Module 3

Local Government Spatial Information Management

Toolkit Version 2.0

Building capacity for integrated spatial information management solutions

July 2007

Module 3

Data management principles

A joint initiative of the Australian Local Government Association and ANZLIC—the Spatial Information Council
Contents

Concise guide for technical managers ................................................................. 1
Module 1: Spatial information management in local government ......................... 41
Module 2: An Introduction to spatial information systems ................................. 65
Module 3: Data management principles .............................................................. 93

MODU LE 3

Data management principles

Guide for managers .................................................................................................. 96
3.1 Introduction ................................................................................................. 98
    3.1.1 What is data management? .............................................................. 98
    3.1.2 Guiding principles ........................................................................... 98
3.2 Why do we need to manage data? ........................................................... 99
    3.2.1 File naming conventions and folder structure .................................... 99
    3.2.2 Key drivers for improved data management ..................................... 103
    3.2.3 Statutory requirements for data and information management ......... 104
    3.2.4 Benefits of good data management ............................................... 104
3.3 Principles of good data management ....................................................... 106
    3.3.1 Data policy ...................................................................................... 106
    3.3.2 Data ownership .............................................................................. 106
    3.3.3 Data documentation and metadata compilation .......................... 107
    3.3.4 Data quality, standardisation, harmonisation and audit .................. 107
    3.3.5 Data lifecycle control .................................................................... 108
    3.3.6 Data custodianship ........................................................................ 108
    3.3.7 Data access and dissemination .................................................... 109
3.4 Establishing a data policy .......................................................................... 109
    3.4.1 Data acquisition ............................................................................. 109
    3.4.2 Fitness for purpose and point of truth .......................................... 110
    3.4.3 Data care (custodial duties) ......................................................... 110
    3.4.4 Data use and exchange ................................................................. 111
    3.4.5 Data security ................................................................................. 111
    3.4.6 Data usage monitoring ................................................................. 111

CONT INUED OVER PAGE
Contents

Module 3: Data management principles

3.5 Implementing data management—key roles and responsibilities .......................... 112
   3.5.1 Data management ‘champion’ ........................................... 112
   3.5.2 Data policy manager ......................................................... 112
   3.5.3 Data custodians .............................................................. 113
3.6 Data usage survey ................................................................. 113
3.7 Data cleansing ................................................................. 113
3.8 Additional support ............................................................... 114
   3.8.1 National ................................................................. 114
   3.8.2 State and territory ......................................................... 114
   3.8.3 Information on data standards ........................................... 114
Acronyms ............................................................................. 115

Module 4: Spatial data priorities, standards and compliance ........................................ 117
Module 5: Finding and getting hold of data .......................................................... 137
Module 6: Project management and justification ...................................................... 153
Module 7: Guidelines for selecting spatial information system software and hardware .... 173
Module 8: Raising capability for using spatial information ..................................... 197
Module 9: Map production guidelines ............................................................. 211
Module 10: Working together ........................................................................ 225
Guide for managers

Context

All councils collect, create, store and use data, most of which have been obtained at considerable cost or effort. It has been estimated that 90% of costs to establish a spatial information system can be attributed to the development of the thematic datasets, and that more than 80% of all data have some form of geographic component and can therefore be referenced to geographical locations and spatially represented as points, lines or areas.

Experience reveals that treating data as long-term assets or part of a council’s core infrastructure and managing data within a coordinated framework produce considerable savings and ongoing value. Proper processes and procedures for data and information management are the foundation of an efficient management system. Many jurisdictions throughout Australia have established policies governing access to and use of data and information, along with custodianship guidelines and information management strategies.

This guide provides background information on leading practice for managing data as assets and valued resources. The primary audience is those responsible for managing spatial data and information, although the principles described are equally applicable to other types of data.

Policies and procedures are required to guide the transition from tactical, project-based data collection and management to a strategic information infrastructure that will inform decision making on a wide range of issues. In some situations data are incomplete, not easily accessible, not up to date and lack any documentation on accuracy and reliability. Utilising these data on a whole-of-council basis rather than just within the group that collected them can be difficult; indeed, even use of such data by the collecting group can present difficulties and result in unnecessary errors.

This module provides a framework to integrate the activities of data collectors, data managers and information providers, to ensure that data are managed as a valuable asset.

Data management will only be given the priority it requires if management is convinced that the tangible long-term benefits flowing from this investment outweigh the costs.

Actions

Managers should focus on a goal of achieving an integrated information management solution for their council. This requires leadership, skilled people, computer hardware and software, applications and data, all successfully combined into a framework that ensures the appropriate tools and rules are in place to maintain data and turn them into useful information products to support operations and decision making.

This goal can be achieved through the formalisation of an infrastructure, production of guidelines, and the development of standards and procedures to support data management and processing. Managers can assist by ensuring the development and implementation of a data policy that addresses the following key elements:

→ creating an easily accessible data system, that can efficiently disseminate data collected as part of project activities to the widest range of users
→ developing core datasets as baseline products
→ providing leading-practice quality assurance mechanisms and procedures to produce validated, well-documented datasets that meet priority information requirements
→ archiving data collected to ensure their availability for multiple use, to safeguard the investment for future use and to conform with statutory requirements
→ improving the effectiveness and efficiencies of policy and program development through the coordination of data and information activities
→ providing timely and up-to-date data and information products to support a wide range of activities.

These elements are discussed in detail in the following pages.

**Acknowledgments**

Some material for this module is sourced from the United Kingdom Intra-governmental Group’s Geographic Information Working Group on Principles and Practice of Geographic Information Data Management, and from the Launceston City Council. These sources are duly acknowledged.

**Guide to symbols**

The following symbols are used throughout the Toolkit to draw attention to important issues and information.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>🟢 NOTE!</td>
<td>Information of which readers should take particular note</td>
</tr>
<tr>
<td>🟪 LEADING PRACTICE</td>
<td>Leading practice information</td>
</tr>
<tr>
<td>🟧 TIP!</td>
<td>Tips for readers, based on experience and aimed at saving time and other resources</td>
</tr>
<tr>
<td>🟧 CAUTION!</td>
<td>Caution—readers should take particular care, or the issue may be complex</td>
</tr>
<tr>
<td>🟧 HIGHER CAPABILITY</td>
<td>Capability raising—shows a signpost to a higher capability level</td>
</tr>
<tr>
<td><strong>Bold Text</strong></td>
<td>Bold Text—highlights an important issue</td>
</tr>
<tr>
<td>🟧 Boxed Text</td>
<td>Boxed Text—highlights issues specifically related to ANZLIC or ALGA</td>
</tr>
</tbody>
</table>
3.1 Introduction

3.1.1 What is data management?
Data management encompasses the full spectrum of activities involved in handling data, including:
- data policy development
- data ownership
- data documentation, metadata compilation and maintenance
- data quality, standardisation, harmonisation and audit
- data lifecycle control
- data custodianship
- data access and dissemination
- data security.

3.1.2 Guiding principles
This document addresses the key aspects of data management, giving consideration to the following guiding principles.
- Don’t reinvent the wheel—identify leading practice and implement it.
- Where possible, capture data once and use them for multiple and/or generic purposes.
- Avoid duplication in data acquisition.
- Use existing systems and/or facilities wherever possible.
- Manage data to maximise their value both during and after the project for which they were collected—design for long data life.
- Give priority to the broadest value data—that is, data that have benefits for multiple processes and multiple users.
- Develop long-term strategic goals for data and information management that also align to organisational needs.
- Select the most robust organisation with the broadest span of interest to be the most appropriate custodian of high-value general-use information.
- Reinforce and support data custodians and negotiate protocols for data access.
- Develop and enforce data documentation and metadata standards and approaches.

Ensure individual staff and council sections use documented data management processes, policies and procedures. Use the information in this module as a guide for linking the documentation of processes, policies and procedures to council business processes.
3.2 Why do we need to manage data?

Data may represent a large component of the assets of any organisation, and a council is no exception. Further, data are an important component at the base of the information pyramid (see Module 2, Figure 2.4). Knowledge is generated from information that has been extracted from data. This process supports the decision-making processes that drive a council’s functions.

Acquiring and managing assets, including data, requires expenditure of money, time and other resources. As for other asset types, expenditure on data should be used effectively. Geographic data may be acquired from a wide range of organisations external to a council and may be mixed with in-house data. This can make data management difficult and time consuming, if it is not undertaken in a structured and rigorous way.

The following sections provide guidance on ensuring that data, regardless of their origins, are managed effectively.

3.2.1 File naming conventions and folder structure

To be efficient, spatial data managers need a folder structure and file-naming convention that are practical and reflect the nature of the council, including its business areas, and the nature of the data.

If the majority of the council’s data are tiled (or mapsheet-based), a file and naming structure based on the tiles can be used to store and reference data. If the core business involves temporal (or time-based) data with regular updates [e.g. a new dataset is produced every month], then a file and naming structure that reflects the time series is more appropriate. In general terms, larger councils update their geographic data more regularly than smaller councils, reflecting both data volume and data management capacity.

The terms ‘file’ and ‘folder’ as used in this section refer to all data files and folders within the responsibility of the spatial data manager. Spatial data files may be called themes, layers, feature classes, levels, images, etc., depending on the vendor solution. Microsoft terminology, such as ‘folder’, is pervasive. Another term for a folder is ‘directory’.

An example of a file-naming and directory structure from the environmental field is included in the Herbert Resource Information Centre’s Data Principles and Guidelines publication. The Centre is a joint venture with a number of partners, including the Hinchinbrook Shire Council. This document is online at http://www.hric.org.au/hric_site/hric_info/Policies/Policies.asp.

The following file directory example comes from the Launceston City Council.

Launceston City Council was concerned that its spatial data, while well used by council staff, were getting out of control on its network. The Spatial Information Section managed 1,360 GIS feature classes (layers), of which 160 were core layers stored in an SDE database. As a result, a GIS directory structure was developed (Figure 3.1) that mirrored the council’s already established records management system.
Further, the Records Management Department of the council undertook a project to redesign its own records system. This system also became the structure for the council’s file directories, which the Spatial Information Section adopted for the spatial data directories. The benefit of a consistent approach to file naming and directory structures is that everyone in the council ‘speaks the same language’. This has resulted in time savings, as now all staff know where to look for information and where to put new data.

**Figure 3.1** Launceston City Council spatial data directory structure

Note the logical folder structure and naming convention in Figure 3.1. Personnel can quickly locate data by navigating the hierarchy of folders, guided by logical and meaningful naming conventions.
As shown in Figure 3.2, each of the directory’s folders has an attached description screen to ensure that the function and contents of the directory are clearly understood by users.

**FIGURE 3.2  Example of a description screen**

Many spatial information systems associate metadata (information about the spatial information) with the spatial data files and display them in a graphic form. Figure 3.3 illustrates the use of the Launceston City Council’s GIS by the council’s Parks Section, to manage the layout of stalls at City Park for the annual Festivale (Figure 3.4). This provided critical information that ensured the park would be protected during the event and that the health and safety requirements of visitors would be met.
**FIGURE 3.3** An example of metadata for the true data of a feature layer

**Festivale_Stalls_2007**
*Personal GeoDatabase Feature Class*

<table>
<thead>
<tr>
<th>Description</th>
<th>Spatial</th>
<th>Attributes</th>
</tr>
</thead>
</table>

**Keywords**
- Theme: Parks and Recreation, Planning
- Place: City Park, Launceston

**Description**
- **Abstract**
  Location of stalls in Festivale 2007

- **Purpose**
  To assist participants in Festivale 2007 in setting up their stalls in the correct location. To minimise danger from underground electrical services and damage to the sprinkler system. It also forms a record of the participants at the event.

**Status of the data**
- Complete
  - Data update frequency: Annually

**Time period for which the data is relevant**
- Beginning date and time: 1/10/07 at time 12:00AM
- Ending date and time: 1/10/08 at time 12:00AM
Another important reason for effective and efficient management of data is to ensure the continuity of the corporate knowledge base. Management practices in the form of standards, protocols and procedures are required so that others can find and use data. Lack of adherence to simple data management practices can cause major problems if staff changes occur and new operators are not familiar with the existing system. This can lead to data becoming lost, inaccessible or ‘sterile’, and therefore not usable, resulting in severely reduced value and return on investment.

Data management procedures should be robust, logical and well documented. Many spatial information systems come with integral tools to assist this process. Further, peak spatial data bodies such as ANZLIC and the Western Australian Land Information System (WALIS) have developed guidelines and templates that can be accessed and used.


The costs to councils of maintaining outdated or redundant datasets can be very significant. Councils that need to maintain data for historical purposes and for statutory archiving requirements need special archiving practices to reduce maintenance and storage overheads.

### 3.2.2 Key drivers for improved data management

There are many factors driving the need for improved data management, including:

- the desire by all councils to improve services for their communities and to use resources more effectively
- increased recognition that data collected at public expense must be properly managed so that they can be accessible to the public, in order to realise their potential and justify the considerable production and maintenance costs
→ increased desire from users for easier and quicker access to the right data and information, made available at little or no cost
→ increased focus within councils on the need to rationalise and integrate data, in order to improve efficiency, and add value and capability
→ increased requirements to safeguard intellectual property rights and to maintain confidentiality of sensitive data, affecting both council-owned data and data that councils acquire from external sources
→ compliance with statutory requirements.

**NOTE!** Regardless of the specific business context, those involved in producing and managing data will be judged on the ease with which the data and information are made available, and their quality. Those who are able to publish, share, access, integrate and use information are those who will benefit most.

### 3.2.3 Statutory requirements for data and information management

Councils within a particular state or territory may be required by law to manage and archive data in particular ways. For example, statutory obligations may be placed on the type, frequency and extent of archiving required. Given that these requirements vary across Australia, it is strongly recommended that councils contact the relevant jurisdictional records management agency to clarify any statutory requirements for data and information management.

**TIP!** Spatial data are a type of record, and spatial information management can draw much from general record-keeping practices. Excellent resources can be found at the National Archives of Australia website at http://www.naa.gov.au/recordkeeping/default.html. Councills can use the National Archives of Australia’s resources to guide their spatial information management practices.

In Western Australia, the *State Records Act (2000)* SRC Standard 1 on Government Recordkeeping requires that a Records Management Plan (outlining archiving practices) be produced by all government agencies, including all councils. The State Records Commission has produced a self-evaluation guide to assist users to develop their plans.

### 3.2.4 Benefits of good data management

**TIP!** Implementation of effective, rigorous data management policies and procedures ensures that data are treated as valuable and long-life assets. Implementing such policies and procedures yields many benefits. In general, the benefits of good data management are reflected in the following ways.

**Better decision-making**

Ready access to existing spatial data is essential for many decision-making tasks, such as development planning, asset management, security risk management, disaster mitigation and environmental protection.
Maximising use
Ready access to council data will encourage more extensive use of a valuable public resource for the benefit of the community.

Avoiding duplication
Duplication of effort can be reduced by sharing data needed by separate units and for different operations within councils or by more than one council. This can result in significant cost savings in data collection and maintenance. In addition, duplication of data often leads to variations in data standard and data conflicts.

Maximising integration
By adopting common standards for the collection, maintenance and transfer of data, enhanced integration of individual and often disparate databases is possible.

Custodianship
The identification of custodians for the principal datasets enables users to identify those responsible for implementing prioritised data collection programs, developing data standards and maintaining datasets.

Equity of access
A more open data transfer policy, founded on sound data management principles, ensures better access by the whole community.

Communications
Communications on many levels, including program goals, objectives and results, are enhanced.

Security
Data are accessed only by those authorised to do so, ensuring appropriate standards of probity and confidentiality.
Partnership and new business process opportunities.
Spin-off benefits may be created from providing new, and sometimes unanticipated, services to the community.

Opportunity
Better managed and organised data are more easily leveraged to new and unforeseen purposes through increased data accessibility and usability. This adds value by reducing data collection and management requirements and costs.

Identifying data usage trends
Data that fall out of use can be identified, and can then be archived and removed from the live spatial databases, thereby securing data integrity and reducing data management costs.

Avoiding data loss
Lost data represent lost value for an organisation. Data may be lost due to the erroneous storage [or filing] and inadvertent destruction of data [corrupted files and media]. Data losses present considerable costs and compliance risks to the organisation.
3.3 Principles of good data management

3.3.1 Data policy
The first step for any organisation wishing to implement good data management procedures is to define a data policy. A data policy is a set of broad, high-level principles that form the guiding framework in which data management operates. In most cases, these principles have been identified at national and state or territory level and can be readily transferred to local government. ANZLIC data management policies and procedures may be accessed at http://www.anzlic.org.au/policies.html.

See Section 3.4 for further information on establishing a data policy.

Ensure that business processes are reviewed to ensure compliance with the council’s documented data management processes, policies and procedures.

3.3.2 Data ownership
A key aspect of good data management is the clear identification of the data owner. All data, information and knowledge must have an ‘owner’. In most cases, the owner is the organisation which originally commissioned the data collection or database development, and has managerial and financial control of the data. The data owner commonly has legal rights over the data, including copyright and intellectual property rights. These may apply even where the data are collected, collated or disseminated by another party as part of contractual agreements.

Data ownership implies the right to exploit the data and, in situations where continued maintenance becomes unnecessary or uneconomical, the right to destroy the data. Ownership can relate to a data item, a merged dataset or a value-added dataset. Intellectual property rights can be owned at different levels. For example, a merged dataset can be owned by one organisation, even though other organisations own the constituent data. If the legal ownership is unclear, there is a risk that the data may be wrongly used, used without payment of royalty to the owner, neglected or lost.

Therefore, it is important for data owners to establish and document such elements as:

→ the ownership, intellectual property rights and copyright associated with the data, in order that they are safeguarded
→ the statutory and non-statutory obligations regarding data that are relevant to their businesses, to ensure that the data are compliant
→ the policies for data security, disclosure control, release, pricing and dissemination
→ agreements reached with users and customers on the conditions of use, in a signed memorandum of understanding or licence agreement, before data are released.

It is also important to ensure that data ownership information is included with the metadata and related data documentation.

Note that the owner of the data need not necessarily be the custodian of the data. The owner may delegate certain maintenance and management responsibilities to a data custodian. See Section 3.3.6 for the responsibilities of a data custodian.

### 3.3.3 Data documentation and metadata compilation

All datasets should be identified and documented to facilitate their subsequent identification, proper management and effective use, and to avoid duplicated collection or purchase of the same data.

A catalogue of data should be compiled to provide an accurate list of datasets held by a council. This catalogue will be a collection of discovery-level metadata for each dataset, in a form suitable for users to reference. These metadata should provide information about the content, geographic extent, currency and accessibility of the data, together with contact details for further information.

All business-related datasets, once catalogued, then need to be documented in a detailed form suitable for users to reference when using the data. These detailed metadata should describe the content, characteristics and use of the dataset, using a standard detailed metadata template.

**NOTE!** Good data documentation and metadata compilation and maintenance help to minimise loss of data. See Section 3.2.4 on the benefits of good data management.

### 3.3.4 Data quality, standardisation, harmonisation and audit

Good data management ensures that datasets can meet current needs and are suitable for further value adding. The ability to integrate data with other datasets (without time-consuming transformation and translating) is likely to add value, encourage ongoing use of the data and contribute to recovering the costs of collecting and maintaining the data.

To maximise the potential and use of datasets in councils, the following practices are recommended:

- use standard data definitions and formats
- define quality standards and apply the appropriate validation processes to each dataset
- ensure that data are quality assured and approved as fit for purpose before use or release
- encourage the use of appropriate state, territory, national and/or international data standards, particularly those that are relevant to geographic information.

**NOTE!** ANZLIC has developed a suite of interrelated policies and guidelines to assist organisations to achieve best practice in spatial data management, available at http://www.anzlic.org.au/policies.html. These include:

- Guidelines for Custodianship of Spatial Data
- Policy Statement on Spatial Data Management
- Metadata protocol and standard metadata profile
- Guiding Principles for Spatial Data Access and Pricing Policy
- Privacy Guidelines for Spatial Information
- Access to Sensitive Spatial Data.
3.3.5 Data lifecycle control

Good data management requires that the whole lifecycle of data is managed carefully. Data must be managed from the acquisition or creation phase through to the disposal stage. This may be a long time [and is indefinite for cadastral registers!].

Good data management includes:

- establishment of a business justification—this ensures that consideration is given to why new data are required (as opposed to existing data being amended), how data can be specified for maximum use (including the potential to meet other possible requirements), and why the costs of handling, storing and maintaining the data are acceptable and how they may be recoverable
- data specification and modelling, processing, database maintenance and security, to ensure that data will be fit for purpose and held securely in their own databases
- ongoing data audit, to monitor the use and continued effectiveness of existing data
- archiving, to ensure effective data maintenance until the data are no longer needed or are uneconomical to retain.

The data lifecycle policy can be formulated into a data lifecycle plan. Background information on data lifecycle management can be found on the Symantec website at http://www.veritas.com/van/articles/4435.jsp, among other sources.

3.3.6 Data custodianship

Several focal points for data collection, compilation and analysis may exist in a council or within a group of collaborating councils. Each group may have a role in managing the data beyond its responsibilities as a data owner.

An appointed group or position [not an individual, because the responsibility should stay with the position if an individual moves to another job] may be given formal responsibility by the owner to act as custodian of each major dataset. This group or position should be made responsible and accountable for the management and care of the data holdings under their control, in line with the defined data policy.

The rights and responsibilities of the custodian, as well as the rights and responsibilities of the data users, have been established by ANZLIC. The ANZLIC custodianship guidelines can be accessed from the ANZLIC website at: http://www.anzlic.org.au/get/2374980712. An extract from the guidelines is presented below.

The principles underlying custodianship include:

- trusteeship: the custodian does not ‘own’ data but holds them in trusteeship on behalf of the community
standard setting: the custodian, in consultation with sponsors and users, is responsible for defining appropriate standards and proposing them for ratification by sponsors and users.

- data maintenance: the custodian must maintain plans for information collection, conversion and maintenance in consultation with the sponsor and users.

- authoritative source: the custodian becomes the authoritative source for the fundamental dataset in its care.

- accountability: the custodian is accountable for the integrity of the data in its care.

- information collection: the collection or conversion of information can only be justified in terms of a custodian’s business needs.

3.3.7 Data access and dissemination

The ease with which data are made accessible and disseminated will depend on the data management, business and financial policies of the council. The following general principles are provided as a guide:

- public access to data should be provided where possible.

- access to data should be granted to customers and commercial organisations when the request is in line with the council’s policies and business strategy, and does not infringe on any copyright, intellectual property rights, or any statutory or non-statutory obligations related to privacy or other matters.

- the right to use or provide access to data may be passed to a third party, subject to agreed pricing and dissemination policies.

- different personnel within different sections of a council may have different access rights to data and information, depending on their work area and responsibility; user-specific views may be established by data managers to support these data access rights and limits.

- members of the public may have access to certain levels of data and information at the lowest level user view; an example would be spatial data accessed via the web through a map viewer, such as the data view available at a public access level for the City of Swan (see http://maps.cityofswan.com/intermaps50/).

3.4 Establishing a data policy

This section provides a guide to assist councils in establishing a data policy.

3.4.1 Data acquisition

All projects and activities that give rise to substantial datasets should establish at the outset whether suitable data already exist in a potentially usable form, or whether new data need to be acquired.

The costs and benefits of using existing data compared to newly collected data should be assessed.

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11 In this context, a sponsor is the section within a council (or the council within a group of collaborating councils) that has a special interest in ensuring that a dataset is widely available to users, and that has the structure and resources to oversee this process.
Prior to approval of data collection activities, the project must establish how data acquired will be exploited for maximum benefit, who will be responsible for full exploitation of the data, and how the benefits will be shared.

Subsequent data handling and storage needs must be considered, and plans put in place to ensure that databases are maintained in such a way that maximum advantage can be gained from the data.

Consultation should be carried out with relevant state or territory representatives to identify or determine the correct protocols, methodologies and classification procedures to use (in many cases, specific guidelines for data collection and management are available).

3.4.2 Fitness for purpose and point of truth

Prior to using a dataset, users should undertake an assessment to determine the appropriateness of the dataset for the intended use, or its fitness for purpose. This involves assessment of the dataset against criteria such as scale, resolution, accuracy, reliability, classification and integrity. In particular, the important attribute fields in the data should be checked to verify that they are appropriately populated with values (i.e. that they contain data).

Where possible, and especially where more than one version of a dataset exists, users should work with the relevant state or territory agencies to determine the authoritative, or point-of-truth, dataset. Problems may arise from using outdated, inaccurate or unofficial datasets, which can lead to major difficulties in analysis and a lack of interoperability and integration with other datasets. Further, the use of such datasets may cause doubts about data integrity.

3.4.3 Data care (custodial duties)

Data custodial duties include the following:

- databases should be managed closely, with clear responsibility for custodianship established, and accountability defined for ensuring data custodian procedures are followed
- data should be held securely in their own databases, with adequate provision made for their long-term care
- disaster recovery and backup procedures should be instituted
- all data should be validated and quality assured, prior to being used or archived
- easy access should be given to data holdings, both for staff and approved external customers and users
- data that are not required to be retained (for legal reasons or otherwise) should not be destroyed or put at risk without first exploring all possibilities for archiving (in compliance with state or territory record keeping legislation and council policy).
3.4.4 Data use and exchange

Key points regarding data use and exchange include the following:

- Memoranda of understanding or licence agreements should be established with users who receive data, addressing the subsequent use of the data.
- These should include confidentiality declarations and conditions of use and should reflect all statutory and non-statutory obligations.
- Intellectual property rights should be protected in relation to any development of information from the data, in formal memoranda of understanding or licence agreements.
- Adequate provision should be made for the widest possible public access to data and associated metadata.
- Pricing agreements should consider the cost of data collection, collation and management, and the cost of data and information recovery, in line with any council policies or overarching obligations that may apply.

3.4.5 Data security

The following should be noted:

- Councils will manage many data layers, which will contain data ranging from those which may be made public to those which are confidential.
- It is important that the council data policy allows the dissemination of data in accord with the level of access granted and the nature of the data.
- User-specific views may be established for council users or for approved external users, that grant access to certain data based upon a user’s approved level of access.
- The council may identify any ratepayers who have arranged that their names not appear on the Electoral Roll and then remove their identifying data from print-outs, maps, etc.

3.4.6 Data usage monitoring

The data custodian should be aware of who uses the different datasets and the needs of the data users to:

- Establish data usage patterns.
- Identify data that become unused—these data may eventually accumulate and may create ongoing storage and maintenance burdens; they should be identified and archived in compliance with state or territory record-keeping standards.
3.5 Implementing data management—key roles and responsibilities

To be successful, data management procedures must be implemented across the whole council, under the guidance of a member of the Executive Board or a data management steering committee.

It is good practice to identify a data management ‘champion’ at this level, who is prepared to take responsibility for this role and see it through.

Other key roles are those of the data policy manager and the data custodians assigned to key datasets.

The following information is provided to help councils establish these key roles and implement good data management policies and procedures. Data management procedures can be implemented as part of a data lifecycle management plan.

3.5.1 Data management ‘champion’

The data management ‘champion’ is responsible for:

- ensuring that policies on data management are in line with other council policies and overarching policies and obligations at a higher level (e.g. state or territory)
- directing the development, implementation and maintenance of the detailed data policies, standards, procedures and guidelines across the whole council
- reporting to management on the performance achieved against targets set for improvement in data quality, and on the value gained from effective data management
- maintaining a data management communication channel between users and management.

In some situations, especially those involving a number of sites where spatial data are being used or managed, a data management steering group or committee may also be beneficial.

3.5.2 Data policy manager

The data policy manager may require the help of local data managers to undertake the following tasks:

- developing and maintaining the data policy statement and other corporate guidelines
- appointing and monitoring the performance of data custodians
- issuing guidance and conducting training activities for staff
- ensuring that local practice in individual business areas meets the standards set for the whole council
- ensuring that the council maintains a central metadata resource.
3.5.3 Data custodians

Data custodians are responsible for ensuring that the following minimum standards are applied to each dataset:

- the dataset should be documented in a catalogue, following the standards for discovery metadata, to enable the ownership, intellectual property rights, custodian and accessibility factors to be determined and reported
- the policy for exploiting the dataset and making it available to other parties should be agreed and documented
- the dataset and its conditions of use should comply with all relevant statutory and non-statutory obligations, and any over-arching policies at the state or territory levels
- the data should follow standard classifications and data definitions where appropriate, and must comply with all relevant standards, codes of practice and other protocols
- the data should be fully validated and quality assured, with sufficient detailed metadata to enable their use by third parties without reference to the originator of the data
- the data should be stored, managed and accessed in line with agreed data management and security/confidentiality policies
- the release or use of data to internal and external users should require authorisation, and agreement to the conditions of use should be documented
- the costs and benefits of continuing to maintain the dataset should be reviewed periodically.

3.6 Data usage survey

A useful way to monitor the usage of spatial data by the council is to periodically survey spatial data usage patterns, identify data that are redundant to operational requirements, and identify new, emerging or anticipated data needs. The feedback from the survey will assist in data archiving, optimising data storage space, and planning for the acquisition and management of new data.

The nature of the survey may vary from council to council. The details, rigour and sophistication of the survey will vary with the complexity of the spatial data infrastructure of the council.

3.7 Data cleansing

‘Data cleansing’ refers to processes and procedures performed to maintain data integrity. These include establishing whether the data are:

- in the correct projection and datum
- correctly populated with attributes
- appropriately georeferenced
- topologically correct (i.e. relationships with other features are correct).
A nominated spatial information manager should be responsible for overseeing development and implementation of appropriate data-cleansing standards. The standards for maintaining ‘clean’ data may be part of the data policy.

### 3.8 Additional support

**NOTE!** Considerable information on data management policies is available from relevant state, territory and Australian Government agencies. The following web resources provide a useful starting point.

#### 3.8.1 National

#### 3.8.2 State and territory

#### 3.8.3 Information on data standards

*Module 4: Spatial data priorities, standards and compliance* provides additional relevant information on data management.
Acronyms

ACRES Australian Centre for Remote Sensing
ADAC Asset Design and As Constructed
AGD Australian Geodetic Datum
ALGA Australian Local Government Association
ANZLIC ANZLIC—the Spatial Information Council for Australia and New Zealand
ASDD Australian Spatial Data Directory
ASDI Australian Spatial Data Infrastructure
AS/NZS Australian Standard/New Zealand Standard
CAD computer assisted design, computer-aided drafting
CPU central processing unit
DSDB detail survey database
GDA94 Geocentric Datum of Australia 1994
GIS geographic information systems
GML Geography Markup Language, Generalised Markup Language
GPS global positioning system
GSDI Global Spatial Data Infrastructure
GUI graphical user interface
HTTP Hypertext Transfer Protocol
ICT information and communications technology
INCIS Integrated National Crime Information System (New Zealand)
ISO International Organization for Standardization
IT information technology
MGA Map Grid of Australia
OGC Open Geospatial Consortium
OGC-A Open Geospatial Consortium—Australasia
PRINCE Projects IN Controlled Environments
RCSC Regional Collaboration Steering Committee (Queensland)
RFP Request for Proposal
RIP raster image processor
ROC regional organisation of councils
SDE spatial database engine
SDI spatial data infrastructure
SEQ south east Queensland
SIDP Spatial Interoperability Demonstrator Project
SLIP    Shared Land Information Platform [Western Australia]
SOAP    Simple Object Access Protocol
URL     Uniform Resource Locator [website address]
VR0C    voluntary regional organisation of councils
WALIS   Western Australian Land Information System
W3C     World Wide Web Consortium
XML     Extensible Markup Language

NOTE: A list of several online spatial information system, GIS, cartographic, data and IT glossaries and dictionaries is provided at http://www.gis.com/whatisgis/glossaries.html. An additional online glossary for definitions of many current IT-related words is available at http://whatis.techtarget.com/.