NSW Standard for Spatially Enabling Information

May 2018
Under Review

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NSW Standard for Spatially Enabling Information

1. Purpose

This standard is issued by the NSW ICT and Digital Leadership Group (IDLG) in accordance with the *NSW Government ICT Strategy*. The purpose of this document is to establish the standards for spatially enabling NSW Government data and information.

2. Introduction

2.1 Information Management Framework

A key initiative of the *NSW Government ICT Strategy* is the development of an Information Management Framework to support the way government administers and uses data and information.

The Framework is a set of standards, policies, guidelines and procedures which are implemented either manually or, where possible, automated through technology. This will allow data and information to be managed in a secure, structured and consistent manner.

It will ensure that data and information can be appropriately shared or reused by agencies, individual public sector staff, the community or industry for better services, improved performance management and a more productive public sector.

2.2 About the Standard

This standard forms part of the Information Management Framework. It also supports a number of key initiatives at the national, state and agency levels of government.

Aligned initiatives and priorities detailed in the following:

- *The Australian and New Zealand Foundation Spatial Data Framework*
- *NSW Foundation Spatial Data Framework*
- *NSW ICT Strategy*
- *NSW Location Intelligence Strategy.*

Spatially enabling data and information

Spatially enabling information requires the addition of a **location** element to data or information captured through day-to-day business and operational transactions.

Spatial enablement involves both the association of 'location' with particular datasets or information resources; and also the provision of an infrastructure that allows government to readily make decisions that take account of 'location'. This enablement empowers users with the ability to compare or integrate disparate datasets to facilitate the delivery and management of better services through analysis and interpretation within a geographical context.

Successful implementation requires the use of standards to ensure the content or meaning of 'location' is clear and consistent. It is also necessary to determine the most appropriate level of granularity required for 'location' without compromising data accuracy and the privacy of individuals and entities associated with the information.

Why is spatial enablement important?

The digital age has witnessed the rise of location based services and technology. There is a greater emphasis than ever before on customising the level of interaction citizens and government exchange with one another. The rise of Web 2.0, cloud computing, semantic web and a swathe of web services is driving progress towards a spatially enabled society, facilitating the seamless integration of 'where' with the 'what', 'how' and 'why' of government decision making.

NSW Government agencies capture address information in 20-30 million service transactions with citizens and businesses per annum, and state government services are delivered at thousands of locations throughout NSW. Spatial enablement of government information allows aggregation for spatial analysis, or for community or application developer access. It supports the objectives to derive optimal value in terms of community outcomes from the information assets held by government.

Benefits

Benefits of spatially enabling government information may include:

- **Improved decision making:** analysis of service consumption through spatial distribution, and visualisation of spatially occurring events and trends in the context of Census and other information resources aids in evidence based decision making;

- **Whole of Government outcomes:** analysis of spatially enabled service delivery information across the government will improve the evidence resources available for strategic decision making;

- **Reduction in administrative costs:** underlying datasets would be maintained by a lead agency;

- **Enhanced industry development opportunities:** greater availability of goverment information in a meaningful way could pave the way for targeted community applications and location services;

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[1] Refer to Appendix A – Glossary for definition of 'spatially enabled society'

Department of Finance, Services and Innovation | NSW Spatial Services

- **Enhanced accessibility to services:** information about service and delivery point is associated with location, enabling access through mobile devices; and
- **Enhanced interoperability:** disparate datasets are able to be brought together and integrated into a single view for analysis and presentation with the ability to identify relationships that were not previously apparent.

Foundation Spatial Data Indexing (FSDI) framework

Spatially enabling business data means applying (preferably standard) location or spatial indexes with the core being parcel identifier, property identifier, address and spatial coordinates (x, y, z). These core spatial indexes underpin a range of authoritative administrative boundary indexes – localities, local government areas, electorates and the Australian Statistical Geographical Classification (ASGC).

A range of business specific geocoding indexes (Travel Zones, Post Codes, etc.) also enabled from the core indexes, as shown here in Figure 1- FSDI framework, are aligned or linked to these location indexes, enabling geocoding and location based services for business and community applications.
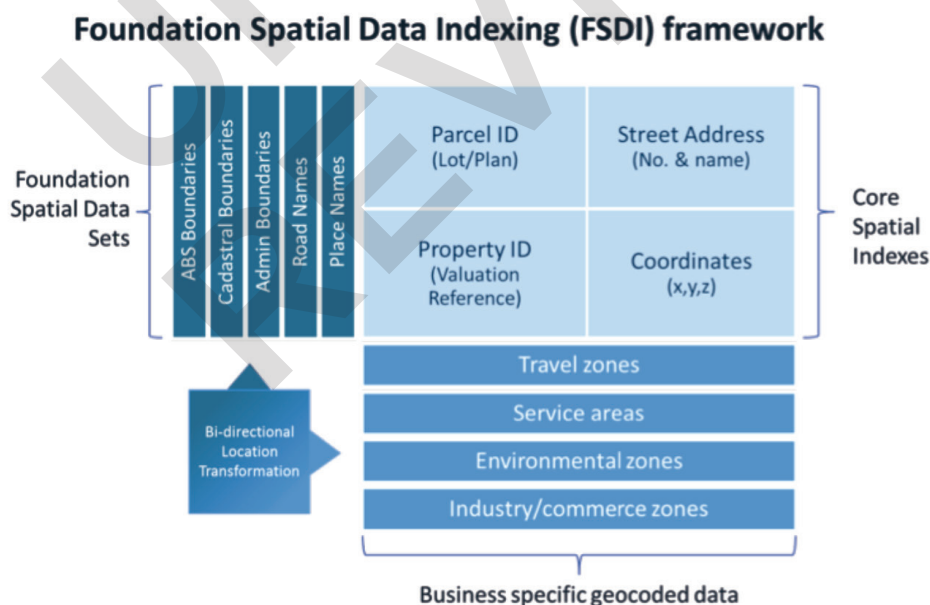

Figure 1: The FSDI Framework

A well-structured and validated index framework means there are proven, reliable, consistent and repeatable methods for linking and integrating disparate datasets. All agencies and users benefit from this consistency and repeatable processes. The value achieved and the confidence level obtained when data with different location indexes are integrated can often be significantly compromised by inconsistent application; e.g. the use of a geocoded address for the design of national broadband network connection design process.

3. Implementation

NSW Government has adopted a business-driven approach to standards for data and information based on the following five criteria:

Standards are:

- **Aligned** – with the principles and outcomes of the IM Framework;
- **Relevant** – to the specific business needs, objectives and operating environment of NSW Government agencies, so that their business value is evident;
- **Proven** – established or endorsed by the industry sector or professional community;
- **Aspirational** – supporting phased implementation or continuous improvement;
- **Enterprise-wide** – support for developing people, processes and technology.

Standards are incorporated into the Framework where existing or potential business needs and opportunities are recognised.

This standard will be implemented by agencies according to their specific business needs and operating environment. Standardisation will help to maximise the use and value of information and minimise risk.

Agencies are expected to refer to the Framework and use standards that are relevant to a specific project, process or corporate objective.

Further information about NSW Government approach to information management and standards can be found on the website of the *NSW Government ICT Strategy* at: http://finance.nsw.gov.au/ict/information-management-framework

4. Scope

This standard is for use by all NSW Government Departments, Statutory Bodies and Shared Service Providers. It does not apply to State Owned Corporations (SOCs) in accordance with Premier's Memorandum M1999-19 Applicability of Memoranda and Corporations, although SOCs are encouraged to adopt this standard.

Other stakeholders are encouraged to adopt this standard, including:

• Public Trading Entities (PTEs);
• Entities fully funded by the NSW Government; and
• Local Government Authorities.

This is in addition to industry and academia so that they may benefit from the spatial enablement of information.

5. Principles

5.1 Recording NSW Government service delivery information

NSW Government service application or service delivery transactional data should be captured and recorded so it can be linked to a location element associated with the service. This location element should be captured to the most granular level of information required by the agency regulating the service (coordinate, address, site, suburb, region, state, etc). Figure 2 illustrates this principle.

Service delivery information to be spatially enabled may include government asset information (for example, school sites or NSW agency service point sites), or service delivery transactional information (for example, a trades licence, identity card application, land use or site use permit, or the delivery of government services to individuals or specific regions).

Government properties or other assets should be associated with an official NSW address, or otherwise associated with location (for example, capture of XY coordinates for bus stops), and recorded in relevant information systems at the time of capture (in agency specific systems, or with Government Property NSW , and/or Spatial Services, as appropriate).

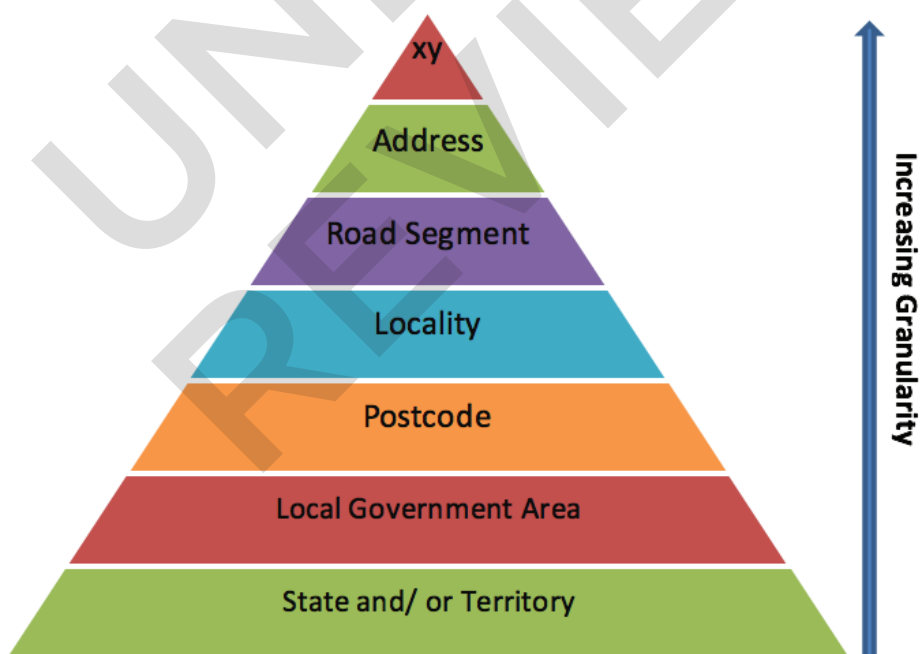Figure 2 Example hierarchy of 'location' indicating relative level of granularity

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[2] Government Property NSW enquiries can be made through: feedback@property.nsw.gov.au
[3] Spatial Services enquiries can be made through: SS-SDS@finance.nsw.gov.au

5.2 Verifying address information

Address information captured by the agency should be appropriate to the agency's purpose but should also consider the potential utility of the information across government.

Address information should be fit for purpose to enable analysis of government service delivery by address, and should therefore be verified against authoritative reference address data following applicable standards and guidelines.

Address data recorded by agencies should comply with the NSW Address User Manual. This document is available at:

http://www.gnb.nsw.gov.au/__data/assets/pdf_file/0007/199411/2018_NSW_Addressing_User_Manual.pdf

Agencies may also wish to record the geocode of an address, the Delivery Point Identifier (DPID) associated with an address, or other administrative information.

Agencies should verify addresses at the time of capture in the business processes maintained by the agency by using the NSW Point address validation service as provided by DFSI Spatial Services. To access NSW Point contact:

> Spatial Data Services
> Spatial Services Delivery Team
> PO BOX 143, Bathurst NSW 2795
> T: (02) 6332 8410
> E: SS-SDS@finance.nsw.gov.au

5.3 Allocating a geocode

Geocodes only need to be captured or assigned by the agency where they are appropriate to the agency's purpose.

For addresses the geocode can be sourced at any time using a range of offerings from Spatial Services. Those agencies wanting to allocate a geocode at the point of collection may be achieved through the use of NSW Point.

It is not necessary to assign a precise coordinate to every piece of information that is recorded by the NSW Government. A hierarchical approach should be followed whenever possible when recording location information (refer to Figure 2). The type of information being captured is a key determinant in allocating a particular spatial element.

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[4] Refer to Appendix A – Glossary for definition of 'geocode' [5] Refer to Appendix A – Glossary for definition of DPID

6. Standards

The use of common spatial standards fosters interoperability across the broad spectrum of information captured by NSW Government agencies.

Agencies should be aware of the requirement to ensure that a consistent and common reference datum and projection are used when capturing spatial information. In NSW all spatial data is related to the Geocentric Datum of Australia 1994 (GDA94) and the height datum Australian Height Datum 1971 (AHD71). Whilst the use of GDA94 and AHD71 is the preferred standard in NSW it is acknowledged that other datums and projection systems may be used. This is particularly common with the capture of coordinate information (refer to 6.1).

The following sections detail the prescribed authoritative source of spatial enablement information.

6.1   XY: GDA94 and AHD71

The XY refers to longitude (X) and latitude (Y) which may or may not include height information at a particular epoch and is associated with textual based information. Agencies collecting and/or assigning geocodes should ensure wherever possible that the correct datum and projection as described above are used. The use of a consistent datum and projection ensures interoperability of information in a variety of geographic information systems (GIS).

6.2   Address String

An 'address' compromises the core components road number, street name, street type, suburb, etc. Together, these components are known as an 'address string'. Most commonly government information may be associated with an address where the XY may be derived from the address string.

The address information recorded by NSW Government agencies may include all or some of the address components listed above and those contained in Figure 2.

NSW Government agencies collecting address string information should check the validity of the information against NSW Point. Note: Australia Post is an authoritative source for postal addresses but not for physical address strings.

6.3 Road Segment: Digital Topographic Database

The road segment information recorded by agencies may include primary attributes such as road name (e.g. where the full address is unavailable). Recording of this information should be undertaken using the 'road segment' dataset available from the NSW Digital Topographic Database (DTDB), held and maintained by DFSI Spatial Services. This dataset is a foundation spatial dataset as defined by the NSW Foundation Spatial Data Framework (FSDF). The NSW FSDF represents the single source of truth and authoritative spatial datasets in NSW.

Further information for the 'road segment' dataset is available from the NSW Spatial Data Catalogue.

6.4 Locality: Digital Cadastral Database

The locality information recorded by agencies should conform to the 'suburb' dataset available from Spatial Services' NSW Digital Cadastral Database (DCDB). The Suburb dataset is a foundation spatial dataset as defined by the NSW FSDF.

Further information for the 'suburb' dataset is available from the NSW Spatial Data Catalogue.

6.5 Postcode: Digital Cadastral Database

Australian postcodes are managed by Australia Post for the exclusive purpose of assisting in delivery mail to its customers. To that end Australia Post only allows its postcodes to be used as a "non-commercial" reference. Postcodes also change continually, and bear little relationship to other official geographies such as State borders and Local Government Areas. For these reasons, their use as a determinant of location for NSW Government service delivery is inappropriate.

6.6 Local Government Area: Digital Cadastral Database

The Local Government Area is an administrative boundary containing a number of localities or suburbs. In the course of recording information that involves the collection of local government areas, NSW Government agencies should use the 'local government area' dataset contained within the NSW DCDB for verification. The Local Government Area dataset is a dataset defined by the NSW FSDF.

Further information for the 'local government area' dataset is available from the NSW Spatial Data Catalogue.

Local Government Area is the only administrative boundary specified in this standard. For some processes or transactions it may also be useful to record data about other types of administrative boundaries. In such cases, agencies should refer to the relevant industry standard or contact Spatial Services for further information (see section 7).

6.7 Interstate Addresses

NSW Point services contain official addresses for States and Territory jurisdictions in NSW. Agencies should use NSW Point as an authoritative source for all Australian addresses.

7. Review

This standard will be maintained by the LLG. The standard is subject to review at least every two years, or as appropriate.

8. Contact

For assistance with any aspect of this standard, please contact the NSW LLG secretariat:

The Director, Spatial Operations
DFSI Spatial Services
346 Panorama Avenue
Bathurst NSW 2795
E: SS-SpatialOperations@finance.nsw.gov.au

9. Appendix A – Glossary

TERM	DEFINITION
Address verification	Confirming and standardising address information based on a number of key parameters enabling the matching of data across a number of datasets.
AHD71	Australian Height Datum 1971 establishes the height reference in Australia and passes through mean sea level at a number of locations.
ANZLIC	The Spatial Information Council (ANZLIC) is a joint initiative of the Australian and New Zealand Governments, and the State and Territory Governments of Australia. ANZLIC is the peak Government body in Australia and New Zealand with the core responsibility for the stewardship of spatial information.
Data	The representation of facts, concepts or instructions in a formalised (consistent and agreed) manner suitable for communication, interpretation or processing by human or automatic means. Typically comprised of numbers, words or images. The format and presentation of data may vary with the context in which it is used. Data is not information until it is utilised in a particular context for a particular purpose. (Office of the Australian Information Commissioner (OAIC), 2013). Data is typically considered to be conceptually at the lowest level of abstraction.
Datum	In the context of this standard a datum is used to project data to its real position on Earth.
DCDB	Digital Cadastral Database maintained by DFSI Spatial Services

TERM	DEFINITION
DPID	Delivery Point Identifier is a unique eight-digital number that has been allocated to each address by Australia Post. The DPID is the key component of the printed barcode that is used to achieve bulk mail discounts.
DTDB	Digital Topographic Database maintained by DFSI Spatial Services
FSDF	The NSW Foundation Spatial Data Framework (FSDF) provides a common point of reference for the assembly and maintenance of foundation level spatial data held by NSW Government agencies. It contains the best available, most current, authoritative source of foundation spatial data under ten foundation themes.
GDA94	Geocentric Datum of Australia 1994
Geocode	The process of assigning geographic coordinates (latitude and longitude) derived from other geographic data such as address.
Information	Any collection of Data that is processed, analysed, interpreted, classified or communicated in order to serve a useful purpose, present fact(s) or represent knowledge in any medium or form. This includes presentation in electronic (digital), print, audio, video, image, graphical, cartographic, physical sample, textual or numerical form. (Office of the Australian Information Commissioner (OAIC), 2013) *Information is typically considered to be at a higher level of abstraction than Data.*
NSW Location Leadership Group (LLG)	A high level non-statutory body chaired by the Director General, Department of Finance and Services to coordinate the development of the New South Wales Spatial Data Infrastructure (SDI).

TERM	DEFINITION
NSW Spatial Data Catalogue	The central search and discovery portal for spatial metadata in NSW (http://www.sdi.nsw.gov.au). The NSW Spatial Data Catalogue holds metadata statements harvested from agencies across NSW.
Persistent Unique ID	The unique ID associated with an address that does not change as the address is transformed or updated.
Projection	Projection in the context of this standard refers to the geographic projection that is used to transform latitude and longitude on a plane.
Semantic web	Is the extension of the content contained on the internet beyond the boundaries of applications and websites (semanticweb.org).
Spatially enabled information	The addition of a spatial element to information for the purpose of geographic analytics and decision making.
Spatially enabled society	The concept of spatially enabled society is about the empowerment of governments, citizens and business to organise their activities and information for improved decision making. This concept revolves less around the management of spatial information but rather the governing of society spatially.
Spatial data	Data that identifies a geographic location is usually stored as coordinates and can be mapped.

(Also known as geospatial data). |
| Spatial information | Information that can be geographically referenced, i.e. describing a location or any information that can be linked to a location (also known as geographic information). Spatial information is defined within the section 3A Surveying and Spatial Information Act 2002 (NSW). |

TERM	DEFINITION
Spatial service	Mechanisms for the discovery, browsing, and querying of metadata and/or delivery of spatial datasets and other resources via the Internet or any other media devices e.g. hard drives.
Transactional data	Data that is recorded during the transaction of information or services between two or more parties.
User	End consumer of information resource; those who use information as input to solve problems and/or makes decisions.

Document control

VERSION	DATE	COMMENTS
1.0	July 2015	New document
2.0	May 2018	Update branding

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