of Care Longitudinal Study (Appendix A) and, where possible, from other states and territories and the Australian government, for example the National Disability Data Asset, for use by NSW Government agencies, service providers and researchers to address key government priorities that require a cross-sector response.

We also publish over ten thousand government data sets as open data to support government transparency and provide a platform for innovation by government, industry, researchers and the community.

How do we value data?

It is difficult to value data. However, generally, the value of data increases as it moves through the data valuation chain from raw data to actionable insights and actions. (Figure 3)[1]. The products and resources derived from data assets are also valuable assets.


| Data lifecycle | Create, capture, collect | Organise, store | Link | Analyse | Share | Use, reuse | Archive, dispose |
| Valuation chain | Raw data | Processed data | Integrated data | Analysed data | Actionable insights | Action | |
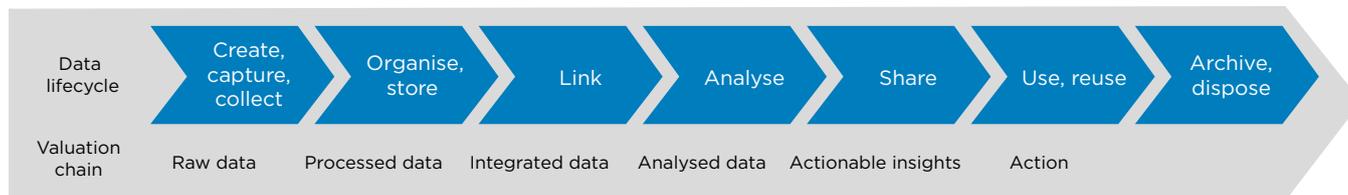
Figure 3: Data management lifecycle and data valuation chain

Managing data effectively across its lifecycle increases its value (Figure 3). This includes ensuring good data quality from the time of data collection, including use of recognised data standards. This facilitates data linkage and data use and sharing; and designing and using systems that ensure security of the data and maintain the privacy of individuals.

The value of data is also increased if it is discoverable and accessible and if it is well-described by metadata. This helps users understand the data so they can trust it and use it appropriately. It is important that any metadata remains with the data if it is shared or published as open data. Correct interpretation of the data is enhanced by collaborating with agencies who understand the context in which the data was collected and any limitations of the data. Systems which store, transform, calculate, or manipulate data must also be well documented. The Department of Planning, Industry and Environment's Information Asset Register (Appendix A) is used to create metadata records, link to corporate data sources and other resources and identify the names of custodians, stewards and creators within the organisation.

Collecting, managing, using, sharing and providing support for interpretation of data requires investment. If data is poorly managed it could become a liability. Minimising ongoing costs of handling and storing data by only collecting the data that is needed and using, reusing, improving and sharing data effectively is important to maintain the value of the data asset.

[1] Adapted from C. Mawer 2015

5.2.2 Principles

- We treat data as an asset and manage and protect it effectively throughout its lifecycle, including managing data quality at source where possible, and using master and metadata standards that facilitate data linkage, use and sharing

- We collect, create or procure data once and use it many times, including through enduring deidentified data linkages, where possible and permitted by law

- We support and promote greater use and availability of data including publishing open data with appropriate safeguards

- We strive to understand return on our data investment.

5.2.3 Actions

Identify data and associated metadata as a significant state asset, acknowledging its value in developing and improving services and the investment required to create and maintain it.

Create and implement a spend category for government procurement of data and data services so expenditure on data is transparent.

Develop guidelines on calculating the cost of managing data and the value created by transforming, using and sharing data.

Where appropriate, support and coordinate sharing of Departmental and Agency data assets identified as being of high value across the sector and the development and ongoing stewardship of enduring deidentified linked data assets to ensure accessibility and enable collective problem-solving.

Where appropriate, procure and share private and non-government sector data and insights identified as being of high value across the sector, leveraging existing Departmental and Agency relationships and domain knowledge, to ensure value for money and accessibility.

5.2.4 Case Study: National Disability Data Asset (NDDA)

The NDDA has been identified as a pilot for significant national and state assets and is being actively managed using secure infrastructure and strong data governance.

The NDDA is bringing together more data from across different governments, relating to people with disability than has been previously shared. It will provide a more complete picture of what it means to live with disability in Australia, to enable improved outcomes for people with disability. Developing an unprecedented deidentified person-centred and system-wide approach to understanding disability in Australia will facilitate better, more inclusive services and improved life outcomes, without identifying individuals or being used for compliance purposes. If established as an enduring asset, it would be Australia's most comprehensive human services data asset.

The NDDA is currently in a pilot phase. NSW is playing a key role by hosting the national project team that supports all governments across Australia to deliver this pilot, as well as contributing significant data and analysis. The pilot involves delivering five cross jurisdictional test cases to use a "try, test and learn" approach to designing all elements of the enduring asset, including legislative mechanisms that enable data sharing and use, governance, operational, technical and shared definitions to be able to identify cohorts within data sets. Platforms are also being developed for safe access to the data asset by a range of users, including decision makers, researchers, service providers and people with disability.

In this pilot phase, data has been successfully linked from six government agencies across NSW and the Commonwealth, and from the National Disability Insurance Scheme (NDIS). This process is being used to identify where policies and processes could be updated and streamlined, and multiple organisations are working collaboratively to workshop these changes. This includes using the lessons of developing the NDDA to test and review changes to Commonwealth data sharing legislation and the *NSW Data Sharing Act*. In harmonising processes, governance frameworks are being developed through community-informed processes that will build trust and provide transparency in the sharing mechanisms.

A NSW-led test case is developing and testing methodology in collaboration with National Partners to establish enduring linkage maps to enable rapid scalable linkages between NSW and the Commonwealth. Furthermore, this methodology reduces the requirement for transferring personal information, making this process intrinsically safer.

The NDDA will pave the way for improving how characteristics of cohorts are captured in datasets, including feeding back information to improve agency data collections. This is particularly key in identifying people with disability more accurately, but similar processes could improve confidence in other markers across datasets, such as language spoken at home or gender.

Intake Data	Integrate Data	Enhance Data	Analyse Data	Share Insights	Take Action

Data improvement
Secure
Engage
Govern
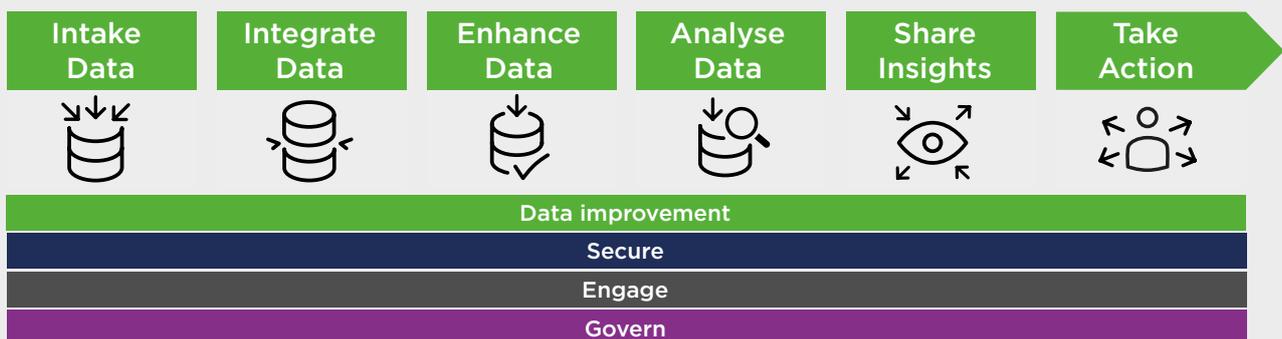
5.3   Strengthening transparency and trust

We cultivate trust in the way we collect, manage, use and share data. This means that how we handle and safeguard data is governed by clear and consistent guidelines which are available to the public, and protective of customers' rights, including their privacy and information access rights. We acknowledge and respect Indigenous Data Sovereignty – the right of Indigenous peoples to govern the creation, collection, ownership and application of their data.

5.3.1   Why this is important

As government, we hold large amounts of data about the people and businesses of NSW. As we become more digitally enabled, the volume of data we hold continues to grow and we recognise that with this, the cybersecurity and privacy risks increase. Using and sharing this data enhances our ability to understand our customers, and make decisions to inform and evaluate services, policies and programs and to optimise customer experiences and outcomes. Releasing government data as open data, with appropriate safeguards, promotes transparency of government and provides a platform for innovation. In achieving these benefits, we have a stewardship responsibility to ensure that we collect, manage, use and share data safely, in accordance with the highest privacy, security and ethical standards and in line with community expectations and the individual and collective interests of Indigenous peoples.

Fostering trust

Fostering trust involves considering community expectations and respecting our customers' preferences for how we engage with them and collect, manage, use and share their data. Applying the NSW Government Customer Commitments and the now Australian Digital and Data Ministers' Meeting Trust Principles in the delivery of data and digital projects will support us in achieving this trust. These principles include respect, accountability, security, privacy and transparency.

Effective data governance

Trust and transparency are also supported by effective data governance and data management practices. This ensures transparency - data is discoverable and accessible and trusted – data is of high quality and consistency, secure, and individuals' privacy is protected. NSW Service Point (Appendix A) provides an example of taking a 'privacy by design' approach to collecting and storing standardised information about government transactions to support service delivery.

Guidance on data governance is provided in the Data Governance Toolkit and in a range of other NSW Government data policies, guidance and frameworks, including on data sharing and information management. These will be consolidated to provide greater consistency and transparency about how we govern data use and sharing across NSW government. The data sharing guidance will be updated to align with the Australian Government data sharing scheme as appropriate.

Facilitating Indigenous Data Sovereignty and Indigenous Data Governance

Indigenous data is information or knowledge, in any format or medium, which is about and may affect Indigenous peoples both collectively and individually.

Indigenous Data Sovereignty is a global movement concerned with the right of Indigenous peoples to govern the creation, collection, ownership and application of their data. Indigenous Data Governance is the right of Indigenous peoples to autonomously decide what, how and why Indigenous Data are collected, accessed and used. It ensures that data on or about Indigenous peoples reflects their priorities, values, cultures, worldviews and diversity.

Indigenous peoples have the right to exercise control of data which is about and may affect them both collectively and individually, including control of data creation, development, stewardship, analysis, dissemination and infrastructure.

Indigenous peoples have the right to have data that is contextual and disaggregated, that is protective and respects their individual and collective interests and that is relevant and empowers sustainable self-determination and self-governance. They have the right to have data structures that are accountable to them.

Legal and policy context

As we increasingly use digital channels, it is more important than ever that we have the right data protections in place to enable us to make more widespread use of this data. Requirements for protecting security, privacy and access rights in governing and managing our customers' data are set out in NSW legislation and policy.

We comply with the NSW Cyber Security Policy, including classifying and handling data in accordance with the NSW Government Information, Classification, Labelling and Handing Guidelines.

We use and share de-identified data wherever possible and we comply with the *Privacy and Personal Information Protection Act 1998* and the *Health Records and Information Privacy Act 2002* if personal or health information is involved. We are developing and using Privacy Enhancing Technologies (PETs), such as the Personal Information Factor (PIF) tool, so we can use and share data safely. We also have data breach management plans and notify serious data breaches to the NSW Privacy Commissioner.

We respect our legislated obligations for transparency under the *Government Information (Public Access) Act 2009*, including with respect to government decision-making and we release government data as open data in accordance with the NSW Open Data Policy. We also comply with the *State Records Act 1998* for the creation, capture, control, use, maintenance and disposal of all records.

The Data Sharing (Government Access) Act 2015 authorises NSW Government sector agencies to share data with other NSW Government sector agencies for specific purposes. The Act was world leading when it was instituted but has now been overtaken by advances in this area in other jurisdictions. A statutory review of the Act is being undertaken as Phase 3 of the NSW Data Reform.

Data ethics

Trust and transparency are also fostered by ensuring we consider ethical impacts in collecting, managing, using and sharing data and in our decision-making, especially when vulnerable members of our community are involved. Many parts of NSW government are already working in accordance with research ethics frameworks. In addition, the NSW Artificial Intelligence (AI) Strategy's AI Ethics Policy outlines mandatory ethical principles for the use of AI by NSW Government agencies. These are aimed at ensuring that AI solutions used by government are trusted by the public, meet the highest ethical and assurance standards, are clearly focused on customer needs, and carefully manage potential risks.

Having a review mechanism where citizens can question and challenge AI based outcomes is key to transparent use of AI. This might include sharing and publishing methodologies, algorithms and models we use to generate insights and inform decisions so we can explain our decisions when asked. The principles outlined in the AI Ethics Framework are also important more broadly and we will draw on them in developing a clear set of Data Ethics principles for NSW Government.

5.3.2 Principles

- We respect customers' preferences about how we engage with them and collect, use and share their data.

- We take a 'by design' approach to data projects and assess privacy, security and ethical impacts across the data lifecycle ensuring controls are proportionate to the risks and that we consider community expectations and Indigenous Data Sovereignty and comply with relevant legislation and NSW government policy.

- We work with the Aboriginal Community of NSW on all aspects of the Data Strategy to embed principles of Indigenous Data Sovereignty and Indigenous Data Governance.

- We recognise Aboriginal community members for their expertise as part of the Data Strategy and we involve them in its governance.

- We empower our staff to increase their knowledge and skills in the emerging areas of capability needed to effectively design, develop, implement and evaluate Indigenous Data Sovereignty and Indigenous Data Governance.

- We ensure data quality is fit for purpose and understood and we provide metadata to facilitate data discovery and accessibility and so the data can be trusted and used appropriately.

- We cultivate a culture of trust between data providers and recipients, including Aboriginal people, through consistent and safe data sharing practices and effective data governance and stewardship.

- We encourage sharing and publication of methodologies, algorithms and models to increase transparency and build trust in our decision-making.

5.3.3 Actions

Undertake statutory review of the *Data Sharing (Government Sector) Act 2015* (NSW).

Engage with the Aboriginal Community to gain an understanding of the peoples that wish to participate in community engagement about the Indigenous Data Sovereignty and Indigenous Data Governance reforms included in the Data Strategy.

Consolidate whole of NSW Government data policy, including developing a common data sharing agreement and streamlined approval process across government, aligning with the Australian Government's data sharing scheme as appropriate; and working with the Aboriginal Community to ensure inclusion of Indigenous Data Sovereignty and Indigenous Data Governance principles.

Work with the Aboriginal Community to implement and evaluate the Indigenous Data Sovereignty and Indigenous Data Governance principles in the Data Strategy and in the consolidated whole of NSW Government data policy, including for data sharing.

Develop a clear set of data ethics principles for NSW Government, drawing on the ethical principles outlined in the NSW Artificial Intelligence (AI) Ethics Policy (Community benefit, Fairness, Privacy and Security, Transparency and Accountability) and complementing existing research ethics frameworks in use by agencies.

Foster increased release of open data across government, with appropriate safeguards to promote government transparency and provide a platform for innovation.

5.3.4 Case Study: Personal Information Factor (PIF) tool

The Personal Information Factor (PIF) tool has been used by the Data Analytics Centre (DAC) to assess re-identification risk, ensuring that COVID-19 cases and tests data can be safely published as open data.

The DAC has played an important role in supporting the NSW Government's COVID-19 pandemic response efforts in collaboration with the other clusters. De-identified data on COVID-19 cases and tests by postcode, age group and likely source of infection was provided to DAC by the Ministry of Health. This data was released as open data on Data.NSW. This provided transparency and helped inform the community about the impact of COVID-19 as the situation evolved.

Although the data provided by NSW Health was de-identified, there remained a small risk that an individual could be re-identifiable in the data. The DAC assessed the risk of re-identification using the Personal Information Factor (PIF) tool, which was developed as a collaborative effort with State governments, Commonwealth agencies, research organisations and the private sector, led by the NSW Chief Data Scientist. Further information is available in the ACS Privacy-preserving data sharing frameworks report.

The PIF tool is used to assess the risk of identifying an individual in a dataset and provides a measure of the information that could be gained about them by accessing the dataset. Based on this information, decisions can be made with respect to aggregating or suppressing information to reduce the risk of re-identification while maintaining the utility of the dataset. For example, the data on COVID-19 cases was split into four tables and data for certain cases was suppressed before being released as open data. Used in conjunction with an assessment of the sensitivity of the data, the PIF tool can assist in determining the appropriate governance model to be applied to the data. The higher the sensitivity of the data (and the higher the PIF score), the higher the level of trust required. High trust environments demand stronger data governance. However, high sensitivity data that undergoes transformation to reduce the PIF score may be able to be released into a low trust environment, for example as open data.
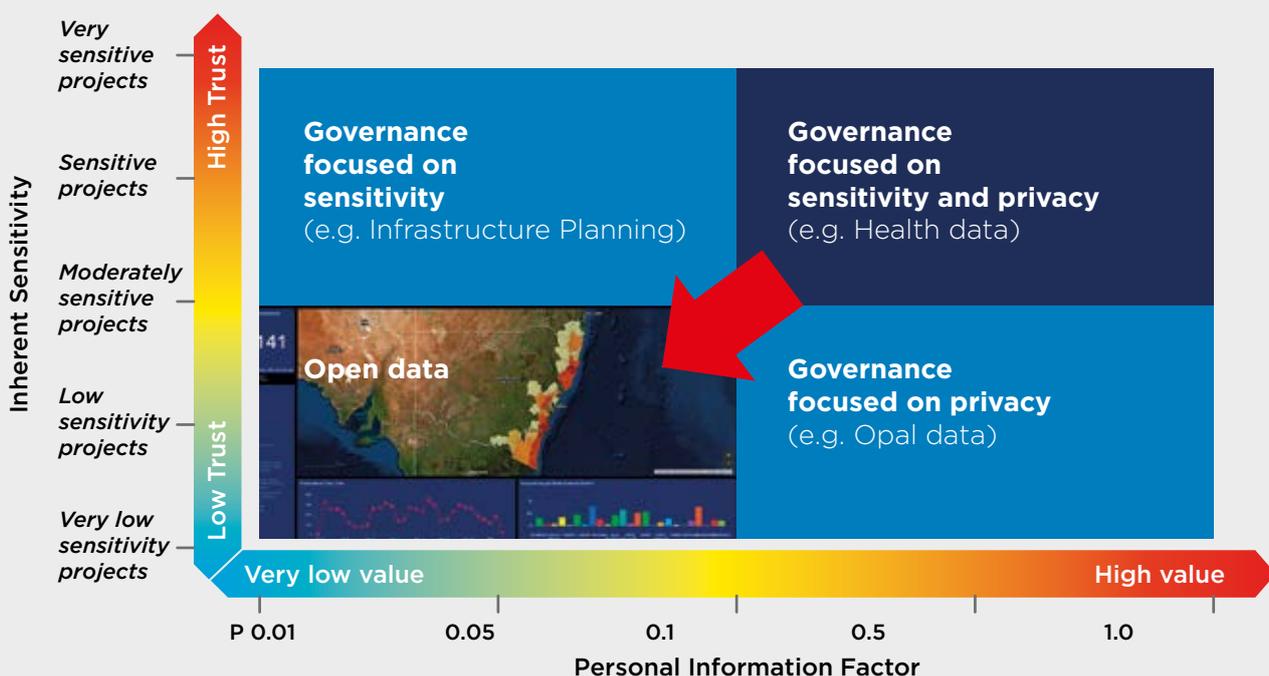
5.4 Fostering culture, leadership and capability

We foster a culture of data-driven decision-making through strong leadership and capability. Our people understand the importance of data and are equipped with the right skills to use it effectively.

5.4.1 Why this is important

Achieving better outcomes and experiences for our customers, requires the design, delivery and evaluation of the policies, programs and services we provide to be evidence-based. A data-driven culture is one in which data is used to inform the decisions that deliver these outcomes. It consists of both the intention (i.e. 'will') to use data in decision-making as well as the capability (i.e. 'skill') to do it.

A strong data culture is achieved when senior executive leaders play an active role in championing the value of data as a strategic asset and ensure that decision-making is informed by data. An example of this in action is the recommendations of the review of water data conducted by the NSW Chief Scientist and Engineer.

To support a strong data culture across the sector, each cluster of NSW Government departments and agencies has appointed a Chief Data Officer (CDO). We have established the NSW Data Leadership Group to lead cross-sector collaboration and drive uplift in capability in the use and sharing of data for improved decision-making and release of open data to foster government transparency and innovation. The CDOs will develop a clear departmental and agency Data Roadmap to facilitate data use and sharing across government and align with the NSW Government Data Strategy.

Our Data Champions Network will continue to bring together data experts and enthusiasts from across NSW Government to share their data experiences and learning and showcase data initiatives and relevant resources.

A data-led culture also requires that all staff, regardless of their role, are data literate and that the skills and capabilities of staff in specialist data roles are maintained and they proactively apply data to business outcomes. To build data literacy and capability, we first need to understand our current state. We will conduct a Data Maturity assessment across NSW government to determine baseline data literacy and capability and inform capability building priorities. This will include definition of data roles and responsibilities. NSW Health is developing a data literacy capability framework (Appendix A) to enable better decisions, improve use of data, enhance capability and strengthen data culture.

Making data available to decision-makers is also a key part of creating a data-driven culture. The theme "Accelerating actionable insights" provides more information.


"We need to improve data use across NSW Government to inform decisions."
- NSW Government Data Strategy Workshop Participant

5.4.2 Principles

- We foster a strong data culture across NSW Government through our senior leaders.

- We value and understand data and ensure it is available to, and used by, staff at all levels across government to inform decision-making.

- We equip and empower our staff with the data skills and capability needed to perform their role effectively and use data safely.

5.4.3 Actions
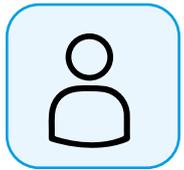
Appoint a member of the senior executive from each Department as the Chief Data Officer to lead and champion data use and sharing across NSW Government.

Establish the NSW Data Leadership Group to drive the data agenda across NSW Government.

Develop Data Roadmaps - high level plans that set out the actions and milestones for each department and agency to align with the NSW Government Data Strategy and their own strategic objectives.

Assess data maturity across NSW Government to determine baseline data capability and inform capability building priorities, including defining data roles and responsibilities.

5.4.4 Case Study: Water Data

Department of Planning, Industry and Environment (DPIE) fostered culture, leadership and capability by developing policies and clear lines for leadership and accountability for water data.

In September 2019, the Minister for Water, Property and Housing, The Hon. Melinda Pavey MP, requested that the NSW Chief Scientist and Engineer review and advise on the adequacy of water-related data collections, infrastructure and capabilities to meet current and future requirements and manage associated risks.

The review identified the need for a comprehensive, integrated, open and whole-of-system approach to deliver useable and high-quality data. Three recommendations were made:

1. The default position of all NSW water data, collected from both public and private sources, should be 'open data' that is publicly available and managed in accordance with the NSW Information Management Framework and relevant standards

2. A Water Data Custodian is appointed to ensure a 'whole of system' and integrated approach is taken to water data. This role should have a reporting line to the CEO Water to provide a degree of authority over data and

3. Consistent with good practice, the roles of data collection and data analysis should, as far as reasonably possible, be functionally separated to ensure decision-making is as objective as possible.

Implementation is progressing, including proactive publication of additional datasets, and the appointment of a Chief Knowledge Officer who takes on the role of the Water Data Custodian, reporting to the CEO Water.

6. Next steps

Our approach to delivering on the Strategy is an iterative one. The Strategy will be reviewed annually to ensure we are well positioned to take advantage of emerging opportunities in data and technology and our increasing data maturity. The actions presented in the Strategy are for the first 12 months and we will monitor our progress on the actions and build on them in the future.

We will monitor progress on:

- Delivery of the sector-wide actions outlined in this Strategy

- Development and implementation of Department and Agency Data Roadmaps

- Identification and prioritisation of data sets considered to be of high value across the sector

- Sharing and sourcing of priority data sets identified as being of high value across the sector

- The effectiveness of the NSW Data Leadership Group as a forum for collaboration on initiatives requiring cross-sector data sharing to achieve shared outcomes.

As new case studies are identified, they will be incorporated into the online version of the Strategy.

Glossary

Term	Definition
Agency	A Public Service agency as defined by the GSE Act – see also Schedule 1 of the GSE Act.
Cluster	The nine groups into which NSW Government departments, agencies, and state owned corporations are organised to enhance coordination and provision of related services and policy development (This reflects the Machinery of Government changes effective 1st July 2019).
Cluster Data Roadmap	High level plans that set out the actions and milestones for each department and agency to align with the NSW Government Data Strategy and their own strategic objectives.
Customer	A customer of NSW Government is anyone who lives, works, visits or invests in NSW. Customers include people and businesses who want to or are required to interact with Government, including people serving custodial sentences. The principles of customer service can be applied in the regulatory environment.
Data	Data is a broad term, the definition of which is heavily impacted by context. Data generally refers to facts and figures that can be represented as numbers, text, graphics, sound or video, as well as how these are interpreted. Data can also take different forms e.g. digital, and can pertain to a range of topics or areas e.g. people, systems and the environment. Data can further be broken down by type or purpose, for example transactional and operational data.
Data asset	A data asset is a structured collection of data developed for a broad purpose. An enduring data asset (or enduring linked data asset) is a subset of this category, denoting the linkage of a larger range of data that is designed for potentially many purposes and users. An example of this is the NSW Human Services Data Set. A data asset could also include models, methodologies and algorithms.
Data ethics	An evaluation of data practices with the potential to adversely impact on people and society – in collection, sharing and use.
Data set (or dataset)	A dataset is an identifiable collection of government-held information or data and associated metadata.
Data sharing	The exchange of data between entities. Restrictions and controls imposed are contingent upon the data's sensitivity and privacy impact.
De-identified data	Data that no longer contains, or never included, identifiers about a person, such that their identity is no longer apparent or reasonably ascertainable from the data. Re-identification also needs to be either impossible, or extremely difficult (adapted from the IPC).

Term	Definition

Health information	As defined in section 6 of the *Health Records and Information Privacy Act 2002* (NSW) (HRIP Act):
	
	(a) personal information that is information or an opinion about—
	
	    (i) the physical or mental health or a disability (at any time) of an individual, or
	
	    (ii) an individual's express wishes about the future provision of health services to him or her, or
	
	    (iii) a health service provided, or to be provided, to an individual, or
	
	(b) other personal information collected to provide, or in providing, a health service, or
	
	(c) other personal information about an individual collected in connection with the donation, or intended donation, of an individual's body parts, organs or body substances, or
	
	(d) other personal information that is genetic information about an individual arising from a health service provided to the individual in a form that is or could be predictive of the health (at any time) of the individual or of a genetic relative of the individual, or
	
	(e) healthcare identifiers,
	
	but does not include health information, or a class of health information or health information contained in a class of documents, that is prescribed as exempt health information for the purposes of this Act generally or for the purposes of specified provisions of this Act.

Indigenous data	Indigenous data is information or knowledge, in any format or medium, which is about and may affect Indigenous peoples both collectively and individually.
Indigenous data governance	Indigenous Data Governance is the right of Indigenous peoples to autonomously decide what, how and why Indigenous Data are collected, accessed and used. It ensures that data on or about Indigenous peoples reflects their priorities, values, cultures, worldviews and diversity.
Indigenous data sovereignty	Indigenous Data Sovereignty is a global movement concerned with the right of Indigenous peoples to govern the creation, collection, ownership and application of their data.
Insights	Meaningful and actionable findings emerging from processed data, that can be leveraged to optimise decision-making processes.

Term	Definition
Internet of Things (IoT)	The Internet of Things (IoT) refers to physical devices that are connected to the internet, collecting and sharing data. It is the global network of infrastructure, vehicles, wearable devices, home appliances, medical technologies and other objects that are embedded with electronics, software, sensors and actuators, enabling these 'things' to share and exchange data to perform their functions more efficiently and effectively (from NSW IoT Policy Guidance, p.1).
Life cycle	A data life cycle illustrates the stages of data management required over time, from the time of planning and creation to the time that data is either archived or destroyed.
Master data	Master data (or reference data) refers to the consistent set of identifiers and attributes that an organisation relies on to provide context for business transactions (e.g., information on customers, employees, locations, products and services).
Metadata	Data or information that describes, defines and adds meaning to other data, to support its interpretation.
Open data	Data is open to the extent that its management, release and characteristics meet the following principles of openness, outlined in the NSW Government Open Data Policy: • Open by default, protected where required • Prioritised, discoverable and usable • Primary and timely • Well managed, trusted and authoritative • Free where appropriate • Subject to public input. Open data should be both technically available and usable, and have licensing frameworks in place to facilitate its release and use.
Personal information	Information or an opinion (including information or an opinion forming part of a database and whether or not recorded in a material form) about an individual whose identity is apparent or can reasonably be ascertained from the information or opinion (*Privacy and Personal Information Protection Act 1998* (NSW) (PPIP Act), section 4).
Personal Information Factor (PIF) tool	The PIF tool is used to assess the risk of identifying an individual if they are not known to be in the datasets. If an individual is known to be in a dataset, the PIF tool provides a measure of the information that could be gained about them by accessing the dataset. The PIF outputs a score showing the distribution of 'Row Information Gain' (RIG) values for records in the data set. The highest value RIG defines the PIF for the data set.
Platform	A system or group of technologies.

Sensitive data or information	Per the NSW Government Information Classification, Labelling and Handling Guidelines (2020), sensitive information includes: • personal information • health information • information which could be subject to legal privilege • commercial-in-confidence information • law enforcement information • NSW Cabinet information.
Spend category	A spend category is the logical grouping of similar expenditure items or services that have been clearly defined on an organisational level. For example, "information technology" may be considered a spend category covering both IT software and hardware.

Case Studies

7.   Appendix A – Case Studies

7.1   NSW Data Reform

7.1.1   Case Study: NSW Data Reform Phase 1: Embedding data practices from COVID-19

The value of using and sharing data and insights to achieve better outcomes for the community has been confirmed by the success of the NSW Government's response to COVID-19. The pandemic required a rapid and data-driven response by NSW Government to the significant health, social and economic impacts. Key success factors included:

- **Regular cross-sector engagement and collaboration** by senior data and analytics representatives from cluster agencies, united in their response to COVID-19 by regularly sharing information on key data initiatives and collaborating on initiatives that required a cross-sector approach

- **Whole of government coordination and sharing of data and insights across government** at unprecedented levels, enabling more rapid access to data and insights to inform health modelling and analysis of the social and economic impacts of COVID-19 and reduced duplication of effort and costs associated with acquiring and procuring data

- **Integration of data and insights from agencies and the private sector** into a single secure portal to form a whole of government view of the impact of COVID-19 and provide shared insights to decision-makers across government and to cabinet

- **High responsiveness and transparency** through daily public reporting of cases, tests and other insights to provide the information needed by the public to understand the ever-changing situation in their local community, encouraging positive behaviour changes to reduce the spread of the virus

- **Enabling legislation** through a public health order authorising the exchange of information between government sector agencies or Ministers, including from the Australian Government or another State or Territory for the purposes of protecting the health or welfare of members of the public during the COVID-19 pandemic

- **Strong data governance practices**, including secure transmission and storage of data, data sharing agreements and cataloguing of shared data and insights, management and monitoring of user access, and use of privacy enhancing technology to assess privacy risks before releasing open data.

7.2 Accelerating actionable insights

7.2.1 Case Study: NSW Suicide Monitoring System

In 2020, the NSW Ministry of Health, Department of Communities and Justice and NSW Police, in consultation with the NSW State Coroner, partnered together to develop the NSW Suicide Monitoring System. The system estimates the number of suspected and confirmed suicides in NSW, the aim of which is to facilitate the timely reporting of suicides and better inform local and state suicide prevention initiatives. It is one of the 15 initiatives of the Towards Zero Suicides Premier's Priority.

The data to estimate the number of suicides comes from information collected by the Police when initially reporting the death to the Coroner. These Police notifications of suspected suicides are obtained from the "JusticeLink" court case management system managed by NSW Department of Communities and Justice. As well as the initial Police advice, records are searched for potential indicators of suicide in other fields. These include the manner or place of death, and whether the person communicated their intention to family and friends. Each potential suicide death record is then screened manually by the Department of Communities and Justice to confirm the classification of suspected or confirmed suicide.

The Suicide Monitoring System was launched by the Attorney General, Minister for Mental Health and State Coroner on 9 November 2020. A monthly report is produced and published on the NSW Health website. The report includes a breakdown of suicides by age, gender, and geography. Further reporting will be developed as additional data items are added to the system.

As NSW Health analyses more real-time data and works to develop an enhanced data set (including more information about key groups), the NSW Suicide Monitoring System will provide authoritative and accessible information to government agencies to respond to suicide in a timely and coordinated way.

Prior to the establishment of the Suicide Monitoring System, NSW relied on the Australian Bureau of Statistics Causes of Death data for information about the number of suicides in NSW. The ABS data has a delay of approximately 12 to 18 months between the death occurring and reporting being available to NSW. The Suicide Monitoring System closes this gap to weeks.

Initial reporting comparing 2019 to 2020 shows that there has not been an increase in the number of people who are suspected to have died by suicide in 2020 despite the many challenges faced during the year by the people of NSW.

The Suicide Monitoring System is hosted and administered by the Ministry of Health. The sharing of data is supported through a formal agreement between NSW Health and the Department of Communities and Justice.

The system feeds data to the Australian Institute of Health and Welfare to support National Cabinet and the Australian Suicide and Self Harm Monitoring System.

The Ministry of Health, Department of Communities and Justice, the State Coroner and NSW Police will continue to work together to expand the data contained in the monitoring system. Linkage to other government datasets including Health is planned in the coming months and years.

7.2.2 Case Study: Pathways of Care Longitudinal Study (POCLS)

The Pathways of Care Longitudinal Study (POCLS) is funded and managed by FACS Insights, Analysis and Research (FACSIAR) within the NSW Department of Communities and Justice (DCJ). It is the first large-scale prospective longitudinal study of children and young people in out-of-home care (OOHC) in Australia. Information on safety, permanency and wellbeing is being collected from various sources. The child developmental domains of interest are physical health, socio-emotional wellbeing and cognitive/learning ability.

The overall aim of this study is to collect detailed information about the life course development of children who enter OOHC for the first time and the factors that influence their development.

The following processes aim to build a collaborative approach and stakeholder buy-in to accelerate actionable insights:

- To ensure alignment with OOHC's most pressing challenges and priorities, regular consultations take place with OOHC stakeholders through the POCLS Study Working Group, POCLS Advisory Group, POCLS Evidence to Action Working Group and DCJ operations and policy executive committees

- Once priority data analysis topics are decided, analysts work closely with the data manager, policy and practice colleagues to ensure the project scope is feasible and answers the policy and practice questions. Ongoing consultation during the analysis process ensures the data is interpreted accurately

- FACSIAR implements a rigorous quality assurance and review process to ensure the POCLS evidence is robust and of high quality

- FACSIAR work alongside the authors of reports to draft Evidence to Action Notes which draw out the main policy and practice insights

- A POCLS Evidence to Action Working Group has been established to draft recommendations to inform systems, policy development, practice innovation and service delivery. The membership are subject matter experts from OOHC policy, Aboriginal Outcomes, Office of the Senior Practitioner (responsible for practice in DCJ), Districts and relevant peak organisations. Consultation with children, parent and carer reference groups will also occur where relevant

- Relevant executive committees are briefed to determine action required and monitor policy or practice implementation

- The DCJ Executive Board is briefed bi-annually on the POCLS progress

- The POCLS Evidence to Action notes form part of the ongoing POCLS publication series and will be available at https://www.facs.nsw.gov.au/resources/research/pathways-of-care.

Figure: Pathways of Care Longitudinal Study process to ensure research is policy and practice relevant

The cycle contains the following stages:

1. Stakeholder consultation on policy questions
2. Identify priority projects
3. Undertake analysis on priority projects
4. Evidence to action work with key stakeholders
5. Implementation and monitoring policy and practice improvements

7.2.3 Case Study: HealthStats NSW

HealthStats NSW is an interactive and user-friendly website which compiles data from multiple sources, and allows users to access and download data, as well as create tailored reports about the health of the New South Wales population. HealthStats NSW is highly flexible and caters to a broad range of users with different needs.

Data on HealthStats NSW is easily accessible and can be searched by keyword or topic. Users can also search the data by location, namely Local Health District, Local Government Area or Primary Health Network.

Topics are further subdivided into groups, allowing users to drill down into specific conditions or diseases, and explore the data for different segments of the population. Users can view trends by criteria such as age, gender, socioeconomic status, year, rurality and location. The most popular topics include obesity, smoking, alcohol, Aboriginal health and immunisation. HealthStats NSW has 1200 active users per week with over 100 pages viewed per working hour.

The data on HealthStats NSW is also available in a range of formats to suit different needs. For each topic or indicator, users have the option of downloading a simple or advanced spreadsheet, as well as the data table, the graph image and documents containing additional information.

Through the "My Report" feature, users can generate and download customised printable reports using data from multiple indicators. Users are also able to access and download a number of standard reports and publications.

Sources: https://www.health.nsw.gov.au/hsnsw/Publications/healthstats-nsw-brochure.pdf; http://www.healthstats.nsw.gov.au/ContentText/Display/About

7.2.4 Case Study: Domestic violence mobile application for police

Domestic violence (DV) is one of the most important public health problems with economic and heath burdens on community populations. In Australia, the annual burden against women (and their children) is estimated to be $AUD22.2 billion. In 2016 the NSWPF worked in collaboration with the Kirby Institute of the University of NSW (Kirby) under ethics approval from the University of New South Wales Human Research Ethics Committee (reference: HC16558). Kirby was provided with 492,393 Domestic Violence events from the Computerised Operational Policing System between 2005 to 2016 to explore whether text mining can automatically identify mental health disorders from unstructured text in COPS event narratives to support further public health research into the nexus between mental health disorders and DV. The extracted mentions of mental health conditions were mapped to the International Classification of Diseases, Tenth Revision (ICD-10) and in their paper published in the Journal of medical internet research in 2018 they identified 77,995 events (15.83%) that mentioned mental health disorders, with 76.96% (60,032/77,995) of those linked to offenders versus 16.47% (12,852/77,995) for the victims and 6.55% (5111/77,995) for both. Depression was the most common mental health disorder mentioned in both victims (22.25%, 3269) and offenders (18.70%, 8944), followed by alcohol abuse for persons of interest (12.19%, 5829) and various anxiety disorders (e.g., panic disorder, generalized anxiety disorder) for victims (11.66%, 1714).

In 2019 the NSWPF worked with Kirby and IBM to develop the research and findings into a mobile application for front line police to assist them in identified persons at risk in domestic violence situations, how to better communicate with those suffering from certain mental illnesses such as schizophrenia, bipolar and depression to de-escalate potential violent behaviour for better community outcomes. This application is due for use by front line police in 2021.

Source: Karystianis G, Adily A, Schofield P, Knight L, Galdon C, Greenberg D, Jorm L, Nenadic G, Butler T. Automatic extraction of mental health disorders from domestic violence police narratives: text mining study. Journal of medical internet research. 2018 Sep;20(9).

7.3 Treating data as an asset

7.3.1 Case Study: NSW Human Services Dataset

In 2018, the Department of Communities and Justice (DCJ) delivered the first comprehensive human services cross-agency dataset in NSW, a major milestone in NSW data integration work. The Human Services Dataset was designed to help government agencies understand and predict future demand for services, make evidence-based investment decisions, and develop coordinated cross-agency interventions that improve outcomes for vulnerable children and families.

The dataset, which was brought about by generous co-operation and collaboration between numerous Government agencies, is unprecedented in scale, bringing together 27 years of data, over 7 million records, from over 60 frontline datasets in 11 government agencies.

To date, information from the dataset has enabled detailed planning into what investment and resources are needed, and where effort should be prioritised, to support vulnerable cohorts. Under the Their Futures Matter initiative, information from the dataset revealed many powerful insights never before quantified in NSW, including:

- Welfare is the largest component of future support cost (56%), followed by health services (25%) and justice costs (8%)

- Services used up to age 40 by the study population (representing NSW children and young people under 25 as at 30 June 2017) are forecast to cost the NSW and Commonwealth governments $428 billion

- Risk factors (for example, 'parent has interacted with the justice system' or 'mother smoked during pregnancy') can be used to project social outcomes and future support costs – groups with a higher number of risk factors project to higher future service costs and poorer social outcomes.

These findings, among many others, have provided an evidence base to compare and contrast the experiences of different cohorts, to better understand what works, for whom, in what circumstances, and ultimately to support the development of better government services to help vulnerable children and families.

In 2020 the NSW Data Analytics Centre (DAC) commenced hosting and management of the NSW Human Services Dataset. The transfer of the dataset to the DAC is a critical first step in maximising safe use of the asset by a broader range of approved government and non-government users and fulfils a primary aim of the NSW Government to consolidate state-significant data assets under a whole-of-government model.

Source: Their Futures Matter, 'How the Investment approach works'
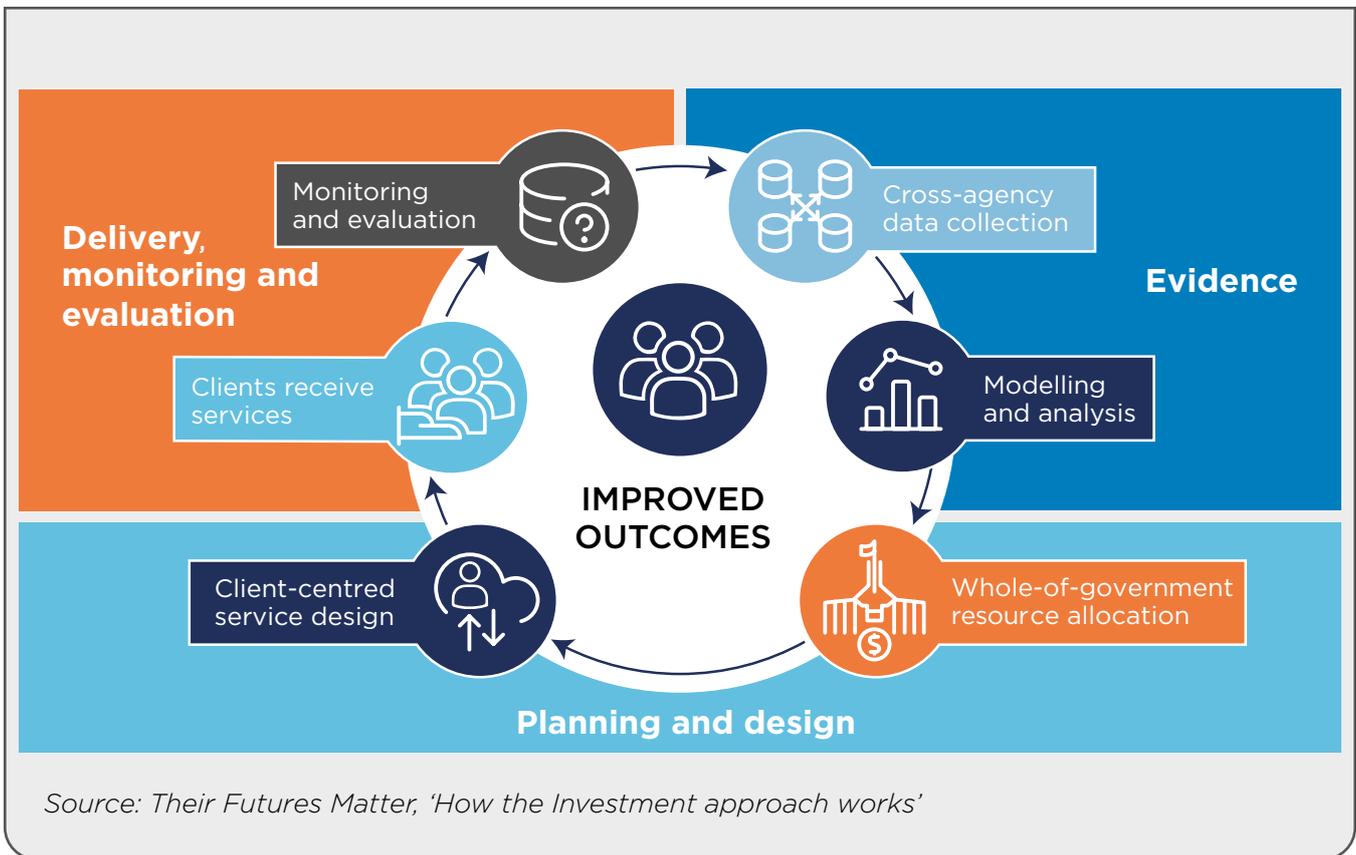
7.3.2 Case Study: DPIE Information Asset Register (IAR)

DPIE has a very effective Information Asset Register (IAR) that is used to create metadata records, link to corporate data sources and other resources, and identify the names of custodians, stewards, and creators within the organisation. The IAR has been used to document and identify high value information assets prior to publications of records and data through to the SEED environmental data portal. These records are also syndicated to Data.NSW open data portal.

The IAR has been in place for more than seven years and is supported by online training systems and a dedicated IAR team. A staff survey revealed awareness and use was limited to a few core business areas and those active users were very satisfied and very supportive.

In response to the survey results a second phase of integration has commenced and is aimed at promoting a broader culture of awareness and use across all business areas. Additional resources, including an IAR champions network, executive support, clarity around when and how to create and publish IAR records, and promotion of the benefits of good metadata management.

7.3.3 Case study: Pathways of Care Longitudinal Study (POCLS)

The Pathways of Care Longitudinal Study (POCLS) is the first study in Australia to link child protection, health, education and offending administrative data collected by the NSW and the Commonwealth governments for children in care. The study includes first-hand accounts from children, caregivers, caseworkers and teachers for a cohort of 4,126 children who entered out-of-home care (OOHC) in 2010-2011 in order to examine their experiences in OOHC and developmental pathways. The breadth of information in the data asset enables us to identify the risk factors that lead to poorer outcomes as well as the protective factors that mitigate these risks and result in improved outcomes.

The data asset was created in collaboration with OOHC stakeholders and research experts. The POCLS is of international and national significance and is likely to have greater explanatory power than other studies because of the large sample size, high retention rate across waves, the selection of gold standard measures and reliable/valid questions used. The linked data provides some outcome information for children that are lost to follow-up or do not participate in the interview component of the study.

To maximise the benefit of this rich longitudinal data asset to inform policy and practice, the POCLS Study Working Group continues to improve and expand the data asset, for example: the planned inclusion of linked data for young people after they turn 18 years old allows the opportunity to explore longer term outcomes for children who experience OOHC.

The POCLS data asset will be used to answer priority policy questions relating to OOHC policy and practice and specific requests of the Minister, Secretary or colleagues. As over 30% of children in OOHC are Aboriginal, the POCLS data asset will be used to improve how services and supports are designed and delivered in partnership with Aboriginal people and communities.

Analysts are able to access the POCLS data asset by way of NSW Department of Communities and Justice (DCJ) funded projects or in-kind through the DCJ External Research Program. Guidelines have been written to ensure a fair and consistent approach to accessing the POCLS data. The POCLS has developed guidelines, data user resources, data documentations, technical reports and data user training which are available on the POCLS webpage www.facs.nsw.gov.au/resources/research/pathways-of-care
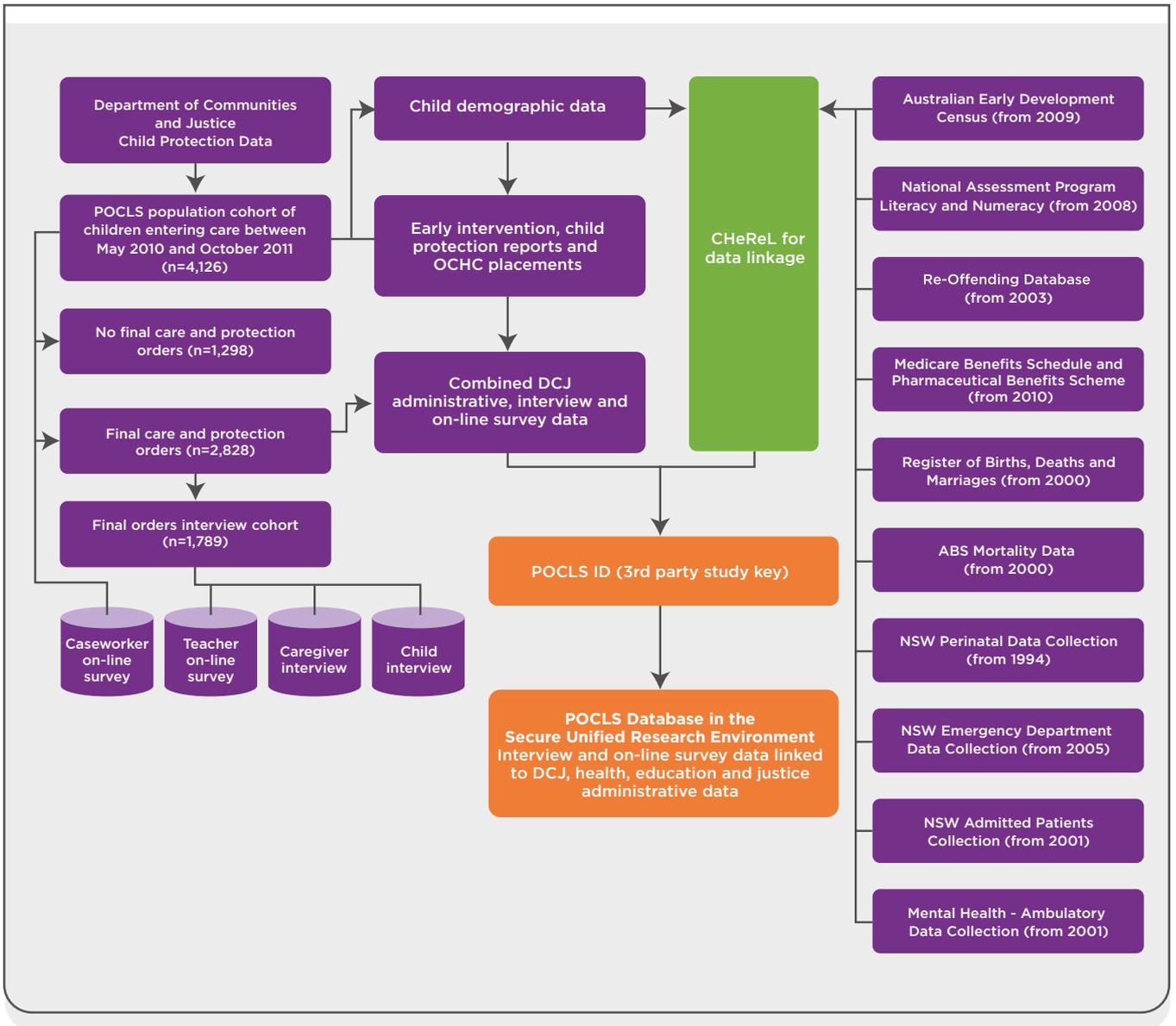
Figure: Pathways of Care Longitudinal Study of children in out-of-home care data asset

7.4 Strengthening transparency and trust

7.4.1 Case Study: Ngaramanala and the Pathways of Care Longitudinal Study (POCLS)

The POCLS is funded and lead by the NSW Department of Communities and Justice (DCJ) and examines the experiences of children and young people in OOHC, and their pathways in the domains of safety, physical health, socio-emotional wellbeing and cognitive development. The study links multiple data sources including Commonwealth and State child protection, health, education and offending administrative data with first-hand accounts from children, their caregivers, caseworkers and teachers. To date, 5 waves of data collection have been undertaken at 18-24 month intervals (10-year period) by way of in-depth face-to-face interviews with the caregivers of approximately 1,000 children and young people of which about 35% identify as Aboriginal. The POCLS is subject to ethics approval, including from the Aboriginal Health & Medical Research Council of NSW. For more information please see the Study objectives and strategic research agenda (Technical Report No.1) https://www.facs.nsw.gov.au/download?file=778733

The POCLS has a collaborative governance approach with Aboriginal representatives from Ngaramanala, AbSec and Jumbunna Institute for Indigenous Education and Research at UTS on its scientific group, advisory group and evidence to action group. Subject matter experts are consulted as needed.

The POCLS is in a privileged position to get regular briefings on Ngaramanala's work around IDS and IDG to raise our awareness and to improve our research resources, tools and processes to ensure we build a quality data asset that provides culturally appropriate evidence to inform policy, programs and practice. The POCLS added a preface to all its publications to reflect this.

Ngaramanala supported the POCLS through the following research activities in 2020:

- Consultation with the Aboriginal Health and Medical Research Council (AH&MRC) to discuss how the POCLS can update its processes, to understand what is considered current best practice and gather examples of best practice in other research projects

- Understanding and developing priority OOHC policy questions to inform POCLS analysis projects

- Facilitating the collaboration of contracted analysts and policy and practice colleagues, including Aboriginal colleagues, during the data analysis planning, analysis phase and interpretation of results

- Consultation with Aboriginal stakeholders about the most appropriate way to do develop culturally appropriate processes to draw the insights from the completed reports and translate findings into policy and practice.

Ngaramanala will assist the POCLS to embed IDS and IDG in its design, collection, analysis, dissemination and management of all data related to Aboriginal Australians. The POCLS will look to Ngaramanala for:

- guidelines on appropriate reporting of comparative analysis and context when reporting results about Aboriginal people

- review of the POCLS questionnaires and standardised measures of child development with a cultural lens to inform analysis, reporting and Wave 6 if funded

- advice on the POCLS interactive dashboards in terms of data collected for Aboriginal children

- application of the DCJ research governance principles once developed.

The POCLS team found engaging with Ngaramanala greatly raised our awareness of how we can continually improve our processes so that the research project is culturally sensitive and builds a data asset that is trusted and used to inform policies, practices and programs to improve the outcomes of Aboriginal children and families. Listening to Aboriginal knowledge and strengthening partnerships with Aboriginal stakeholders and community will lead to an improved design, data collection and interpretation of results.

With a culturally sensitive approach to research design, methods, interpretation and knowledge translation government and non-government organisations will have richer and higher quality data that reflects the participants and enable policy makers and practitioners to provide appropriate services and supports to achieve better outcomes for children and families.

7.4.2 Case study: Service Point

The majority of online government forms mandate that citizens enter their address as part of the transaction process. The universal nature of this action means that address entry has been standardised across government using Spatial Services' NSW Point web service. This standardisation allows for a common point to collect key information for data analytics. Recognising this, Spatial Services has developed Service Point. This application collects and stores information about each government transaction including its date, the government agency carrying out the transaction and, where applicable, the location of the government agency's office. It also ethically stores information about the individual transacting with government.

Service Point enhances service planning and delivery for NSW by adding location intelligence to government services. The Service Point application programming interface (API) enables web-based recording of geocoded government transactions by capturing de-identified location data at an aggregated Mesh Block level. Service Point also supports the aggregation of data by other administrative geographies outlined in the Australian Statistical Geography Standard (ASGS), such as Statistical Areas 1 to 4 and by local government areas, state electoral districts and federal electoral divisions. The service supports the collection, analysis and reporting of government services and their related transaction data in near real-time. The data is stored securely within government at Mesh Block level, but only published at a higher level of spatial and/or temporal aggregation.

Spatial Services adopted a 'privacy by design' approach when building Service Point and its related services. This ethical approach saw a well-defined focus on human values which was reflected in the build of Spatial Services' applications and tested with key stakeholders throughout the development lifecycle using customer centric techniques. This approach addressed privacy concerns raised by government agencies and NGOs and ultimately led to a better take up of the product offering.

7.5　Fostering culture, leadership and capability

7.5.1　Case study: NSW Health Data Literacy Capability Framework

NSW Health is developing a Data Literacy Capability Framework which enables better decisions, improved use of data, enhanced capability and strengthened data culture. The Framework will involve three key components: Developing role descriptions; Assessing data literacy capabilities; and Providing tailored training.

The Framework is built around 7 capability domains, including practicing good governance, communicating insights and contributing to a data culture.
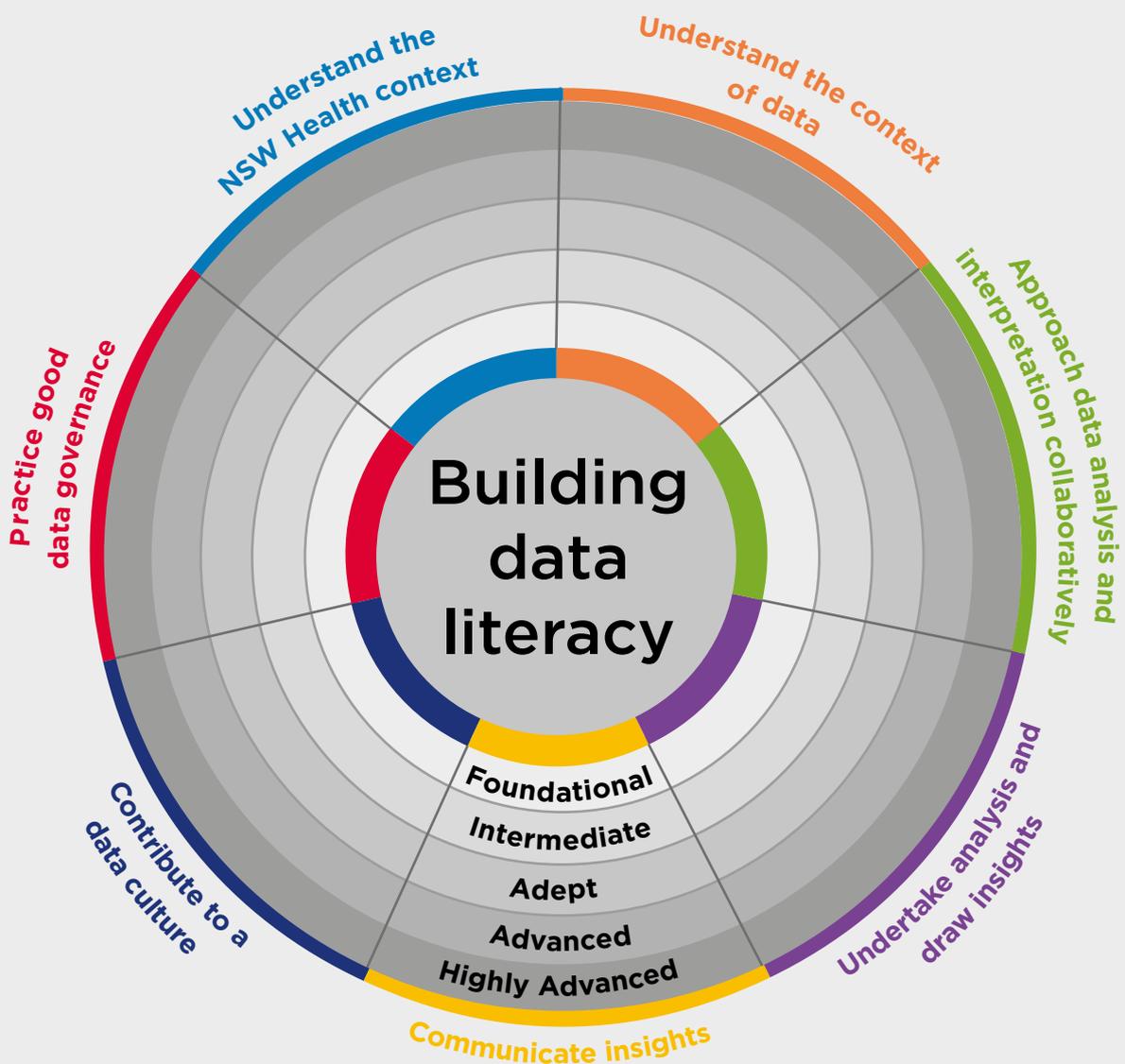
8. Appendix B – Actions and future outlook

Table 1: Data challenges, actions, and future outlook

Data challenges	Actions to meet the challenges	What the future looks like
Accelerating actionable insights		
• Insights ad hoc and not available to decision-makers when they need them • Variable alignment to strategic priorities for better community outcomes • Variable use of advanced analytics • Variable secure analytics platform capability and interoperability • Variable data linkage capacity	• Consistent data operating model across NSW Government that reduces duplication, improves efficiency, and harnesses advanced analytics • Self-service insights hubs for use across the sector • Sector-wide secure analytics and data exchange capability, including privacy enhancing technologies • Secure hosting of enduring linked data assets	• Data and insights are delivered to decision-makers through self-service and user friendly products and services • Delivery of insights is accelerated by using modern, interoperable platforms and processes and advanced analytics • Insights are driven by strategic priorities that lead to better community outcomes • Richer insights available more rapidly and safely across government
Treating data as an asset		
• Investment in data collection, management, use, and sharing is variable • Visibility of data sets is variable • Data silos and duplication • Variable use of standards and variable data quality • Variable access to linked data assets	• Recognise data and associated metadata as a significant state asset • Develop guidance on calculating cost of managing data and benefits of using and sharing it • Develop a spend category for government procurement of data and data services • Where appropriate, procure private sector data of high value across the sector centrally • Support and coordinate sharing of agency data of high value across the sector • Support and coordinate development of enduring linked data assets and ongoing stewardship	• Investment in data that is of high value across the sector is strategic and coordinated • The value of NSW government data is understood • NSW government data is managed effectively and is well described and understood and easily integrated • Enduring data assets are widely available and used across government for the benefit of the community

Strengthening transparency and trust		
• Customers are rightly interested in how their data is collected, managed, used, and shared • Current governance systems do not include a process to recognise Aboriginal cultural authority when decisions are made about Aboriginal data • Current data collection processes have been developed to collect data about what agencies want to know, rather than what Aboriginal peoples want and need to have the evidence to drive change • Aboriginal peoples in NSW do not have access to their data to be able to make decisions for their people and engage in discussions with the Government as equals about policies and programs • NSW government legislative and data policy context is complex and difficult to apply consistently • Data volumes and complexity are increasing making data harder to manage and protect • Data sharing pathways are variable and time-consuming • Release of open data is variable	• Undertake a statutory review of the NSW Data Sharing (Government Sector) Act 2015 • Engage with the Aboriginal Community to gain an understanding of the peoples that wish to participate in community engagement about the Indigenous Data Sovereignty and Indigenous Data Governance reforms included in the Data Strategy • Consolidate NSW Government data policy, including developing a common data sharing agreement and streamlined approval process across government, aligning with the Australian Government's data sharing scheme as appropriate; and working with the Aboriginal Community to ensure inclusion of Indigenous Data Sovereignty and Indigenous Data Governance principles • Work with the Aboriginal Community to implement and evaluate the Indigenous Data Sovereignty and Indigenous Data Governance Principles in the Data Strategy and in the consolidated whole of government data policy, including data sharing • Develop a clear set of data ethics principles drawing on AI Ethics principles • Publish more open data to promote government transparency and provide a platform for innovation	• Data is managed, used, and shared in accordance with the highest privacy, security, and ethical standards so that people of NSW have confidence that their data is being collected, managed, used, and shared appropriately, responsibly and in their best interest • Research, evaluation and data analysis is safe, ethical, respectful, responsible, high quality and of benefit to Aboriginal children, families and communities • Data sharing pathways are consistent, streamlined and well understood, and incorporate Indigenous Data Sovereignty and Indigenous Data Governance principles • More government data is published as open data promoting transparency and innovation

Fostering culture, leadership, and capability		
• Lack of clarity of data leadership and responsibility across NSW Government • Data literacy, capability and capacity is variable across NSW government	• Appoint Cluster Chief Data Officers to lead and champion data use and sharing across government • Establish a NSW Data Leadership Group • Develop a Data Roadmap for each cluster of government departments and agencies • Assess data maturity across NSW government to determine baseline and inform capability building priorities	• There is a collaborative and coordinated approach to using and sharing data and insights across NSW Government • Data literacy and capability is consistent and high across NSW government • Data is consistently sought and used to inform decision-making