New Zealand's progress towards linking data 'to' and 'by' location, to unleash the power of data to change lives

Note by Statistics New Zealand

Summary

Statistics New Zealand’s vision is to unleash the power of data to change lives. Linking socio-economic data 'to' a location, and integrating statistical and geospatial information 'by' location is a key enabler for increasing the value of data. By value we mean the ability for people, business and government to make better decisions. There is also significant opportunity for the public sector to deliver better services through smarter targeting of limited resources. Gains from data innovation are estimated to be worth billions of New Zealand dollars. An integrated, location-enabled data eco-system will enable new insights, new analysis and new statistics.

Statistics New Zealand have been building the geospatial infrastructure and capability for being location enabled. New Zealand has a wealth of information on people and businesses but it has been difficult to integrate. Location is a universal key to link and unlock the value of data and improve statistical business processes. Work is progressing with the elements of Statistical Spatial Framework for the integration of statistical and geospatial information aligned to the international developments led by the United Nations. This document outlines the New Zealand approach and progress towards location enablement.

The document is presented to the Conference of European Statisticians’ seminar on “Geospatial information services based on official statistics” for discussion.
I. Introduction

1. Statistics New Zealand is entrusted by Government and the people of New Zealand as leaders and stewards of the Official Statistics System. We are responsible for providing official statistics that are the result of a careful statistical production process and deliver reliable key statistics.

2. However, we have a broader responsibility to work with colleagues in the data ecosystem to ensure that our nation’s data services and products deliver to the needs of the community. Our role gives us the mandate to respond to New Zealand’s increasingly urgent data demands and places us in an exciting position to enable change in the data ecosystem. We work in partnership with other agencies.

3. Our environment is changing and our customers are demanding more data. Decision-makers, policy-writers, Maori and iwi, business, community groups and individuals want to enhance their use of rich data resources held to inform thinking and evidence-based decision making. We are committed to extending our products and services to ensure that we create customer value at the heart of everything we do.

4. Customer demand is growing especially for social, economic and environmental information for small geographic areas to support evidence based decision-making. An increasing shift by national statistical agencies to using more administrative data increases the potential for providing data for smaller, more relevant geographies. Technological advances in spatial analysis and presentation of data are increasing customer expectations and demand for visual presentation of data. Statistics New Zealand are working closely with the national mapping agency, the Land Information New Zealand (LINZ), to improve linking of geospatial data and statistics.

II. Statistics New Zealand's organisational strategy

5. In 2015 Statistics New Zealand launched a new vision to “Unleash the power of data to change lives”. With it came two ambitious goals to double the value of data provided by Statistics New Zealand by 2018 and create a tenfold increase in value of the data provided to NZ by 2030. See figure 1.

Figure 1
Statistics NZ’s vision
6. This has required us to build on our historical remit as a provider of official statistics for decision making, to a new expanded remit focusing on anticipating and responding to the needs of our customers in an ever-changing, data driven environment. Producing robust and important official statistics was a given, but customers increasingly want to enhance their use of rich data resources to inform thinking and evidence-based decision making. We identified 6 key drivers for change:

(a) **New Zealand is missing out on a data-driven innovation dividend** – an increasing number of reports are concluding that New Zealand is not securing the potential benefits of data-driven innovation. The most recent\(^1\) estimate is that increased use of data to drive innovation could deliver $4.5 billion in benefits to New Zealand over the next five years. We have a role in achieving this.

(b) **Focus is shifting from statistics to data** – our traditional role has been to provide official statistics. Data was valued largely as an input into the production of these statistics. While core statistics remain critically important, increasingly decision makers want a richness of information that enables them to make more nuanced decisions. This is resulting in a shift from the statistical outputs that we produce to the interrogation of the data sets that sit underneath the statistics.

(c) **More data is available than ever before** – data volumes are growing exponentially as more data becomes accessible. This has the potential to provide greater insights to decision makers than ever before. However paradoxically, it is increasingly difficult to access the rich information that sits within increasingly larger and larger data sets and assess its quality. Decision makers are increasingly looking to us to provide leadership and advice on reusing data where possible, promoting co-operation in data storage, leading the development of data capability, providing data integration and ensuring that our data management and practices are world leading.

(d) **Growing demand for real-time insights** – the exponential growth in data is being driven by digital technologies and the embedding of sensors and connectors in products (the internet of things). It has been estimated that by 2020, 50 billion devices will be connected to the internet and that the internet of things will have 5 to 10 times more impact on society than the internet. Harnessing this real-time data and using it to augment or replace existing statistical output is a critical challenge facing statistical organisations world-wide.

(e) **Drive for citizen-centred public services** – the desire for better integrated, citizen-centred public services requires the ability to use data supported by joined up approaches. Data and information architecture that supports joined up approaches is essential to achieving these aims.

(f) **Social license** – as data about individuals proliferates across the data ecosystem, the concerns of citizens with regard to their personal privacy is growing and the desire for individuals to have control over their own data. A tension exists between the needs of decision makers to generate insights at much deeper level than ever before in order to solve systemic problems, such as the current focus in New Zealand around eliminating child poverty, and the desire of individuals to have their rights and privacy maintained. Our brand as trusted and independent remains strong, and is a foundation that allows us to be successful. However as we increasingly provide new data-related services, we will need to

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\(^1\) Data Driven Innovation in New Zealand, Sapere/Covec 2015
ensure that we maintain our “social license” as a trusted steward of the nation’s data and information.

7. As part of refreshing our strategy we identified a number of strategic roles we have to play to get the outcomes we need to deliver – that of provider, steward, enabler and innovator. See figure 2.

Figure 2
Statistics NZ’s strategic roles

III. The role of geospatial

8. Geospatial will play an important role in growing the value of data. Spatially enabling statistics is the contribution geospatial to make throughout the value model (figure 3) whether it be through;

• driving efficiencies in sourcing and shaping data,
• providing standards and guidelines for managing, analysing, visualising and disseminating data,
• providing customers with reliable and comprehensive location-enabled data that is easy to access and use, or
• undertaking more geospatial analysis of our data and incorporating this into our statistical business processes, products and services.
9. We know that doubling the value of data in the short-term for New Zealanders is less about more data, and more about doing different things with the data that we currently have. There is a growing demand for small area information on people and businesses, coupled with a shift to using administrative data with a location component such as a street address to enable an enhanced or more detailed regional view. This is the convergence of statistical and geographic data to realise value.

10. Increasingly we need to accommodate flexible non-mutually exclusive geographies. Data for and about Māori is a good example. Māori are New Zealand’s tangata whenua (people of the land) or New Zealand’s indigenous population. In our role as kaitiaki tatauranga, or steward of government data, we view the information we hold as taonga, or treasure. Māori have an increased desire to access data in order to be agents of their own change. Responding to the needs of Māori customers for a “quadruple bottom line” approach to value challenges the status quo in a number of ways including what is measured, how it’s measured and how it is communicated or presented. Māori also have a unique perspective on what data is important – a tract of land that may be unproductive in one person’s eyes may be a national treasure in another’s. Geospatial has an important role to play in meeting these needs.

11. To increase the value of data we need the ability to bring together economic, social, cultural and environmental data using location. Linked location enabled data provides a richer view across domains.

12. The increased focus from our current Minister of Finance on data driven decision making and an investment approach to government spending requires data that support analysis at a much more granular level. It requires us to develop and steward accessible, integrated data that enable evidence based decision making. We have established a centralised collection of linked administration data that is of significant statistical value. The data is de-identified and made available to approved researchers providing a research dataset of longitudinal microdata. Integration of data by location and spatial analysis is
playing an increasing role in informing research, policy and evaluation questions to provide valuable insights into some of New Zealand’s more complex decisions, leading to positive outcomes for New Zealanders.

**IV. Geospatial activities**

13. We understand that getting the fundamentals right is critical. We are aligning to the global Statistical Spatial Framework (SSF). See figure 4.

Figure 4
Statistics NZ’s Statistical Spatial Framework

14. We have got a number of initiatives underway including:

- Foundation geospatial capability: we are creating the base geospatial infrastructure to access, manage and maintain spatial data and geography geospatially;

- Standards and guidelines: Reviewing our Statistical Unit Model. Location is integral to a register based integrated data design, Geospatial confidentiality research, Review the Statistical Act 1975 including to provisions for location enabled data; (see figure 5)

- Metadata interoperability: work to improve metadata - not just of data held by us but of data held across government;

- Standard geographies: Reviewing our Statistical Standard for Geographic Areas; Complete a backlog of maintenance of our lowest level geography;

- Data Management: Delivering geocoding tools and services; Geocoding data – we’ve recently geocoded our 2013 Census and Business Register addresses to a location;

- Agreed and authoritative geocoding: We’re creating a Statistical Location management system – aligned to a Property Data Management Framework (including ISO standards) created by LiNZ.
15. The statistical standards and geographic boundaries we use to output sub-national data for are in the process of being reviewed. The current statistical standard for geography has been in place since 1992 and is no longer relevant, resulting in a reliance of administrative boundaries. We aim to create statistical standards for geography that are designed to be relevant and maximise the value we get from data with minimal suppression whilst maintaining individuals’ confidentiality.

16. We understand that working in partnership is vital to being successful. We have a strong relationship with our national agency Land Information NZ (LINZ). LINZ leads the implementation of New Zealand’s national spatial data infrastructure (SDI) which aims to ensure New Zealand’s fundamental spatial data is easy to find, share, and use. A steward and custodianship framework has been established to ensure NZ’s fundamental spatial data is well managed, and maintained to agreed quality. Statistics NZ along with other agencies are partners. In particular, we are the steward of the Administration Boundaries spatial data theme and are involved in developing the standards that underpin the efficient and effective use of fundamental spatial data. In NZ our smallest statistical spatial unit, the Meshblock, also forms the basis of the electoral and government administration systems. We have an operational role in defining these geographic boundaries. We also work closely with LINZ around addressing.

17. For the first time in NZ our 2018 Census of Populations and Dwellings will use a mail-out collection mode for a large percentage of dwellings. We are creating a Statistical Location Register to enable this. At the same time LINZ are re-developing their Address Information Management system. The two projects have worked closely sharing designs and following consistent standards to ensure interoperability so that we can establish address management and maintenance processes across the system. We recently held a joint ‘data mash up’ with LINZ that explored and demonstrated the value of an integrated statistical and geospatial data eco-system.
18. Helping people to get value from data is a big focus for us. There are a number of recent initiatives where geospatial has been an important component:

- We co-produced the report on the state of New Zealand’s environment (Environment Aotearoa 2015 http://www.stats.govt.nz/browse_for_stats/environment/environmental-reporting-series/environmental-indicators/Home.aspx) with the Ministry for the Environment. We provided statistical and geospatial expertise to prepare maps, analyse spatial data and use our geospatial technology platform to deliver interactive maps. This report was very well received with our involvement shifting the conversation away from the quality of the data to what the data was saying.

- Use of an intermediary Koordinates to provide our expert customers with a data service. The initiative is called DataFinder (https://datafinder.stats.govt.nz/). This service was implemented with minimal cost using technology funded and shared by other government agencies.

- Working with the NZ Treasury to co-develop a technique that would simplify the presentation of complex modelled data. By using mapping tools, we were able to offer readers with a variety of different mediums for them to view and understand Treasury’s modelling. Social Investment Insights provides information about New Zealand children (aged 0 to 14) and youth (aged 15 to 24) at higher risk of poor future outcomes (http://innovation.stats.govt.nz/initiatives/social-investment-insights/). This tool was developed very rapidly and was very well received.

V. Issues and challenges

19. We have ambitious goals and to meet them we need to change the way we operate. Shifting from an organisation that has been a very good producer or statistics for 100 years or so will be a challenge. It took about 6 months for our people to become comfortable with the concept of “unleashing” so we understand that this is a journey.

20. Our legislation creates challenges. For example the sharing of address data with our LINZ is very restricted. We have set ourselves a very challenging timetable for a legislative review that has been just started.

21. Related to the legislation is the challenge of understanding our Social Licence, and what can be shared and what not.

22. Non-disclosure creates technical challenges as we look to meet customers’ needs for smaller area data.

23. It is also a challenge to understand what our customers need from us and the best way to deliver to them.