Conditions Enabling Open Data and Promoting a Data Sharing Culture 2017

A Report for the Information and Privacy Commission of New South Wales

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UNSW AUSTRALIA | Law

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PART 1: Executive Summary

This UNSW Law Report was commissioned by the NSW Information Commissioner and NSW Open Data Advocate to provide contemporary insights to support the promotion of Open Government and Open Data. To do so the Report analysed legislation, policy, regulatory settings, roles and responsibilities for leadership, culture and operations in leading jurisdictions as identified in the Open Data Barometer Report.

Communications were made with government agencies, Open Data departments and organisations in these jurisdictions in the period from December 2016 to the end of February 2017 to seek direct input as to how the frameworks have operated in practice. We contacted many entities in the United Kingdom[1], United States[2], France[3], Canada[4], and New Zealand[5]. The findings are therefore a snapshot of progress at a point-in-time. Open Data is a fast-moving area with new programs, policies and legislation emerging globally. The research in this **Report is current to March 31, 2017.** There are likely to have been developments since this time.

In practice the research has highlighted how diverse, inter-connected and context-specific each country's approach has been. In particular, it is clear that precisely because of the breadth of action some leading countries have taken it is difficult to isolate the particular contribution of any one element. However, the existing legislative and policy settings have informed advances in Open Data in the jurisdictions examined.

Enablers in action from leading jurisdictions

The initial drivers of Open Data in the United Kingdom, the United States, Canada and France were external Open Data companies and civil society such as the Sunlight Foundation requesting access to datasets. Open Data in France and the United Kingdom was driven at the municipal level first in the cities of Rennes, Leeds and London before national action plans were adopted. The US and UK responded to these demands with significant legislative and policy enablers. These initiatives continue to develop, for example, the role of the Information Commissioner and incorporation of the Data Protection Commissioner into this role. Successfully implementing an Open Data agenda requires a suite of five mutually-supporting actions each reinforcing each other. These include: leadership at the national and sub-national levels; adopting appropriate legislative, policy and regulatory settings; cultural change in the public sector and broader community; and collaboration and communication between government agencies and external stakeholders. These enablers are summarised below – more detailed descriptions of the enablers are at Part 3.

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[1] **United Kingdom:** Leeds Council, Data Mill North, Scottish Cities Alliance, the City of London, the Open Data Institute, Socrata, the Office of the Prime Minister's Cabinet, and the Department for Environment, Food and Rural Affairs.

[2] **United States:** The Obama Administration, the city of San Francisco, GovDelivery and the Policy Lab.

[3] **France:** ETALAB, OPENDATA France, Data Gouvernance France, the French Information Industry of Online Information, General Secretary for Modernisation of Public Action, Marie de Paris, and Atelier Parisien d'Urbanisme.

[4] **Canada**: Treasury Board Canada, Treasury Board of Ontario, and the city of Toronto.

[5] **New Zealand:** The Department of Land Information New Zealand (LINZ), Department of Internal Affairs, Office of the Government Chief Information Officer, State Services Commission, the Ombudsman Office, New Zealand Data Futures and universities.

Leadership

The leadership enabler incentivises and sets the tone for open government and Open Data. This includes:

- Public support for Open Data by governments, ministers and agency heads.
- Actions by governmental leaders to encourage the release of data and a change in the attitude toward government data that favours sharing and release.
- Establishing processes and mechanisms that mandate data release and demonstrate this support.
- Establishing processes to identify strategic datasets to be opened that will drive economic interests.

President and Prime Minister's Offices issued public Ministerial Letters and Memoranda to prioritise and mandate open, transparent, and accountable government which included the opening of government data such as seen under the Presidential leadership of Barack Obama, followed by Prime Minister David Cameron, and Prime Minister Justin Trudeau. Department Heads became Open Data champions leading to a trickle-down effect and in the UK departmental heads are regulated data custodians. In Canada Ministerial Letters have been issued at the national, provincial and municipal levels demonstrating a unified and consistent vision for open government and Open Data.

Legislation

Legislative enablers provide a directive framework from government setting rights and responsibilities. In this context, it would include law making for:

- An authorising legislative environment and/or greater utilisation of existing legislative enablers including the 'public interest test'.
- Rights for sharing and accessing digital information and in the context of Open Data clear definitions to promote protection of data and sound regulatory guidance together with broad regulatory oversight.
- Obligations and duties on data custodians (including data protections and privacy principles).
- Right to re-use machine readable data.
- Recognition of a gradated approach to data management that supports Open Data and data sharing through balancing and protecting of other rights including privacy.
- Legislated priorities to facilitate direction of resources.
- Facilitate data sharing between stakeholders.

Legislative measures in the UK, US and France have mandated that data be open by default, and that **Open Data means machine-readable data in a standardised format delivered with a standardised licence.** These jurisdictions see that smarter data can be a policy enabler, leading to efficiencies. They also acknowledge and reinforce that **a data driven economy relies on Open Data being machine readable and linked to allow advanced analytics and innovative applications.**

Policy

The policy enabler provides a direction or principle for action and decision making to meet defined objectives. The objectives may be achieved in a variety of ways tailored to a department's or agency's environment. In the context of government data, policies may be directed at specific datasets such as geo-spatial data, or at datasets with certain attributes, such as datasets containing personal information which require de-identification of the information prior to release. This includes setting policies that:

- State government intentions and expectations to guide agency and staff decisions and priorities, particularly in how to stimulate Open Data and balance or integrate data and privacy perspectives.

- Ensure there is an appropriate suite of regulatory guidance on more detailed issues as diverse as; anonymisation, data security, privacy, data minimisation, data sharing, organisational approaches to data.
- Provide authoritative implementation guidelines, measurements and methodologies to assess impact.
- Set the goals and boundaries for collaborative engagements.

Jurisdictions such as Canada and New Zealand encourage and facilitate Open Data through policy and collaboration. Like the UK, US and France these countries have **articulated National Action Plans** that discuss how they will work towards the goals in the International Open Data and G8 Open Data Charters.

In most countries, **Open Data Policy is deeply entrenched in frameworks, directives, guidelines, charters and principles** which are embedded in data governance frameworks. These frameworks draw upon a sound legislative basis to authorise Open Data. Leading jurisdictions have mature data governance frameworks that include clearly articulated roles and responsibilities, and provide detailed information and guidance around processes and tools.

The United Kingdom, the United States and France used a **combination of legislation and policy to mandate Open Data.** Canada and New Zealand have opted to use policy mechanisms to achieve Open Data and open government goals. This coordination is a reminder that a multi-faceted approach is needed and that integrating a number of enablers offers benefits.

Regulatory

The regulatory enabler provides authoritative and enforceable rules with an expectation of compliance to prevent harms or improve outcomes. It includes regulatory action to:

- Inject certainty and provide guidance to government agencies in meeting their obligations and expectations under what can be complex legislation and policy frameworks.
- Promote and enforce rights to data and balance appropriate restrictions including privacy.
- Support or sanction behaviour.
- Give effect to legislation with information and other tools to ensure conduct is consistent with legislation.
- Implement systems and approaches that facilitate an anticipatory regulatory approach to ensure risk identification; classification and appropriate mitigation/remediation strategies are identified and developed.
- Provide tangible pathways for oversight, review and redress.

In most countries, **the right to information regimes provide the initial and conceptual basis for Open Data.** This right to information is **set in a regulatory environment that guides agencies** in meeting their obligations and expectations under legislation and policy, and monitors, supports and enforces policy and legislation. This has meant that in a country such as the UK the Information Commissioner's Office (ICO) enforces rights to data, is able to take complaints, approves publication schemes (schemes to identify open datasets and registries) of public authorities, assesses good practice, establishes consistent frameworks to facilitate the release of data and harmoniously balance privacy and other protections, imposes fines for non-compliance, recommends information including datasets to be opened, prosecutes those who commit criminal offences under the *Freedom of Information Act*, and hears appeals.

All leading jurisdictions have **dedicated funded roles of Chief Information Officers (CIOs) at the national and often sub-national levels.** Research and communication with jurisdictions indicated that CIOs or equivalent were essential to effectively championing and delivering Open Data. The roles of CIO vary from jurisdiction to jurisdiction with some having responsibility and are

accountable for delivering Open Data, while in other jurisdictions the role focused more on a facilitator and cultural driver.

In leading jurisdictions **privacy and data assurances are seen as enablers to open government as opposed to barriers.** The legislative and regulatory environment recognises the requirement to balance release of data together with privacy and to provide clarity to authorise release of data in certain circumstances. For example, the UK Information Commissioner (IC) has issued clarification that data protection law does not apply to data that has been anonymised. There are privacy and data assurance challenges in Open Data but these are met by providing clear guidance on processes of de-identification and anonymisation, developing Codes of Practice and privacy impact assessments such as those approved by the UK IC, and management of data quality assurance through disclosure of inaccuracies and limitation of datasets. The ICO performs many of these functions in the UK. In other countries, such as Canada and the US the Chief Information Officer's Department (eg. Treasury Board) performs some of these functions.

In most countries, there is a **designated national portal /platform** for open datasets accompanied by a standardised license that is compatible with a Creative Commons License. Metadata is standardised in most countries, and is often the Sunlight Foundation's recommended standard proposed by the World Wide Web Consortium. Datasets are inventoried and catalogued. Limitations and restrictions of datasets are provided along with suggestions as to optimal uses and tools to use for the dataset. Regulatory bodies have been key in advocating for these types of measures, and in providing guidance.

Culture and Collaboration

The culture and collaboration enabler includes:

- Actions within government to support Open Data and influence agency and staff attitudes.
- Actions outside government to support and promote Open Data availability and utilisation.
- Actions to engage the community in the Open Data agenda, elevate understanding and address concerns.
- Cultivation of wider horizontal sharing between international, national and sub-national levels of government, and with the greater public including external stakeholders within and outside a jurisdiction (eg. the leading jurisdictions were the most cooperative in sharing information and providing guidance for the purpose of these reports).

While jurisdictions have adopted different approaches to Open Data, all jurisdictions indicated that **culture and collaboration were the most important factors** for developing and realising long-term goals. Collaboration is required along the data lifecycle. Collaborative efforts were diversified including extensive collaboration with external Open Data champions (corporations and organisations), inter-agency to utilise expert skill-sets, within an agency as different members used and were responsible for different datasets, and between national and sub-national levels.

Operational

The operational enabler addresses the many challenges and support opportunities in the day-to-day process of making data open. It includes actions such as:

- Developing a greater capability in Open Data and an understanding of the legislative and operational enablers within government and between government and the private sector to manage and share Open Data.
- Developing strategies to fund Open Data.
- Story sharing of successful programs and outcomes including establishing databases or repositories and engaged communities of private, public sectors experts, researchers and citizens.

- Demonstrating the value of data through identifying a need or a problem that could be solved with Open Data and/or better data.

Leading jurisdictions indicated that **data on its own will not lead to improved data sharing and an Open Data culture.** You must **start with a pilot study to solve a problem or tell a story**. The sharing of these successes becomes the foundation to incentivise other organisations and agencies to open data. Story telling has been enabled through establishment of services including UKAuthority (UKA) a fully integrated, comprehensive mix of multi-media channels. Integral to the success of storytelling has been the application of digital technologies to promote the message and access to information and decision makers. This UKA Live, interactive round table debates and events bring thought leaders, the community and policy makers together in an environment using social media and email. Feedback is circulated through editorial commentary and a research database of 36,300 decision makers across central and local government, police, fire, health and ancillary services.

This then transcends towards a government-wide data driven culture. The OPENDefra example is highlighted below as it combined leadership (from the UK Prime Minister), legislation (EU INSPIRE Directive), cultural change, and regulatory (Privacy Impact Assessment and UK Office of the Information Commissioner) approaches.

The story most showcased in the UK and abroad is the success of OPENDefra.

Prime Minister David Cameron issued a Ministerial Letter to the Department for Environment, Food and Rural Affairs (DEFRA) that mandated certain datasets such as LIDAR (Light Detection And Ranging Open Data — 3D height flood modelling) and a set quota of 8,000 datasets be opened within 18 months. In order to achieve these goals agencies within DEFRA were forced to collaborate with one another. This required regular workshops to discuss trial and solve practical problems such as best de-identification methods. DEFRA worked closely with external Open Data champions such as the Open Data Institute.

The National Food Survey agency conducted a privacy impact assessment (PIA) and published it. There is a version open to public comment for the PIA to provide feedback for current and future use. The PIA recognises that the UK Office of the Information Commissioner (OIC) made clear that data protection law does not apply to data that has been anonymised. The OIC Anonymisation Code of Practice was the starting point and re-identification was considered in the context of this guidance which requires assessment of the risk of harm resulting from any re-identification. DEFRA determined that any re-identification would not reveal 'sensitive' information that would impact on individuals and government that would warrant additional restrictions. The PIA is considered to be a model for future opening of datasets containing confidential personal information**. This approach has developed with the UK IC recommending the establishment and maintenance of a log recorded as a dataset of issues arising from PIAs.** The log is then used to record, track and report on the operation of PIAs to assist organisations in identifying and minimising the privacy risks of new projects or policies. This approach enables Open Data and a sound anticipatory regulatory approach, promotes a culture of trusted openness, shared success and collaboration.

As a result of the opening of LIDAR data many applications and experiments occurred including resources for schools, the game Minecraft, modelling of snowfall for scientists working on climate change, in urban planning and civil engineering to help plan and manage infrastructure by transport, energy and utility companies, and business to inform vinicultural ventures. Previously this data was a revenue generator, causing some concerns over revenue reduction if the data were to be opened. However, while revenue disappeared, DEFRA saved money by opening the data. Prior to Open Data, many of the flood predictions were done by companies using less reliable datasets. The models and applications in turn had to be carefully reviewed due to data

quality issues. The opening and subsequent re-use of the high quality LIDAR data has alleviated testing and evaluation costs. More importantly, communications with those involved in OPENDefra felt that the process allowed their departments to move from data sharing reluctance to one that embraces data sharing, open government and Open Data on an enterprise-wide basis. They now have an enabled data sharing and Open Data culture.

Insights from the research for consideration in the New South Wales (NSW) context

NSW has taken many progressive measures to move towards Open Government and Open Data.

While NSW has already many progressive measures towards achieving the goal of Open Data, based upon the best practices identified overseas, achievement of Open Data could be advanced through consideration of the enablers identified in the research to maximise the likelihood of successfully completing that goal. The following is a compilation of enablers identified in other jurisdictions that have been shown to have benefit and could be considered in NSW. These are grouped to reflect the structure used in the report of: Leadership, Legislative, Policy, Regulatory, Culture and Collaboration, and Operational and are accompanied by an assessment of likelihood of impact to support their further consideration.

Leadership

- Adoption of the International Open Data Charter consistent with the Commonwealth Government's recent adoption as part of implementing the Open Government National Action Plan[6].
- Use of a public letter/directive from the head of government to Ministers mandating that their departments implement (where possible) the accountability, transparency and related principles of Open Government and Open Data, including the creation of Open Datasets in machine-readable format.
- Champion and where relevant adopt national and international Open Data agendas that balance Open Data and data protection factors such as the EU Data Protection Regulation approach and current developments including the Productivity Commission's examination of Data Availability and Use.
- Requiring qualitative and quantitative impact measurements for all Open Government and Open Data initiatives.
- Supporting cross-sector collaborations (similar to the New Zealand Data Futures partnership) to drive trusted data use.
- Ensuring that all new initiatives using or creating significant data include consideration of Open Data principles.

Impact

These priorities were selected in recognition of the advancements in the UK and other progressive jurisdictions that have adopted an articulated commitment at leadership levels. These commitments are derived from authorities, shared and systematised through inclusion in accountability documents that are subject to review and independent assessment either domestically or internationally. In NSW they would reinforce commitments such as the 2012 Premier's Memorandum on Open Government.[7]

[6] https://blog.data.gov.au/news-media/blog/australia-adopts-international-open-data-charter
[7] M2012-10 *Open Government* available at http://arp.nsw.gov.au/m2012-10-open-government

Legislation

- Identify and examine contemporary legislative approaches to Open Data and information sharing with a particular focus on the objectives of simplifying and harmonising the personal data regulatory environment for businesses and governments, and providing data protection rights for individuals.
- Examine the extant legislative environment to identify existing 'public interest' test mechanisms that balance data release and ensure appropriate safeguards together with opportunities to strengthen the legislative environment by consolidating and clarifying rights and responsibilities for government entities, business and citizens.
- Consider the authorising environment for Open Data including moving from a legislative framework that authorises data release to one that mandates pro-active data release and making datasets open in machine readable format if there has been a successful right to information request.

Impact

Many progressive jurisdictions have supported Open Data through an authorising environment that reflects the object of opening data. Those jurisdictions clearly articulate the circumstances or data categories that attract or exclude privacy and other safeguards. Additionally these jurisdictions enshrine in legislation the public interest or other mechanisms to balance interests. This approach is apparent under the Commonwealth *Privacy Act 1988* and has been included in legislative reform such as the South Australian *Data Sharing (Public Sector) Act 2016*. However, this balancing approach is not mirrored under the all relevant legislation in NSW and an examination of extant legislation would identify appropriate safeguards together with support for Open Data.

This approach results in a balanced assessment of benefits and risks against transparent criteria and provides assurance to the community that the decision to release or not is based on all relevant factors. The approach also stimulates process to manage data towards release and trusted application.

Policy

- Developing an integrated policy approach unifying Open Data and privacy dimensions to provide a single path for considering release, rather than separate.
- Develop a standardised "Open Government License" that is compatible with the Creative Commons License.
- Mandating Departments to open specific datasets, as well as a quota of datasets compelling forced collaboration. This method has proven highly effective in the UK. Datasets impacting on these industries should be considered for prioritisation in open machine-readable formats.
- Mandate departments to create machine-readable standardised formats for datasets which allows for analytics and linked data applications.
- Mandate metadata standards (preferably an international metadata standard) for all datasets, licenses and machine-readable formats, with datasets to be released on the NSW Portal[8].
- In situations where there has been a successful right to information request, mandate pro-active open release of those datasets in machine readable format[9] .

[8] NSW agencies are encouraged currently to 'release better data in accessible, consumable formats with metadata and quality statements' … 'release data faster using automated processes, standard data categories and trusted user models'… and 'release more data and make it discoverable through central portals' (2016 NSW Open Data Policy).

[9] This is the similar to the United Kingdom, United States and French approaches.

- Develop policies reflective of an anticipatory approach to harm minimisation and regulation generally.

Impact

Policy settings can positively impact the availability of Open Data within the existing legislative environment and may be advanced in the immediate to short term. Likewise economic and service delivery imperatives should inform prioritisation of release of data.

Regulatory

- Champion and showcase model Privacy Impact Assessments for Open Data that reflect a balancing of risks and overall benefits of data release based on the authority provided in regulatory guidance.
- Include an anticipatory regulatory approach that promotes Open Data but ensure ongoing evaluation and assessment of security and privacy risks.
- Examine existing legislative mechanisms that provide greater regulatory certainty, for example promotion of the 'public interest' test established.
- Develop in-depth guidelines on anonymisation and de-identification that, like those issued by the UK OIC consider a balanced approach to the risk of harm resulting from any re-identification.
- Establish networks similar to the UK Anonymisation Network (UKAN) to share best practice and solve anonymisation problems.

Impact

Regulatory structures and settings can positively impact the availability of Open Data within the existing legislative environment and may be advanced in the immediate to short term. Likewise economic and service delivery imperatives should inform prioritisation of release of data. However, this balancing approach is not mirrored under the all relevant legislation in NSW which has not been subject to review and an examination of extant legislation would identify appropriate safeguards together with support for Open Data.

Culture and collaboration

- Improve collaboration with the broader community around a range of potential issues using concepts such as New Zealand's 'Social License'[10].
- Highlight examples and case studies of the benefits of Open Data to the community and within the public sector, including by encouraging participation in data events (eg 'gov hacks') and communication story telling platforms/services such UKA to promote the message and access to information and decision makers .
- Promote collaboration by setting a quota for open datasets[11].
- Establish a network similar to UKAN (universities, Open Data Institute and the Office of Statistics in the UK) to share best practice and discuss and solve problems. Complement this with an Open Data Community of practice.
- Explore ways to improve collaboration with Open Data companies and organisations such as pilot studies, external stakeholder involvement on boards, workshops, and data cafes including communication/media approach similar to UKA.
- Adopt policy and educational approaches that commit to and promote Open Data and a spectrum based approach to de-personalised data as distinct from other forms of data[12].

[10] see http://datafutures.co.nz/our-work-2/talking-to-new-zealanders/social-licence/
[11] This method has proven highly effective in the UK.
[12] https://understandingpatientdata.org.uk/sites/default/files/2017-04/Data%20vocabulary_Good%20Business%20report%20March%202017_0.pdf

- Adopt an incubator model where either an Open Data company is embedded with an agency to co-develop ideas and applications on models, or engage with entities such as Code for Australia to bring in ideas and expertise.

Impact

Cultural change and citizen engagement has been instrumental in supporting Open Data agendas in progressive jurisdictions. It is also recognised as impactful and essential in current developments in the EU and through the recent draft report of the Australian Productivity Commission. Following the establishment of an authorising environment, legislation may not always keep pace with rapid change in a dynamic environment. New forms of establishing and conveying rights and responsibilities will provide necessary vehicles to regularly engage with citizens, and provide ongoing transparency and accountability.

Broad consultation has supported engagement between the government sector, businesses and citizens to promote identification of opportunities to Open Data. This consultation has also led to an understanding of economic value; technological and service developments; and built trust in the responsible custodianship of data by governments and, where relevant, businesses. The commitment to build and maintain public trust to address concerns regarding data sharing has been identified as a priority under Australia's Open Government Partnership National Action Plan[13]. This commitment is designed to support the Open Data and digital transformation commitment. This presents a real opportunity for NSW to engage and align with national developments to advance the Open Data agenda with clear support and provides greater clarity and consistency for business and citizens.

Operational

- Publish a complete catalogue of all datasets, including datasets that are restricted.
- Identify which datasets are important economic drivers for growth in the regional context[14], with prioritisation for datasets which will promote growth and development in regional areas[15].
- Explicitly fund departments opening up high-value datasets in machine-readable format.
- Adopt an international metadata standard and making this mandatory across all datasets.
- Consider a one stop shop portal/platform for all jurisdiction data, and support national approaches that that can interact and pull data from regional and other portals.
- Identify workforce skills/knowledge gaps and opportunities to work with local government and other government agencies.
- Publishing milestones, progress reports and dashboards that allow monitoring of progress toward Open Data.

Impact

This enabler is important because many barriers to Open Data lie in issues such as technology, utility of format, communications and optimising delivery of data. The experience gained through successful implementation in initiatives such as LIDAR in the UK can also be shared and monitored through sound operational systems which enable it to be modelled to promote future Open Data.

[13] http://ogpau.pmc.gov.au/sites/default/files/posts/2017/01/australias-first-open-government-national-action-plan-final.pdf

[14] Currently NSW has strong economic diversity in services output including financial and insurance services, health care and social assistance, professional, scientific and technical services. Service industries may be improved through smarter data and analytics. Open Data should be seen as an opportunity to enhance these services.

[15] These areas include biotechnology, renewable energy, mining, fishing and agriculture.

Measuring and impact

Measuring the impact of Open Data and open government is essential in determining whether new measures are achieving their goals, and having desirable impact. In some jurisdictions the opening of government data has been justified by expected economic benefits from increased efficiency and innovation within government. Open data has also been justified as a political benefit of transparency and accountability of government. These are two very different goals which require separate measurement.

Financial Benefit: One approach would be to commission a follow-up study on certain key open datasets after they have been opened for five years similar to the study undertaken by the Danish Government. The study assessed direct financial benefits from opening utilities, address data, the Land Registry and the Central Business Registry and found that it cost two million EUR to open the data, but that the direct financial benefits from 2005-2009 were 62 million EUR.[16]

Open Government (transparency and accountability): One approach to consider would be to review the current suite of Open Data assessment frameworks (described in Part 3) and apply them to the NSW context. As an example, the criteria and questions used in the Open Data Barometer[17] could be used to set an initial benchmark for NSW and track progress. Another approach would be to use the OECD Open Data criteria to conduct a review of the current maturity of Open Data approaches, using a similar methodology used in recent OECD Open Government Data reviews of Poland and Mexico.[18] These methods measure Open Data from the perspective of leading to transparent and accountable government; they do not measure financial benefits and efficiencies that are derived by Open Data.

Ideally NSW would adopt a measurement system or systems that measured both efficiencies saved, and the implementation and impact on transparent and accountable government.

Potential benefits from implementing enablers

The experience of the jurisdictions examined highlights the diversity of approaches that are needed to drive Open Data. High performing jurisdictions adopted a broad suite of measures and implemented these flexibly but supported by an overall commitment.

The lesson for NSW is that actions should be taken on a range of fronts using a suite of measures rather than trying to pick winners or the 'right mix'. The goal should be to see within five years a step-change in the Open Data environment in NSW that includes:

- a shared commitment across the NSW government to Open Data

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[16] McMurren, J., Verhulst, S. and Young, A., Denmark's Open Address Data Set: Consolidating and Freeing up Address Data (January 2016) available at http://odimpact.org/static/files/case-study

[17] **Open Data Barometer (ODB)** is an expert assessment system that is scored by peer-reviewed local expert survey, a government self-assessment via a simplified survey and secondary data selected to complement the surveys to assess 'Readiness' portion of the assessment (data from the World Economic Forum, World Bank, United National e-Government Survey and Freedom House). Open Data initiatives are assessed by:

> *Readiness:* How prepared are governments for Open Data initiatives? What policies are in place?
> *Implementation*: Are governments putting their commitments into practice?
> *Impact:* Is Open Data being used in ways that bring practical benefit?

ODB is assessed across fifteen types of datasets: map data, land ownership, national statistics, detailed budget, government spend, company register, legislation, public transport timetables, international trade, health sector performance, primary or secondary education performance, crime statistics, national environment statistics, and national election results.

[18] see http://www.oecd.org/gov/open-government-data-review-of-mexico-9789264259270-en.htm for the report on Mexico

- routine creation and release of data sets that are easily accessible to the public
- a legislative and regulatory environment supporting the NSW Open Data Policy principle of "Open by default, protected where required"
- partnerships between sectors to take up and apply data to address community priorities
- direct financial and service delivery benefit from opening key datasets.

Directions for future research

This report is necessarily a snapshot of a rapidly moving landscape and highlights a number of areas where further research would support the drive to Open Data in NSW. Particular priorities should include:

- measuring the benefits of Open Data to the community and government in a consistent, transparent way
- how to improve user/community awareness and take-up in Open Data
- how to foster and improve Open Data for smart cities and regional areas
- measuring the direct financial and service delivery benefit to both the public and private sectors
- applying and measuring the effect of Open Data initiatives on public participation and government policy development
- developing secure sustainable funding for Open Data projects
- participate in metrics for Open Data by councils and smart cities in NSW, and potentially for all of Australia and on a global basis
- how to develop and improve skills in data collection and management among public servants
- developing specific strategies to address key concerns in NSW (For example, the UK's Anti-Corruption Strategy which is embedded into its Open Government National Action Plan 2016-2018)
- developing standard formats and processes (for example, the Contracting 5 (C5) initiative at the Open Government Partnership Global Summit 2016 has the UK, France, Mexico, Colombia and the Ukraine working to develop and use the Open Contracting Data Standard, and will use data to evaluate the new standard to evaluate public procurement)[19]
- development and support for different stakeholders other than government (for example researchers, essential industries in the private sector) to adopt open access and Open Data policies[20]
- assessment of benefits and risks of opening data and sharing sensitive datasets with researchers and private organisations (see UK Digital Economy Bill 2016).

[19] Open Contracting Data Standard: Documentation, http://standard.open-contracting.org/latest/en/

[20] FOSTER, Next Steps for Open Access and Open Data Research Policy (Nov. 22 2016) https://www.fosteropenscience.eu/event/next-steps-open-access-and-open-data-research-policy

PART 2: Terms of Reference

This UNSW Law Report was commissioned by the NSW Information Commissioner and NSW Open Data Advocate to provide contemporary insights to support the promotion of Open Government and Open Data.

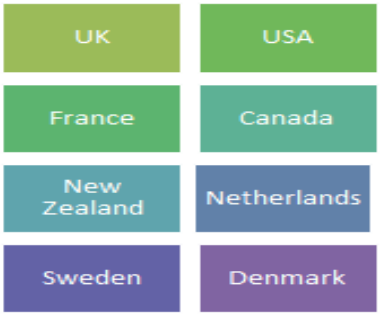
The audience for the report will include the Information and Privacy Commission (IPC), members of the Steering Committee and senior policy-makers and advisors with an interest or role in supporting Open Data. The intention is that the report provides actionable advice to inform future decisions by agencies on the most worthwhile strategies for supporting and enabling Open Data in NSW.

Methodology and Aims

The overall research aim is to undertake a comparative analysis of how Open Data may be supported and advanced through identifying mechanisms, which promote Open Data release and a culture of data sharing. Subsidiary research aims are to:

- Describe what 'Open Data' means in practice and how it can be achieved through legislative, policy and regulatory conditions.
- Identify and describe five to eight different legislative, policy and regulatory mechanisms used in comparative jurisdictions to promote and support Open Data and a culture of data sharing, together with 10 to 15 examples of the outcomes for these conditions.
- Practical examples considered as case studies.
- Identify mechanisms applied in international jurisdictions that implement measures to evaluate the progress of Open Data agendas, including identifying agencies and appointees responsible for advancing Open Data such as the NSW Open Data Advocate.
- Provide a description of those evaluation mechanisms.
- Provide exemplars from selected jurisdictions.
- Analyse laws, policies and regulations for national jurisdictions identified as leading the field in the Open Data Barometers Report.
- Provide a final report that has a practical focus to provide tangible examples of positive public outcomes derived from legislative and policy arrangements that support Open Data.

Communications were made with government agencies, Open Data departments and organisations in these jurisdictions to seek direct input as to how the frameworks have operated in practice. This included contacting organisations at national and sub-national levels. Leading jurisdictions and organisations contacted are listed below:



UK: Leeds Council, Data Mill North, Scottish Cities Alliance, the City of London, the Open Data Institute, Socrata, Office of the Prime Ministers' Cabinet, and Department for Environment, Food & Rural Affairs.
USA: The Obama Administration, the city of San Francisco, GovDelivery, and the Policy Lab.
France: ETALAB, OPENDATA France, Data Gouvernance France, the French Information Industry of Online Information, General Secretary for the Modernisation of Public Action, Mairie de Paris, Aelier Parisien d'Urbanisme **Canada:** Treasury Board Canada, Treasury Board Ontario, City of Toronto
New Zealand: The Department of Land Information New Zealand (LINZ), Department of Internal Affairs (DIA), Office of the Government Chief Information Officer (GCIO), State Services Commission (SSC), New Zealand Data Futures Partnership, the Ombudsman Office, and various universities engaged with the government working in Open Data
Sweden: The Royal Library, State Service Centre, and the Swedish National Quality Registries
Netherlands: Data.overheid.nl, the city of Amsterdam, the Ministry of the Interior and Kingdom Relations, Universities (open data), Employee Performance Unit Information, and Open State Foundation.
Denmark: the Danish Agency for Digitisation

This report is the main output of the project. The project has produced one main report and one technical report where the research is broken down by country (Technical Country Report).

This report summarises the results of research into the legislative, policy, regulatory and operational enablers utilised in selected comparative advanced jurisdictions as identified in the Open Data Barometer which promote Open Data, a culture of data sharing and that can help inform future strategic developments within NSW.

The report is of a practical nature and is designed to further discussion on Open Data to help promote and support an Open Data enabling culture among the NSW government agencies. It is not intended to provide a comprehensive examination of policy or legislative frameworks.

The report draws on a number of sources:

- country analyses that address legislative, policy and regulatory mechanism utilised in selected jurisdictions
- the knowledge of the author and drafting team of contemporary international approaches
- advice and inputs from the IPC, Steering Committee and other advisors.

Open Data is a fast-moving area with new programs, policies and legislation emerging globally. The research in this **Report is current to March 31, 2017. The Report was finalised in May 2017.**

While every effort has been made to establish as comprehensive as possible an understanding of Open Data in the various countries, in a limited study such as this the picture is bound to be partial and time-bound. In particular, the researchers were not commissioned to undertake a thorough 'ground up' desk review and analysis of each jurisdiction's situation and rely on the inputs of local key informants. The advantage of this approach is to add context and insights to the institutional outline. An inevitable disadvantage is that the material and information provided reflects the perspective of the informants. They have therefore been used as one input to the broader analysis of enablers presented in the First Report and weighed alongside the author's knowledge of the country's Open Data status, inputs from the IPC and feedback from the Steering Committee.

Acknowledgements

We are indebted to the invaluable contributions by organisations in overseas jurisdictions that communicated with us to provide their views on Open Data initiatives in their countries. We are grateful for the guidance and expertise of members of the Steering Committee. We are equally grateful to the Information and Privacy Commission for their contribution and insight provided for the report.

Authorship

Report on Conditions Enabling Open Data and Promoting a Data Sharing Culture
Dr. Alana Maurushat

Technical Country Reports on Enabling an Open Data Culture

- **United Kingdom Country Report**– David Vaile and Dr. Alana Maurushat
- **United States Country Report**– Dr. Frank Smith
- **Canada Country Report** – Suzanne Palko and Dr. Alana Maurushat
- **France Country Report**– Othmane Mechette and Dr. Alana Maurushat
- **New Zealand Country Report**– David Vaile

- **Netherlands Country Report**– Dr. Hadeel Al-Alosi and Dr. Alana Maurushat
- **Sweden Country Report**– Professor Dan Svantesson
- **Denmark Country Report**– Dr. Jan Trzaskowski
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PART 3: Defining and Measuring Open Data and its Impact

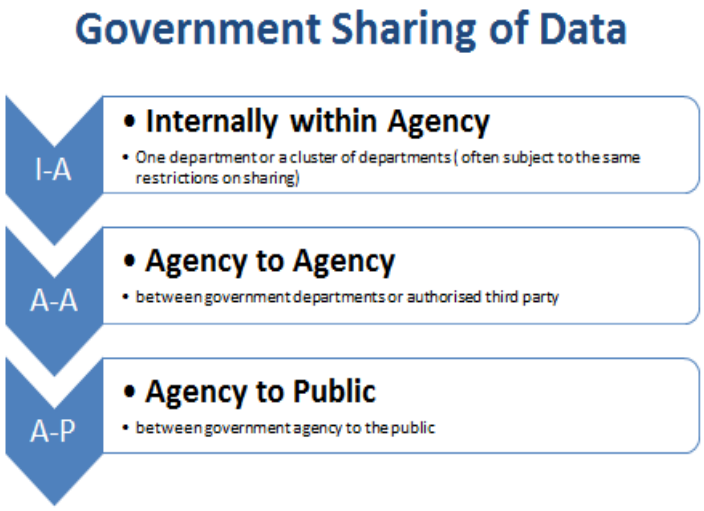
Key Terms

Open Data is data that can be used, shared and built-on by anyone, anywhere, for any purpose (Open Knowledge International https://okfn.org/projects/open-definition/)

Open Government Data is:

- Data produced or commissioned by government or government controlled entities.
- Data which is open as defined in the Open Definition – that is, it can be freely used, modified, and shared by anyone for any purpose (subject to requirements that preserve provenance and openness) (Open Government Data at https://opengovernmentdata.org).

These definitions are important in that often there are misconceptions about information sharing and Open Data. For example, if an agency does not allow the data to be used in a commercial application, or if an agency is charging for the data, this is not Open Data. Some data for reasons of privacy, security, and commercial sensitivity has restrictions on it and how it is shared. However, integral to this report is recognition that not all data constitutes Open Data from creation and to progress the Open Data agenda enablers that facilitate the transformation of data to Open Data are required. This approach is recognised in the enablers identified in all leading jurisdictions.



Under the definition of Open Data and Open Data, data is only truly open when it is available to be accessed, used and shared in ***all*** of the above ways. An additional aspect that is increasing in importance is the use of external non-government organisations to provide services on behalf of government. In these cases there may also need to be appropriate legislative and policy frameworks supporting the flow of information from those providers to agencies.

There are many projects and indexes looking at Open Data but not all are directly relevant to this report.[21] This report considers six different measures but relies primarily on the work of three

[21] *Open Data 500 Global Network* and the *Govlab Index on Open Data* study and compare companies' use of Open Data and track open data companies with the goal to "improve people's lives by changing how we govern, using technology-enabled solutions and a collaborative, networked approach". The *World Justice Project Open Government Index* measures government openness based on publicized laws and government data, right to information, civic participation and

different measurements of the extent to which jurisdictions have implemented Open Data. These are: *Open Data Barometer (2015)*, *Global Open Data Index (2015)*, and *OECD OURdata Index on Open Data (2014), whether a signatory to the International Open Data Charter, the World Justice Open Government Index and membership of the G8 Open data Charter (2013)*.

Open Data Barometer (ODB) is an expert assessment system that is scored by peer-reviewed local expert survey, a government self-assessment via a simplified survey and secondary data selected to complement the surveys to assess 'Readiness' portion of the assessment (data from the World Economic Forum, World Bank, United National e-Government Survey and Freedom House). Open Data initiatives are assessed by:

- *Readiness:* How prepared are governments for Open Data initiatives? What policies are in place?
- *Implementation*: Are governments putting their commitments into practice?
- *Impact:* Is Open Data being used in ways that bring practical benefit?

ODB is assessed across fifteen types of datasets: map data, land ownership, national statistics, detailed budget, government spend, company register, legislation, public transport timetables, international trade, health sector performance, primary or secondary education performance, crime statistics, national environment statistics, and national election results. **ODB is the only study that assesses impact.**

Global Open Data Index (GODI) is a crowd-sourced indicator of the openness of government datasets where information is gathered through the Open Data Census. The index is produced by the Open Knowledge Foundation and relies on contributions from civil society members and Open Data practitioners globally (through non-probability sampling technique – 'snowball sample'). Any member of the public may contribute to the index which is later peer-reviewed and checked by a team of expert country editors, and lastly there is a public review.

The Index relies on the assessments of ten types of datasets: government budget, company registers, election results, emissions of (air) pollutants, legislation, national map, postcodes, government spending, national statistics, and transport tables.

OECD OURdata Index on Open Data (OECD OGD) is an indicator produced by the OECD that uses both an ex post and ex ante analytical framework for OGD initiatives around a related set of data in order to map initiatives across OECD countries. The common set of metrics can then be applied to assess the impact and value created from Open Data. Open Data is analysed in three critical areas – openness, usefulness and re-usability.

The index includes analysis of nine types of datasets: business information, registers, patent and trademark information, public tender databases, geographic information, legal information, meteorological information, social data and transport information.

International Open Data Charter was established in 2015 and builds on the G8 Open Data Charter, signed by G8 leaders in July 2013. The Charter is a collaboration between governments and data experts, and is underpinned by six principles to improve the access, release and use of data:

- open by default
- timely and comprehensive
- accessible and usable
- comparable and interoperable
- for improved governance and citizen engagement
- for inclusive development and innovation

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complaint mechanisms. The scores and ranking draw on 78 variables derived from over 100,000 surveys and expert questionnaires for each country.

World Justice Open Government Index (WJ Open Government Index) is an indicator of government openness based on four dimensions: publicised laws and government data, the right to information, civil participation and complaint mechanisms. The scores and rankings come from household surveys (over 100,000) as well as in-country expert questionnaires. The index provides the "perspectives of ordinary people as they interact with their governments."

The Global Right to Information Ratings (GIIR) is a program which comparatively assesses the strength of legal frameworks for the right to information from around the world which is based on 61 indicators. The rating measures the legal framework based on clusters of indicators: Right of Access, Scope, Requesting Procedures, Exceptions and Refusals, Appeals, Sanctions and Protections, and Promotional Measures. A pilot application was conducted to test the framework, as well as looking at international standards and comparing them to countries right of information laws. Many of the local experts have a background in journalism and/or privacy. The ratings measure the legal frameworks; they do not measure their implementation, how they function in practice, or their impact.

G8 Open Data Charter was signed by the G8 leaders on 18 June 2013. The Open Data Charter sets out five strategic principles that all G8 members will act on. These include an expectation that all government data will be published openly by default, alongside principles to increase the quality, quantity and re-use of the data that is released. G8 members have also identified 14 high-value areas – from education to transport, and from health to crime and justice – from which they will release data.

Indicative Performance of Jurisdictions by Open Data Measures'

Country	Open Data Barometer 2015	Global Open Data Index 2015	OECD OURdata Index on Open Data 2014	International Open Data Charter (Oct. 2016)	WJ Open Government Index 2015	Global Right to Information Sharing 2015	G8 Open Data Charter 2013
United Kingdom	1	2	3	Yes	8	34	Yes
United States	2	8	9	No	11	57	Yes
France	2	10	2	Yes	17	95	Yes
Canada	4	17	5	No (City of Edmonton - Yes)	7	49	Yes
Denmark	5	3	19	No	4	93	
New Zealand	6	NA	15	No	2	41	
Netherlands	6	8	25	No	5	63	
Sweden	9	27	27	No	1	45	
Australia	10	5	4	No*	9	58	

(Note: Australia adopted the International Open Data Charter in March 2017
The OECD index was only published for the year 2014.)

France is noticeable in its rank change from 2013 to 2015 in the ODB (up 8 ranks) and is the only other country surveyed to also adopt the International Open Data Charter; they have adopted the G8 Open Data Charter as well.

Canada has adopted the G8 Open Data Charter and the City of Edmonton, Alberta, has adopted the International Open Data Charter.

Australia made ranking improvement of 1 from 2013 to 2014 and then 0 ranking improvement from 2014 to 2015. It adopted the International Open Data Charter in March 2017.

This table highlights the leadership of the United Kingdom. It is the only country to score in the top five across these first three Open Data measurements. They were also one of the original adopters of the International Open Data Charter 2015 and the G8 Open Data Charter 2013. The United Kingdom is also the only country to Score 100 in Readiness, Implementation and Impact (ODB). As a result, this report focuses more heavily on the UK than other jurisdictions.

Measuring progress toward Open Data and its impact

As the Sunlight Foundation has found, evidence of the progress and impact of Open Data initiatives is incredibly scarce. As this research has found, identifying the direct impact of Open Data initiatives is not evident in direct causal relations. The fields of Open Government and Open Data are relatively young, making it even more challenging to measure their direct impact. [22.]

Nevertheless, recent developments include new tools that will assist future research in this area. The Centre for Public Impact, a not-for-profit foundation funded by The Boston Consulting Group has developed a framework that sets out how government can improve the results it achieves for citizens. In March 2017, the Centre proposed the Public Impact Gap as a measure of the difference between the outcomes a government is achieving and the outcomes it could be achieving.

> "*It works by comparing a government's performance on a given outcome (for example, road traffic safety) to a stretching but achievable benchmark based on a group of peers. A country's Public Impact Gap tells us how far that country lags behind its peers, and also what impact could be achieved if the Gap were to be closed (for example, the number of lives that could be saved). While it is a relatively simple concept, …Highlighting where Public Impact Gaps exist is just the beginning of the story. The Centre for Public Impact has also set out the means to diagnose, address and close Public Impact Gaps by publishing the Public Impact Fundamentals – a free tool for governments, developed with leading academics to help leaders achieve better outcomes*"[23].

Measuring the impact of Open Data and Open Government is essential in determining whether new measures are achieving their goals, and having desirable impact. In some jurisdictions the opening of government data has been justified by expected economic benefits from increased efficiency and innovation within government. Open Data has also been justified as a political benefit of transparency and accountability of government. And as articulated above, one goal may also be to close public impact gaps. These are different goals which may require separate measurements.

Financial Benefit: One approach would be to commission a follow-up study on certain key open datasets after they have been opened for five years similar to the study undertaken by the Danish Government. The study assessed direct financial benefits from opening utilities, address data, the Land Registry and the Central Business Registry and found that it cost two million EUR to open the data, but that the direct financial benefits from 2005-2009 were 62 million EUR.[24]

Open Government (transparency and accountability): One approach to consider would be to review the current suite of Open Data assessment frameworks (described in Part 3) and apply them to the NSW context. As an example, the criteria and questions used in the Open Data Barometer[25] could be

[22] http://www.opendataresearch.org/dl/symposium2015/odrs2015-paper20.pdf

[23] https://publicimpact.blob.core.windows.net/production/2017/03/5382-CPI-Gap-Report-NEW-singles-AW.pdf

[24] McMurren, J., Verhulst, S. and Young, A., Denmark's Open Address Data Set: Consolidating and Freeing up Address Data (January 2016) available at http://odimpact.org/static/files/case-study

[25] **Open Data Barometer (ODB)** is an expert assessment system that is scored by peer-reviewed local expert survey, a government self-assessment via a simplified survey and secondary data selected to complement the surveys to assess 'Readiness' portion of the assessment (data from the World Economic Forum, World Bank, United National e-Government Survey and Freedom House). Open Data initiatives are assessed by:

used to set an initial benchmark for NSW and track progress. Another approach would be to use the OECD Open Data criteria to conduct a review of the current maturity of Open Data approaches, using a similar methodology used in recent OECD Open Government Data reviews of Poland and Mexico.[26] These methods measure Open Data from the perspective of leading to transparent and accountable government; they do not measure financial benefits and efficiencies that are derived by Open Data.

Ideally NSW would adopt a measurement system or systems that measured both efficiencies saved, and the implementation and impact on transparent and accountable government.

Readiness: How prepared are governments for Open Data initiatives? What policies are in place?

Implementation: Are governments putting their commitments into practice?

Impact: Is Open Data being used in ways that bring practical benefit?

ODB is assessed across fifteen types of datasets: map data, land ownership, national statistics, detailed budget, government spend, company register, legislation, public transport timetables, international trade, health sector performance, primary or secondary education performance, crime statistics, national environment statistics, and national election results.

[26] See http://www.oecd.org/gov/open-government-data-review-of-mexico-9789264259270-en.htm for the report on Mexico.

PART 3: Enablers Based on Country Analysis

Overview and approach to enablers

The project's Terms of Reference described the outcomes of the project to:

> …identify and describe 5-8 legislative policy and regulatory mechanisms used in comparative jurisdictions to promote and support Open Data and a culture of data sharing, together with 10-15 examples of the outcomes for these conditions.

Our team looked at eight national jurisdictions, two state/provincial, two council clusters and seven smart cities. These analyses are found in the supporting technical country analyses. The amount of information available for each jurisdiction varied, as did the response from communications with organisations. The enablers and exemplars are predominantly based on what we believe are the five leading jurisdictions – UK, US, France, Canada, and New Zealand - in Open Data based on:

- global rankings
- comprehensiveness at national, regional and local levels
- adoption of Open Data Charters
- culturally enabled Open Data (not just legislation)
- emerging trends and future plans

The project's Terms of Reference specified three broad areas that should be addressed. These included legislative, policy and regulatory. Following discussion with the project Steering Committee, analysis of country findings and subsequent discussions with the IPC the enablers are categorised as following:

- Legislative
- Policy
- Regulatory
- Leadership
- Culture and Collaboration
- Operational

Each enabler then has:

- A definition to explain what the enabler is.
- A description of why this enabler is important.
- Common approaches to the enabler.
- Some exemplars of specific actions taken in particular jurisdictions to illustrate how the enabler is used, and to provide possible insights to applying the enabler in the NSW government context. Exemplars will be either ones that contribute to an Open Data environment, or those that are a result of enabling Open Data.

Insights regarding Enablers of Open Data

Leadership

The leadership enabler incentivises and sets the tone for Open Government and Open Data. This includes:

- Public support for Open Data by governments, ministers and agency heads.
- Actions by governmental leaders to encourage the release of data and a change in the attitude toward government data that favours sharing and release.

- Establishing processes and mechanisms that mandate data release and demonstrate this support.
- Establishing processes to identify strategic datasets to be opened that will drive economic interests.

This enabler is important because it demonstrates to agencies, their ministers and staff that it is desirable to release data, in effect giving not just permission but encouragement. It also helps drive decision-making towards a 'pro release' outcome. This enabler works with the policy and culture enablers to support Open Data.

From the research, putting this enabler into practice includes:

- Nominating Open Data champions inside government.
- Information access agencies with a clear mandate to support Open Data (eg. the UK Information Commissioner's Office).
- Ensuring a lead 'line agency' (ie. not regulatory) such as the New Zealand Department of Land Information (LINZ) who host the key Open Data program and whose CEO holds the position of Government Chief Information Officer to ensure operationalisation of the Open Data agenda.
- Encouraging stakeholder involvement in key projects (Eg. Open Data Initiative in the UK).
- Establishing a clear policy mandate for Open Data from the top, such as through:
  - public commitments to Open Data
  - the Prime Minister/President/Premier directives to ministers and agencies via — 'Ministerial letters' or similar mechanisms (eg. Obama).
- Adopting or supporting international agreements such as the Open Data Charter.
- Ensuring legislative structures are complemented and reinforced by policy directions from the centre, for example via Cabinet Office level directives and guidance.
- Connect the Open Data drive with other, related priorities such as:
  - Open Government.
  - Innovation.
- Data Analytics to deliver policy.
- Actions to address community concerns about Open Data (see the Culture enabler).

EXEMPLARS / ENABLERS IN ACTION

ENABLERS CONTRIBUTING TO OPEN DATA

Ministerial Letters or Equivalent – President Obama

On his first day in office, President Barack Obama sent a Memorandum for the Head of Executive Departments and Agencies on Transparency and Open Government. The Memo commits to establishing "an unprecedented level of openness in Government," and argues that government should be transparent, participatory, and collaborative.

Other world leaders followed suit issuing their own Ministerial Letters or equivalent such as Prime Minister David Cameron's Ministerial Letters of 2010-2012.

Leadership Across All Levels of Government

Open Government and Open Data leadership in Canada has been at the national and sub-national levels. Ministerial letters and equivalent mandates were issued by the Prime Minister, Premier of Ontario and the Mayor of the City of Toronto. All levels of government encourage information sharing and open by default internally with an agency, agency to agency, agency to public, and between local, provincial and national agencies as well.

Adoption or Endorsement of International Open Data Charter (IODC)

The UK and France have formally adopted the IODC while Canada and New Zealand have endorsed and have structured their National Action Plans/Declaration around the principles and goals of the Charter. (Australia adopted the IODC in March 2017.)

EXEMPLARS AS A RESULT OF OPEN DATA

A Culture of Leadership

Communications with the UK, Canada, US and France emphasised the role that leadership in setting the tone and encouraging ministers, department heads, CEOs and mayors in the move towards Open Government and Open Data.

In the UK and US significant leadership came from civil society (Sunlight Foundation) and the President/Prime Minister which initiated Open Government and Open Data.

In France (City of Rennes) and Canada (Province of Ontario), significant leadership at the sub-national levels have facilitated improved action at the national levels.

INSIGHTS — PRIORITY ENABLERS CONSIDERATION FOR NEW SOUTH WALES

- **The NSW Government adopt the International Open Data Charter consistent with the Commonwealth Government's recent adoption as part of implementing the Open Government National Action Plan.[27]**
- **A public letter/directive from the Premier to Ministers mandating that their departments implement (where possible) the accountability, transparency and related principles of Open Government and Open Data, including the creation of Open Datasets in machine-readable format.**
- **Champion and where relevant adopt national and international Open Data agendas that balance Open Data and data protection factors such as the EU Data Protection Regulation approach and current developments including the Productivity Commission's examination of Data Availability and Use.**
- **As few foreign jurisdictions have yet explicitly measured the impact of their Open Data initiatives, NSW has an opportunity to demonstrate global leadership by requiring qualitative and quantitative impact measurements for all Open Government and Open Data initiatives.**
- **Support cross-sector collaborations (similar to the New Zealand Data Futures partnership) to drive trusted data use in NSW, leveraging the role of the Data Analytics Centre in particular.**
- **Ensure that all new initiatives using or creating significant data include consideration of Open Data principles.**

Legislation

Legislative enablers provide a directive framework from government setting rights and responsibilities. In this context, it would include law making for:

- An authorising legislative environment and/or greater utilisation of existing legislative enablers including the 'public interest test'.

[27] https://blog.data.gov.au/news-media/blog/australia-adopts-international-open-data-charter

- Rights for sharing and accessing digital information and, in the context of Open Data, clear definitions to promote protection of data and sound regulatory guidance together with broad regulatory oversight.
- Obligations and duties on data custodians (including data protections and privacy principles).
- Right to re-use machine-readable data.
- Recognition of a gradated approach to data management that supports Open Data and data sharing through balancing and protecting of other rights including privacy.
- Legislated priorities to facilitate direction of resources.
- Facilitate data sharing between stakeholders.

This enabler is important because it provides the basis for agency decision-making and it creates positive transparent obligations and duties. A legislative framework ensures that information is accessible and that rights will be protected and holds agencies accountable to deliver legislative goals. It is important to consider whether changes should be made to existing legislation as well as introducing new legislation to support Open Data.

Common approaches in the research indicate that putting this enabler into practice includes legislation that address:

- open by default
- rights to request information
- rights to Public Sector Data - government data in machine-readable format (and often in an international open standard – see UK and France)
- rights to have a decision reviewed.

Legislative reform has also been directed to changing existing regimes as well as adding additional, Open Data elements. The example of opening up medical data is discussed below.

The different existing legislative settings in jurisdictions will affect the Open Data agenda and this diversity is emerging internationally as well as in Australia.

EXEMPLARS/ENABLER IN ACTION

ENABLERS CONTRIBUTING TO OPEN DATA

The UK, US, France, and Ontario (sub-national level) have **legislated Open by Default**.

In the UK the *Freedom of Information Act* and its s. 45 Codes of Practice create a **'right to data'** comprising new duties for certain public authorities to provide datasets of factual management information **in a re-usable form (machine-readable based on open standards**) and with a licence permitting re-use, in response to requests, and to continue to publish them. The Information Commissioner has also provided clear guidance to support the release of data, for example clarification that data protection law does not apply to data that has been anonymised.

Bundling of legislation to Mandate Open Data

In the US the Federal legislative framework evolves around the *Digital Accountability and Transparency Act 2014* (DATA Act) and the *Making Open and Machine-Readable the New Default for Government Information, Executive Order 13642*, the *Open Government Act 2007* and *the Freedom of Information Act.* The Executive Order (EO) mandates open by default for new and modernised government information. It is important to note that the title of the EO includes the term 'machine-readable'. This resonates with the US viewpoint that opening data is only the first step. **Advancing a data-driven government and economy requires Open Data, machine-readable format,** with the legislative framework and sufficient resources to utilise big data analytics.

United Kingdom's Digital Economy Bill 2017

The UK Digital Economy Bill has a number of aims, one of which involves data sharing of personal

(and sensitive) information. The Bill introduces data sharing not only amongst government agencies but expands this to researchers and the private sector. There are a number of clauses that provide **permissive gateways that allow specified persons/organisations to share information with other specified persons/organisations for the purpose of a specified objective.** Specific objectives include:[28]

- public service delivery
- civil registration
- debt
- fraud against the public sector
- research in the public interest
- revenue and customs
- statistics

It is uncertain if the Bill will pass and be formalised into law. However, the Bill has progressed significantly. At present the Bill is subject to referral between the two Houses and there has been criticism of the Bill, in particular around privacy concerns. Frameworks that allow increased data sharing between the government and private sectors will require careful consideration if adopted in other jurisdictions.

Supporting regulations in the EU General Data Protection Regulation

The European Union (EU) General Data Protection Regulation (GDPR) was approved by the EU Parliament on 14 April 2016 and commences operation through a two year transition period with full implementation and enforcement from 25 May 2018.

The GDPR replaces the Data Protection Directive 95/46/EC and was designed to harmonize data privacy laws across Europe. The primary objectives of the GDPR are to empower citizens in respect of their personal data and simplify the regulatory environment for international business by unifying the regulation within the EU. The GDPR applies to all companies processing and holding the personal data of data subjects residing in the European Union, regardless of the company's location. Accordingly the GDPR will impact globally.

The United Kingdom (UK) has established an operating model that achieves the objective of balancing information access and data protection. The Information Commission's Office (UK OIC) has regulatory oversight and advocacy responsibilities under both the *Freedom of Information Act 2000* and the *Data Protection Act 1998*. To implement the GDPR the OIC issued guidance on consent which recognises that consent is only one of the lawful bases contained under the GDPR. The Guidance provides the following additional bases:

- a contract with the individual
- compliance with a legal obligation
- vital interests
- a public task
- legitimate interests.

Open Sensitive Healthcare Data

The French have mandated that even data as sensitive as health data be opened in the *Healthcare*

[28] United Kingdom Digital Economy Bill Explanatory Notes (July 5 2016)

Data Legislated as Open Act (2016). They are confident in their de-identification techniques, standards, support and training and see more advantages to allowing medical data for re-use as opposed to the possibility for misuse. This highlights that Open Data approaches can be used in even relatively sensitive areas and may benefit from specific legislative frameworks.

EXEMPLARS AS A RESULT OF OPEN DATA

The INSPIRE Directive[29] of the European Parliament obliged European Union members to open their spatial data amongst other obligations related to spatial data infrastructure. OPENDefra was the product of this initial European Directive coupled with a direct Ministerial mandate to open 8,000 datasets. OpenDefra is a collaboration of internal and external participants (eg. Open Data Institute) who were able to release over 11,000 datasets in 18 months (8,000 specific datasets were mandated to be opened by the Cabinet Office). Our communications with the UK suggests that the big catalyst to opening the data came from the realisation that the data had potential uses and engaged users outside of the Department. Mandating a quota of datasets to be opened within a specified time-frame meant that collaboration was initially forced but led to genuine long lasting collaboration and expertise sharing, and the culture of data sharing. **OPENDefra is used as the key case study in the UK to encourage data sharing and Open Data amongst other agencies.**

INSIGHTS — PRIORITY ENABLERS CONSIDERATION FOR NEW SOUTH WALES

The importance of the legislative enabler was shown in NSW with the establishment, in 2015, of NSW Data Analytics Centre (DAC). This was an Australian first — a whole-of-government approach using data analytics to tackle some of the State's most difficult policy challenges. To support the work of the DAC the NSW Government passed ground-breaking legislation, allowing 160 government agencies and 152 council areas to share their data with the NSW DAC. Integral to this work is the safeguarding of sensitive data by making data anonymous, confidential, and secure, and complying with 50 pieces of State legislation. The NSW DAC model is now being copied in other states.
In the NSW legislative environment the *Data Sharing Act (2015)* operates in the context of existing information access and privacy legislation.

This contrasts with the legislative environment in South Australia which modelled a *Public Sector (Data Sharing) Act 2016* on the NSW approach but without existing privacy legislation or a modern information access regime. The SA legislation takes a different approach by incorporating privacy and a public interest test for sharing in the Trusted Access Principles that govern the provision of information. The Trusted Access Principles promote the objects of the Act at section 4 which clearly articulate the purpose of the Act to ensure the management and use of public sector data as a public resource that supports good government policy making, program management and service planning and delivery and facilitate the expeditious sharing of public sector data between public sector agencies. This approach confirms the purpose of data sharing and recognises the responsibilities of data providers to release of public sector data outside the public sector under the *Freedom of Information Act 1991.*

This approach provides an authorising environment to facilitate both Open Data and data sharing more broadly. Measures to provide safeguards are applied to facilitate data sharing and accordingly they do not impede the overarching objectives of data sharing. Nonetheless, there are still other legislative options that have not been explored in NSW. These are:

- **Identify and examine contemporary legislative approaches to Open Data and information**

[29] Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

sharing with a particular focus on the objectives of simplifying and harmonising the personal data regulatory environment for businesses and governments, and providing data protection rights for individuals.

- **Examine the extant legislative environment in NSW to identify existing 'public interest' test mechanisms that balance data release and ensure appropriate safeguards together with opportunities to strengthen the legislative environment by consolidating and clarifying rights and responsibilities for government entities, business and citizens.**
- **Consider the authorising environment for Open Data including moving from a legislative framework that authorises data release to one that mandates pro-active data release and making datasets open in machine-readable format if there has been a successful right to information request.**

Policy

The policy enabler provides a direction or principle for action and decision making to meet defined objectives. The objectives may be achieved in a variety of ways tailored to a department's or agency's environment. In the context of government data, policies may be directed at specific datasets such as geo-spatial data, or at datasets with certain attributes, and such as datasets containing personal information which require de-identification of the information prior to release. This includes setting policies that:

- State government intentions and expectations to guide agency and staff decisions and priorities, particularly in how to stimulate Open Data and balance or integrate data and privacy perspectives.
- Ensure there is an appropriate suite of regulatory guidance on more detailed issues such as diverse as anonymisation, data security, privacy, data minimisation, data sharing, organisational approaches to data.
- Provide authoritative implementation guidelines, measurements and methodologies to assess impact.
- Set the goals and boundaries for collaborative engagements.

This enabler is important because policies help interpret legislation, and add additional details which often provide high level principles and methods used to achieve goals. Policies are able to set priorities where legislation may not be appropriate, particularly where circumstances are rapidly changing.

Policy is used as an enabler to achieve Open Data. Data can also be a policy enabler, especially where goals are related to increased efficiencies, and improved accountabilities. Policy and data are sometimes described as dually enabled.

Common approaches to enable Open Data are policies that:

- Develop open government action plans that encourage:
    - open by default
    - pro-active release of data
    - privacy by design
    - outline key priorities for each Ministry
- Articulate that Open Data is part of a larger picture of:
    - open government
    - fiscal transparency
    - innovation
    - improved data collection, use and efficiencies to drive evidence-based decision making.

EXEMPLAR/ENABLER IN ACTION

ENABLERS CONTRIBUTING TO OPEN DATA

Leading jurisdictions have developed concrete **National Action Plans** which provide leadership and guidance on the principles of Open Data and Open Government as well as guidance and responsibility for implementation (UK, US, Canada, and France).

Lead jurisdictions have **Open Data Principles or Charters** (UK, US, France, Canada and New Zealand)

The UK's Public Sector Transparency Board: Public Data Principles contain three unique principles that reinforce the importance of Open Data and how it is to be implemented:

- Public data policy and practice will be clearly **driven by the public and businesses that want and use the data,** including what data is released when and in what form.
- Public data will be published using **open standards, and following relevant recommendations of the World Wide Web Consortium.**
- **Release data quickly**, and then work to make sure that it is available in open standard formats, including linked data forms.

Three Pillars of Open Data

The province of Ontario and the Municipalities within Ontario (eg. Toronto) have adopted a three pillar strategy of **Access by Design, Privacy by Design and Open by Default.**

Inventories as Key Initial Step

Lead jurisdictions have Data Catalogues which are a comprehensive inventory of datasets including both open and restricted datasets. Making an inventory of datasets is seen in leading jurisdictions as a key initial first step to the path of Open Data.

EXEMPLARS AS A RESULT OF OPEN DATA

Complete Catalogue of Open, Restricted and Closed Datasets - Ontario Data Catalogue

Ontario has an Open Government project tracker that allows the public to see the stage a project is at including whether in planning, complete and implementing. Completed projects at this stage are largely policies and mandate letters, with crowdsourcing, data inventory and Open Government consultation underway. Restricted and closed datasets are also listed. The public list has allowed developers to see what types of datasets exist. They can then initiate a Freedom of Information request to access the dataset (if it is not already open).

INSIGHTS — PRIORITY ENABLERS CONSIDERATION FOR NEW SOUTH WALES

- **Consider developing an integrated policy approach unifying Open Data and privacy dimensions to provide a single path for considering release, rather than separate.**
- **Develop a standardised "Open Government License" that is compatible with the Creative Commons License.**
- **Consider mandating departments to open specific datasets, as well as a quota of datasets compelling forced collaboration. This method has proven highly effective in the UK. Regional NSW has a strong economy based on industries such as biotechnology, renewable energy, mining, fishing and agriculture. Datasets impacting on these industries should be considered for prioritisation in open machine-readable formats.**
- **Mandate departments to create machine-readable standardised formats for datasets**

which allows for analytics and linked data applications.

- **Mandate metadata standards (preferably an international metadata standard) for all datasets, licenses and machine-readable formats, with datasets to be released on the NSW Portal.[30]**
- **In situations where there has been a successful right to information request, mandate pro-active open release of those datasets in machine readable format.[31]**
- **Develop policies reflective of an anticipatory approach to harm minimisation and regulation generally.**

Regulatory

The regulatory enabler provides authoritative and enforceable rules with an expectation of compliance to prevent harms or improve outcomes. It includes regulatory action to:

- Inject certainty and provide guidance to government agencies in meeting their obligations and expectations under what can be complex legislation and policy frameworks.
- Promote and enforce rights to data and balance appropriate restrictions including privacy.
- Support or sanction behaviour.
- Give effect to legislation with information and other tools to ensure conduct consistent with legislation.
- Implement systems and approaches that facilitate an anticipatory regulatory approach to ensure risk identification, classification and appropriate mitigation/remediation strategies are identified and developed.
- Provide tangible pathways for oversight, review and redress.

This enabler is important because it demonstrates that the exercise of rights and obligations in legislation and policy are monitored, supported and enforced.

From the research, putting this enabler into practice includes:

- Appointing Chief Information Officers was considered essential (UK, USA, Canada, France, Denmark, Sweden, the Netherlands, and many of the cities).
- Clear guidance that provides assurance to agencies that, if followed, decision-making is sound and based upon regulatory guidance that promote responsible and balanced data release including existing mechanisms such as the 'public interest test' established under the GIPA Act.
- Robust monitoring arrangements to assess delivery of rights to information and obligations of data custodians.
- Provide independent review of decisions and complaint handling.
- Encourage privacy impact assessments of datasets that like the UK OIC approach adopt a balanced risk based approach to privacy considerations
- Encourage the management of data quality assurance through disclosure of inaccuracies and limitations of datasets.

[30] NSW agencies are encouraged currently to 'release better data in accessible, consumable formats with metadata and quality statements' … 'release data faster using automated processes, standard data categories and trusted user models'… and 'release more data and make it discoverable through central portals' (2016 NSW Open Data Policy).

[31] This is the similar to the United Kingdom, United States and French approaches.

EXEMPLAR/ENABLER IN ACTION

ENABLERS CONTRIBUTING TO OPEN DATA

In most countries **right to information** regimes (which include significant regulatory structures to oversee rights to review decisions) provide the initial and main conceptual basis for Open Data.

In European countries the right to information regime is complemented by **a right of re-use of public sector data** which forms the conceptual basis for Open Data, and re-useable data in machine-learning and standardised formats.

The UK ICO issues **Guidance on Anonymisation**: **Managing Protection Risk 2012**. The ICO has supported the UKAN initiative. UKAN is the UK Anonymisation Network comprised of experts from universities, the Open Data Institute and the Office for National Statistics that supports practitioners to discuss anonymisation issues and share best practice.

In the UK, the **Information Commissioner's Office enforces rights to data and is able to take complaints.** The ICO also approves publication schemes (schemes identify open datasets and registries) of public authorities, assessing good practice, imposing fines for non-compliance, recommending information including datasets to be opened, prosecute those who commit criminal offences under the *Freedom of Information Act*, and by hearing appeals.

New roles are appointed based on needs for sensitive information such as the recent appointment of a **UK Surveillance Camera Commissioner** also responds to the need to oversight the collection, storage and management of digital images.

In NZ a decision about the right of information may be reviewed and appealed by the Ombudsman.

Use of tools such as Privacy Impact Assessments to integrate consideration of privacy and Open Data.

Chief Information Officers (CIOs)

Research and communication with jurisdictions indicated that CIOs or equivalent were essential to effectively championing and delivering Open Data. The roles of CIOs vary from jurisdiction to jurisdiction with some having responsibility and are accountable for delivering Open Data, while other jurisdictions the role focused more as a facilitator and cultural driver. In Canada the CIO office of the Treasury Branch is delegated the role of ensuring compliance with Open Government and Open Data policies.

EXEMPLARS AS A RESULT OF OPEN DATA

Privacy Impact Assessments

National Family Food Survey

The National Family Food Survey conducted a privacy impact assessment which has later been used as an example of a model approach.

The PIA recognised that the UK Office of the Information Commissioner (OIC) made clear that data protection law does not apply to data that has been anonymised. The OIC Anonymisation Code of Practice was the starting point and re-identification was considered in the context of this guidance which requires assessment of the risk of harm resulting from any re-identification. DEFRA determined that any re-identification would not reveal 'sensitive' information that would impact on individuals and government that would warrant additional restrictions. A privacy impact assessment was performed, published and there is a version open to public comment for the PIA to provide feedback for current and future use. The PIA is considered to be a model for future opening of

datasets containing confidential personal information**. Additionally the UK Information Commissioner has recommended the establishment and maintenance of a log recorded as a dataset of issues arising from PIAs.** The log is then used to record, track and report on the operation of PIAs to assist organisations in identifying and minimising the privacy risks of new projects or policies. This approach enables Open Data and a sound anticipatory regulatory approach, promotes a culture of trusted openness, shared success and collaboration.

INSIGHTS — PRIORITY ENABLERS CONSIDERATION FOR NEW SOUTH WALES

- **Champion and showcase model Privacy Impact Assessments for Open Data that reflect a balancing of risks and overall benefits of data release based on the authority provided in regulatory guidance.**
- **Include an anticipatory regulatory approach that promotes Open Data but ensure ongoing evaluation and assessment of security and privacy risks.**
- **Examine existing legislative mechanisms that provide greater regulatory certainty, for example promotion of the 'public interest' test established**
- **Develop in-depth guidelines on Anonymisation and De-identification that, like those issued by the UK OIC consider a balanced approach to the risk of harm resulting from any re-identification.**
- **Consider developing improved and in-depth guidelines on anonymisation and de-identification.**
- **Consider establishing a network similar to UKAN to share best practice and solve anonymisation problems.**

Culture and Collaboration

The culture and collaboration enabler includes:

- Actions within government to support Open Data and influence agency and staff attitudes.
- Actions outside government to support and promote Open Data availability and utilisation.
- Actions to engage the community in the Open Data agenda, elevate understanding and address concerns.
- Cultivation of wider horizontal sharing between international, national and sub-national levels of government, and with the greater public including external stakeholders within and outside a jurisdiction (eg. the leading jurisdictions were also the most cooperative in sharing information and providing guidance for the purpose of these reports).

This enabler is important because it complements more formal legislative and policy/leadership enablers with a focus on human and organisational cultural factors that might affect the implementation of the Open Data regime. It relies on the leadership enabler to demonstrate to agencies, their ministers and staff that it is desirable to release data, in effect giving not just permission but encouragement. It also helps drive decision-making toward a 'pro release' outcome.

The research suggests that putting this enabler into practice includes:

- Relying on the leadership enabler to set the tone, and then work within agencies and communities to support implementation.
- Establishing strong collaborative ties with civil society (eg. the role of the Open Data Initiative in the UK, and the role of the Sunlight Foundation in the United States, Canada and UK).

- Supporting the community to engage, such as through consultation through a survey of priority of concerns (eg. NZ Social License).
- Encouraging flexibility and providing guidance on how datasets are delivered based on user feedback.
- Providing institutional support and recognition for effective collaboration (eg. awards, and regular workshops between different agencies and external stakeholders).
- Encouraging external stakeholders to test and evaluate open datasets.
- Encouraging ongoing public feedback on all aspects of Open Government and Open Data.
- Incubation of Open Data companies within government projects.

Based on the research, putting this enabler into practice includes:

- Developing common platforms and providing guidance on tools to use databases.
- Finding community champions.
- Ensuring a clear, accurate understanding within and outside of government of the Open Data and privacy regimes so decisions are informed by authority and well-based.
- Engaging all levels of government, including shared/horizontal connections.

EXEMPLAR/ENABLER IN ACTION

ENABLERS CONTRIBUTING TO OPEN DATA

Qualitative Dataset Quotas in Specified Timeframe

In the UK Prime Minister David Cameron issued Ministerial Letters (2010-2012) to every government department calling for greater transparency through specific commitments. One such letter to the Department for Environment, Food & Rural Affairs (DEFRA) mandated that certain datasets be opened (eg. LIDAR – the Environment Agency's 3D height data) as well as a certain quota of datasets be opened (8,000 datasets).

Broader Community Engagement – NZ Social License

New Zealand is using a crowd source method of developing policy around personal information and data used known as the Social License. The Social License is a partnership between New Zealanders and the government where people can contribute their thoughts on the contents of data guidelines.

Open Data Champions – NZ as robust and diverse collaboration

Civil society and non-government organisations like the Open Data Catalogue <http://cat.open.org.nz/>, the Open Data NZ Meetup <https://www.meetup.com/Open-Data-NZ/>, and Open Government Ninjas <http://groups.open.org.nz/groups/ninja-talk/> promote Open Data at the national and local levels, and there is some participation in government supported entities like the New Zealand Data Futures Forum, now the Data Futures Partnership.

Incubation of Open Data Companies – Leading Global Smart City of Rennes, France

The City of Rennes in France was the initial driver of Open Data in France (Civil society were the initial drivers in the UK and US).

A Study considers the city of Rennes to be one of the most advanced cities in Europe for Open Data. They have regular meetings between providers and re-users, and feedback channels. Networking between stakeholders is considered essential with incubation of Open Data companies directly in City projects.

Building Capacity for Regionalised and Localised Open Data

Code for America

The Code for America is a foundation backed by the private and public sectors who 'build open source technology and organise a network of people dedicated to making government services simple, effective, and easy to use.'

The Foundation selects 30 fellows each year to work with the Data Office in San Francisco to assist 10 American cities with Open Data projects. Because these projects are open source, they are also made public so that anyone can contribute to the open source project, not just the 30 fellows steering the project. The project has inspired other global initiatives including Code for Africa.

The Foundation has published an Open Data "playbook" based on its rich experience of working with sub-national authorities in the United States.

EXEMPLARS AS A RESULT OF OPEN DATA

Progress Reports to Incentivise – Sunlight Foundation Progress Report

Our communications with entities in the US and Canada referred to the Sunlight Foundation progress reports on how other jurisdictions were doing which helped to motivate the Open Data program so as to not fall behind the innovation pack.

New Zealand Data Futures Partnership

The Partnership is an independent ministerial advisory group created to make a positive impact across the data-use ecosystem, by bringing together a cross-sector group of influential individuals who can work together and provide a collective voice on data issues.

It has been mandated by Cabinet to engage with citizens, the private sector, and non-government organisations to help drive change across New Zealand's data-use ecosystem.

The partnership is funding a series of catalyst projects, providing advice on how to diagnose and fix data-use problems, and facilitate a conversation with New Zealanders.

INSIGHTS — PRIORITY ENABLERS CONSIDERATION FOR NEW SOUTH WALES

- **Consider ways to improve collaboration with the broader community around a range of potential issues such as New Zealand's 'Social License'.**[32]
- **Highlight examples and case studies of the benefits of Open Data to the community and within the public sector, including by encouraging participation in data events (eg. 'gov hacks') and communication story telling platforms/services such UKAuthority to promote the message and access to information and decision makers.**
- **Promote collaboration by setting a quota for open datasets.**[33]
- **Establish a network similar to UKAN (universities, Open Data Institute and the Office of Statistics in the UK) to share best practice and discuss and solve problems. Complement this with an Open Data Community of practice within the NSW Government.**
- **Explore ways to improve collaboration with Open Data companies and organisations such as pilot studies, external stakeholder involvement on boards, workshops, and data cafes**

[32] see http://datafutures.co.nz/our-work-2/talking-to-new-zealanders/social-licence/
[33] This method has proven highly effective in the UK.

including communication/media approach similar to UKA.

- **Consider and adopt policy and educational approaches that commit to and promote Open Data and a spectrum based approach to de-personalised data as distinct from other forms of data[34]**
- **Adopt an incubator model where either an Open Data company is embedded with an agency to co-develop ideas and applications on models, or engage with entities such as Code for Australia to bring in ideas and expertise.**

Operational

The operational enabler addresses the many challenges and support opportunities in the day-to-day process of making data open. It includes actions such as:

- Developing a greater capability in Open Data and an understanding of the legislative and operational enablers within government and between government and the private sector to manage and share Open Data.
- Developing strategies to fund Open Data
- Story sharing of successful programs and outcomes including establishing databases or repositories and engaged communities of private, public sectors experts, researchers and citizens.
- Demonstrating the value of data through identifying a need or a problem that could be solved with Open Data and/or better data.

This enabler is important because many barriers to open data lie in issues such as technology, communications and optimising delivery of data.

Common approaches to this enabler include:

- Initial funding for opening initial high-value datasets.
- Delivering Open Data through a common portal (national common portal, State/Provincial portals, and common smart city portal) and provide guidance on how to use datasets on portals.
- Following a mandatory international standard for metadata (eg. W3C.)
- Use Standard Licenses that are compatible with the Creative Commons License.
- Offers descriptions of datasets setting out clear limitations.
- Setting up expert fusion centres to assist with data analytics and Open Data.
- Regional Innovation Hubs to assist cities, councils and villages to deliver Open Data.
- Working with established agencies with experience in specific functions (eg. nominating the Department of Statistics or the Census Bureau to assist with de-identification).
- Clustering departments/agencies based on common goals.
- Offering training workshops for departments and agencies on:
  - the authority for open access and Open Data
  - de-identification and anonymisation
  - how to use tools when running analytics on Open Data
- National level support and training for sub-national levels including State/Province and for cities and councils.
- Offering workshop days with industry and developers to test and evaluate new datasets and platforms (eg. Amsterdam data cafes).

[34] https://understandingpatientdata.org.uk/sites/default/files/2017-04/Data%20vocabulary_Good%20Business%20report%20March%202017_0.pdf

- Conducting pilot studies .
- Publishing milestones, progress reports and dashboards.

EXEMPLAR/ENABLER IN ACTION
ENABLERS CONTRIBUTING TO OPEN DATA
Regional Innovation, Skills and Training Hubs *Regional: Data Mill North* Data Mill North publishers were created by Leeds City Council, and recently spun off and rebranded independently. Along with the Leeds Council and Innovation Lab, they are seen across the UK as the most innovative and progressive hubs of innovation. Now a regional publication hub and centre of expertise for the North England region. It needed a critical mass of staff, who are hard to support both in budget and retention, but which is impossible at the individual council level. It works over a large region in the North of England, joins various councils together, common resources, cross fertilisation, critical mass of different initiatives being worked up, coming on line, and going operational.
Funding Lead jurisdictions have invested in Open Data in two predominant ways: Chief Data Officers (see Regulatory) and seed funding for initial implementation costs. In the US in 2016 more than $80 million was requested for DATA Act implementation; $10 million was requested for pilot programs in the Department of Health and Human Services alone. Our communications with the city of San Francisco indicated that **the implementation of Open Data moved slowly at first then improved significantly with legislated funded roles for this task, and initial seed development money.** The experiences are similar in the UK and France.
Testing, Evaluation and Engagement The US has **designated the staff at Data.gov (Executive Branch)** to assist with agency implementation of Open Data including testing, evaluation and engagement as well as working with agencies to ensure that they understand the limits of statistical and analytical processes, especially as processes used to de-identify and re-identify evolve.
Pilot Studies, Progress Reports and Dashboards ***The US emphasises that data alone is not useful***. Success depends on engagement. Many US efforts have included pilot studies and experimentation as well as published milestones, progress reports and dashboards. The DataSF portal tracks the status of the dataset inventory, data plans and published datasets.
Open Data Champions The UK has identified 16 Open Data Champions drawn from local authorities who have demonstrated they are "…setting the standard in open data and transparency."[35] These test and evaluate datasets prior to release.
Standardised Licensing and International Metadata Standard Lead jurisdictions do not allow agencies to make and adopt their own licences, or determine their own metadata standards. The UK Re-use Regulations creates a specific OD driver requiring information be made available for reuse in machine readable format using Open Data standards

[35] https://data.blog.gov.uk/2015/03/24/open-data-champions/

(W3C) and by default, and the **Open Government License** (Ontario has adopted the UK's license and data standards).

All leading jurisdictions have licences that are compatible with the Creative Commons License.

EXEMPLARS AS A RESULT OF OPEN DATA

DATA USA – The Importance of Machine Readable Linked Open Data

Because the Federal Data.gov portal along with many state and local portals are machine-readable, issued in standard formats, and have clear licensing terms, the US private sector has greatly leveraged the open datasets. This is perhaps best illustrated through the recently launched DATA USA (April 4, 2016).

DATA USA is a free and open platform created collaboratively by MIT Media Lab, Deloitte and Datawheel (a Media Lab spinoff). The platform aggregates public data relevant to key issues providing what many consider to be the most comprehensive and easy-to use open-source visualisation tool for public data. As one leading expert put it, "It's essentially a one-stop shop for information that is easy to search, understand, embed, and build into new code." This platform provides tools that deliver results that are easy and able to be incorporated into social media.

Our team looked and experimented with many portals and applications, and did not find anything comparable to the Data USA system.

OPENDefra

The Secretary of State for DEFRA set a challenge for the department to transition to a more open, collaborative and data-driven organisation resulting in OPENDefra. OPENDefra was a collaboration of internal and external participants (eg. Open Data Institute) who were able realise the release of over 11,000 datasets in 18 months (8000 specific datasets were mandated to be opened by the Cabinet Office). Our communications with the UK suggests that the big catalyst to opening the data came from the realisation that the data had potential uses and engaged users outside of the Department. Mandating a quota of datasets to be opened within a specified time-frame meant that collaboration was initially forced but led to genuine long lasting collaboration and expertise sharing, and the culture of data sharing. **OPENDefra is used as the key case study in the UK to encourage data sharing and Open Data amongst other agencies.**

Light Detection And Ranging Open Data (LIDAR)

As a result of the opening of LIDAR data many applications and experiments occurred including resources for schools, the game Minecraft, modelling of snowfall for scientists working on climate change, in urban planning and civil engineering to help plan and manage infrastructure by transport, energy and utility companies.

Previously this data was a revenue generator causing some concerns over revenue reduction if the data were to be opened. However, while revenue disappeared, DEFRA saved money by opening the data. Prior to Open Data, many of the flood predictions were done by companies using less reliable datasets. The models and applications in turn had to be carefully reviewed due to data quality issues. **The opening and subsequent re-use of the high-quality LIDAR data has alleviated testing and evaluation costs.**

INSIGHTS - PRIORITY ENABLERS CONSIDERATIONFOR NEW SOUTH WALES

- **Publish a complete catalogue of all datasets, including datasets that are restricted.**
- **Identify which datasets are important economic drivers for NSW's future[36], with prioritisation for datasets which will promote growth and development in regional NSW[37].**
- **Collaborate with the NSW Treasury to explicitly fund Departments opening up high-value datasets in machine-readable format.**
- **Consider adopting an international metadata standard and making this mandatory across all datasets.**
- **Consider a one stop shop portal /platform for all NSW data, and support national approaches that that can interact and pull data from regional and other portals.**
- **Identify workforce skills/knowledge gaps and opportunities to work with local government and other NSW agencies.**
- **Consider publishing milestones, progress reports and dashboards that allow monitoring of progress toward Open Data.**

[36] Currently NSW has strong economic diversity in services output including financial and insurance services, health care and social assistance, professional, scientific and technical services. Service industries may be improved through smarter data and analytics. Open Data should be seen as an opportunity to enhance these services.

[37] These areas include biotechnology, renewable energy, mining, fishing and agriculture.

PART 4: Future Directions

There are many international studies on Open Government, Sharing and the Right to Information, and Open Data.

Relevance of Open Data for NSW

As revealed in the communications with overseas entities, Open Data often has the greatest immediate impact for citizens at the sub-national levels. This is because applications and software developed as a result of Open Data at the sub-national levels often solve common problems which citizens can easily identify with. Common applications include those related to public transport, waste disposal, and zoning requirements. Future studies should seek to evaluate Open Data at sub-national levels, as well as evaluate how national Open Data frameworks are integrated with sub-national Open Data frameworks.

As seen across all jurisdictions, Open Data is still a developing concept with initial legislative, policy and regulatory work developed in leading jurisdictions, and implementation of policies and projects well under way. Leading jurisdictions and in particular the UK have experienced and addressed many of the barriers to Open Data operating within the NSW environment. However, the UK's legislative, regulatory and operational enablers have developed to address many of the initial barriers with new enablers including the recent passing of the *Digital Economy Act 2017*.

Considerable progress has been recorded and benefits delivered including those identified in the case studies highlighted throughout this Report. There has, however, been very little work done on measuring impact in any jurisdiction particularly from the dual limbs of social and economic savings together with the impact on participative democracy and citizen centric policy development and service delivery. Measuring impact of Open Data will be a critical component moving forward. Whether there is continued long term investment in Open Data is dependent on its impact. Impact should be measured both in the short and long terms. Cost effectiveness, for example, may be slightly improved in the short term but over the long-term applications could have led to significant efficiencies for a department, and for an entire industry.

Directions for future research

This report is necessarily a snapshot of a rapidly moving landscape and highlights a number of areas where further research would support the drive to Open Data in NSW. Particular priorities should include:

- Measuring the benefits of Open Data to the community and government in a consistent, transparent way that considers the dual limbs of social and economic impacts including citizen centric policy development and service delivery. This will help build support for Open Data initiatives and also with identifying *which* Open Data initiatives offer the best return.
- How to improve user/community awareness and take-up in Open Data. The extent of the data available is not always realised by potential users. This will need to move beyond passive portals toward active engagement and collaboration and research can inform the selection of strategies to achieve this.
- How to foster and improve Open Data for smart cities and regional areas. Many of the applications with the greatest impact to citizen's daily lives involve data usage and innovation for councils, smart cities and regions.
- Measuring the direct financial and service delivery benefit to both the public and private sectors. Few jurisdictions have measured the direct financial benefit of Open Data versus the costs associated with opening data. It is important to keep in mind that merely measuring public sector savings will not necessarily be an accurate reflection of overall financial gain

and efficiencies. Financial benefit to the private sector must also be considered. Many Open Data projects have initially been funded by governments. As Open Data agendas progress finding sustainable funding models will be imperative. As agencies measure financial benefits gained it may be worthwhile considering the placement of a portion of financial gain into an Open Data development fund for future projects.

- Applying and measuring the effect of Open Data initiatives on public participation and government policy development.
- Developing secure sustainable funding for Open Data projects.
- Participation in metrics for Open Data by councils and smart cities in NSW, and potentially for all of Australia and on a global basis. There are no metrics for Open Data by councils and smart cities for Australia or on a global basis.
- How to develop and improve skills in data collection and management among public servants. This will build the skill set required to more effective decision making and provide more robust understanding of the data ecosystem, and the necessary safeguards.
- Developing specific strategies to address key concerns in NSW (for example, the UK's Anti-Corruption Strategy which is embedded into its Open Government National Action Plan 2016-2018).
- Developing standard formats and processes (For example, the Contracting 5 (C5) initiative at the Open Government Partnership Global Summit 2016 has the UK, France, Mexico, Colombia and the Ukraine working to develop and use the Open Contracting Data Standard, and will use data to evaluate the new standard to evaluate public procurement.[38]
- Development and support for different stakeholders other than government (for example researchers, essential industries in the private sector) to adopt open access and Open Data policies[39].
- Assessment of benefits and risks of opening data and sharing sensitive datasets with researchers and private organisations (see *UK Digital Economy Act 2017*).

[38] Open Contracting Data Standard: Documentation, http://standard.open-contracting.org/latest/en/

[39] FOSTER, Next Steps for Open Access and Open Data Research Policy (Nov. 22 2016) https://www.fosteropenscience.eu/event/next-steps-open-access-and-open-data-research-policy