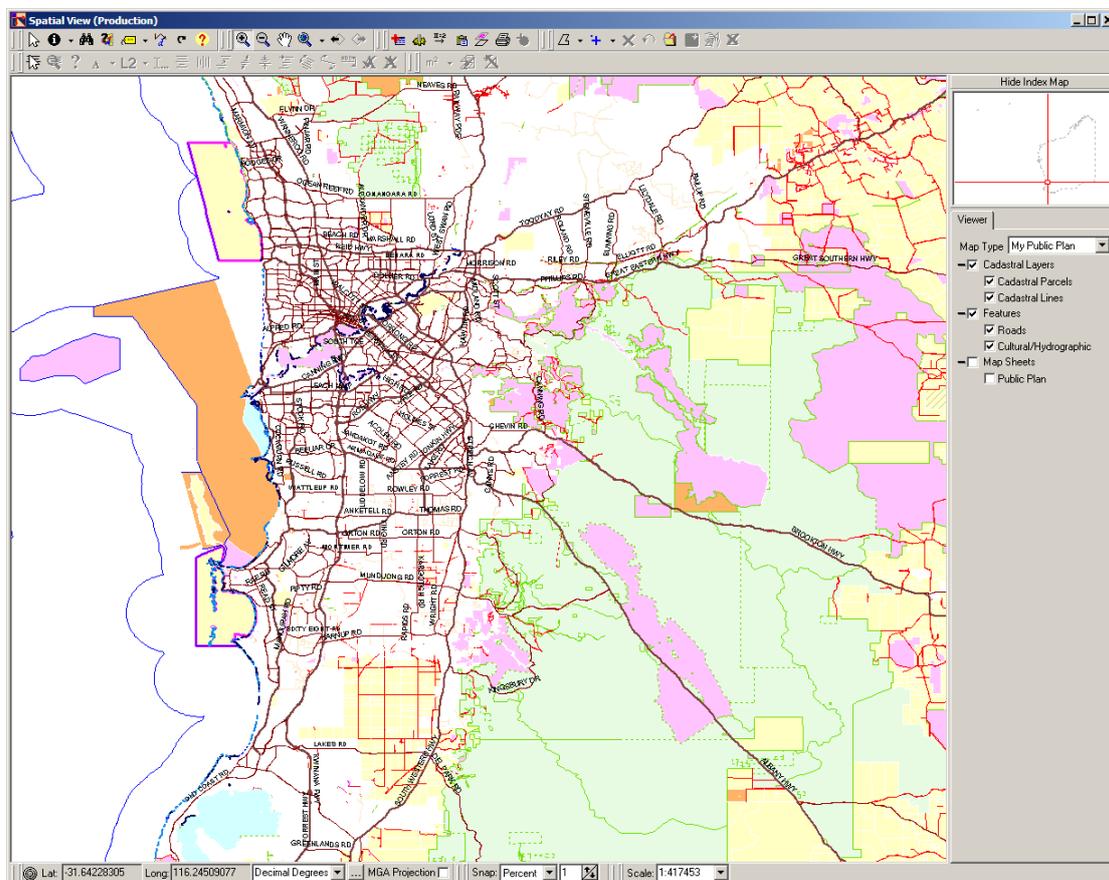


Spatial Cadastral Database (SCDB)

1 What is the SCDB?

The SCDB:

- is a seamless digital cadastral base map that contains land parcel boundaries and tenure information for all crown and freehold lands in Western Australia (WA).
- resides in Landgate's corporate/client server computing environment and is the hub of Landgate's major land information entities with numerous direct and indirect links to other key business systems and datasets.
- is the fundamental spatial dataset supporting the Land Title Register, ensuring that there is appropriate definition, identification, measurement and location of land ownership in WA.
- is the crucial underlying dataset supporting the Shared Land Information Platform (SLIP).
- serves a range of roles that support land taxation and valuation; land use planning and development; local government utilities and emergency management.



Sample of part of the State using SmartPlan to access the SCDB

(Colouring will be the same in MyLandgate Map Viewer)

2 SCDB General Details

Topology

The SCDB contains topologically related spatial data - points, lines, polygons, angles, azimuths, arcs and string constructs.

All spatial data elements in the SCDB have a unique identification number and textual attributes.

Polygon identification numbers provide a linkage to tenure datasets through a matching land identification number also stored against each polygon.

Linked tenure information includes property ownership, street address, title number, deposited plan number, land use, buying and selling information.

Cadastral Boundaries

The SCDB is for information purposes only and is not guaranteed to be free from anomalies. The information may be out-of-date and should not be relied upon without verification from the original sources. The original documents must be searched where the information is being used for legal purposes.

Cadastral boundaries have distances and angles attached to them and all land parcels have areas. For new subdivisions the survey dimensions and areas for land parcels have been automatically integrated into the SCDB from the digitally lodged surveys.

In the original digitised data the survey dimensions and (some) areas have been manually added to the SCDB through the spatial upgrade process.

In all other cases the dimensions are derived values calculated from the spatial coordinates within the database.

Administrative Areas

The cadastral boundaries and tenure data are linked to over 3,660 Administrative Areas.

The Administrative Area boundaries may stand alone, follow road centrelines or are linked to the cadastral boundaries using the "multiple attribute/single line principle".

There are currently 40 different types of Administrative Areas on the SCDB.

These types include Locality/Suburb (Postcode), Local Government Authority, Local Government Authority Ward, State Electoral District, State Electoral Region, State Border, Land District, Agriculture Area, Townsite (LA), State Forest, Marine Park, Marine Nature Reserve, Port Authority, Marine Harbour & Port, Railway Corridor and Native Title.

Administrative Areas are useful in identifying "areas of interest" for data extraction and demographic studies.

Waterline Data

This dataset contains interpretations of High Water Mark (HWM) as defined by the *Land Administration Act 1997* and Low Water Mark (LWM), where these lines form part of cadastral and administrative boundaries. The SCDB also includes an interpretation of a Water Line or "coastline" which is best described as the line of contact between the ocean/sea and the land – it logically sits in between HWM and LWM.

Data is sourced from the latest digital topographic data available or is interpreted from the best available ortho-rectified aerial photography. Data for the state coastal waters Three Nautical Mile Limit, together with the Twelve Nautical Mile Limit has also been included. Both are derived from the Australian Maritime Boundaries Information System (AMBIS) 2001 dataset.

SCDB Statistics

The SCDB is a dynamic database and is constantly growing. On the 15th November 2016 the SCDB contained the following numbers of data elements:

Point: 7,611,840

Line: 15,316,658

Angle: 15,874,935

Azimuth: 66,981

Polygon: 1,921,419

Land: 2,192,954

Data on the SCDB is organised by “Families”. These include the Cadastral, Reference, Control, Mines, Admin, Surround, Superseded and Lodged Families. It also includes the no longer used Temp Cadastral Control Family.

SCDB Spatial Accuracy

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On the 15th November 2016 the Cadastral Family contained 4,888,256 points of which around 91% are considered to be “spatially accurate” to the following criteria:

± 0.25 metres or better in urban areas.

± 2 metres in rural regions.

± 10 metres in pastoral regions

There is a known problem with “Point Co-ordinate Accuracy Statements” on the SCDB computed through the “Least Squares Adjustment” process. Propagation may not be occurring correctly and as a result there may be misleading “Point Co-ordinate Accuracy Statements” on the spatially upgraded data on the SCDB.

3 System Details

Computing Environment

The SCDB resides in Landgate’s corporate/client server computing environment, with data stored in an ORACLE relational database.

ESRI Spatial Data Engine (SDE) technology is used to efficiently access, manage and store the large volume of spatial data on the SCDB.

Internal Access – SmartPlan

Access to the SCDB for viewing, querying and maintaining the cadastral data is through an application called SmartPlan (SMP).

SMP access is restricted to Landgate. DMP and DoL have limited SMP access.

SMP Spatial Browse enables SCDB data to be viewed in a number of customised views, each displaying “layers” of spatial data selected by the user.

SMP also provides access to other related systems such as GESMAR (Geodetic Survey Marks Register) and GEONOMA (Geographic Names Database).

External Access (Viewing and Querying only)

External access to cadastral, tenure and aerial photography data is available through Landgate’s web-based MyLandgate and the Shared Land Information Platform (SLIP).

MyLandgate and SLIP display data stored in Landgate’s Dissemination database that is updated from the SCDB and SmartRegister on a nightly basis.

SCDB Maintenance

The SCDB is updated on a daily basis with new land subdivisions, modifications to existing Freehold and Crown land, the latest Waterline data and changes to Administrative Areas. The spatial position of data on the SCDB is constantly being improved through spatial upgrade.

Changes made on the SCDB will not be available in MyLandgate and SLIP until the following day after the overnight update of the Dissemination database.

SCDB Historical Data

Limited implementation only for Cadastral (points, lines & polygons) and Administrative (lines & polygons) families of data began in 2002. There will be no history data before this date and SmartPlan does not support a history back-capture function.

Historical data and superseded data are treated differently. Superseded data like parent lots and survey surrounds have an ongoing role in the current cadastre as opposed to historical data that does not. E.g. parent lots for building and survey strata subdivisions remain part of the current cadastre, unlike the parent lot in a “green title” subdivision which would go to history. Historical data is NOT included when the current SCDB families are spatially upgraded, which means that overtime it will not remain in alignment with current data.

4 SCDB Spatial Upgrade

To improve on the relative and absolute accuracy of the digital data on the SCDB, Landgate has been undertaking a program of spatial upgrade.

Over 22 years this program has changed from spatially upgrading the originally “Digitised” SCDB in PHASE 1 to ensuring the SCDB continues to remain “fit for purpose” in PHASE 2.

Spatial Upgrade History - Birth of the “Digitised” SCDB

The initial seamless digital cadastral base map was manually captured from Landgate’s analogue Public Plan series in the late 1980’s.

Over 5,500 Public Plans of various scales ranging from 1:2000 up to 1:500,000 were manually digitised.

The resultant “Point Co-ordinates” were assigned a derivation of “Digitised” and the accuracy achieved was no better than 1mm at map scale. E.g. 2 metres at 1:2000 and 250 metres at 1:250,000.

No “Surveyed Dimensions” were captured in the digitising process. The values on the lines and angles on the SCDB were mathematically derived from the “Point Co-ordinates” of the “Digitised” data.

Why improvement of the “Digitised” SCDB was required?

Since the birth of the “Digitised” SCDB stakeholder’s needs and expectations of digital data has grown.

While the initial capture produced a whole of State seamless digital cadastral database it was of limited spatial accuracy and intelligence.

There were also problems with alignment between the cadastre and other digital data sets.

Because of these limitations Landgate commenced a program of Spatial Upgrade over the SCDB to improve the relative and absolute accuracies of the Point Co-ordinates.

How improvement of the “Digitised” SCDB was achieved?

The measured dimensions for the angles, distances and polygon areas (from the Survey Plans and Field Books) were manually assigned to the “Digitised” data.

Cadastral Connections to the “Fixed” and positional accurate “Geodetic Network Points” were captured from the Field Books.

Road crossings (from the Survey Plans and Field Books) were captured to complete the network.

Next, a Least Squares Adjustment was completed to compute improved Point Co-ordinates on the SCDB based on the positional accurate “Geodetic Network Points” from GESMAR.

The stages of spatial upgrade have become known as PHASE 1 Spatial Upgrade and PHASE 2 Spatial Upgrade.

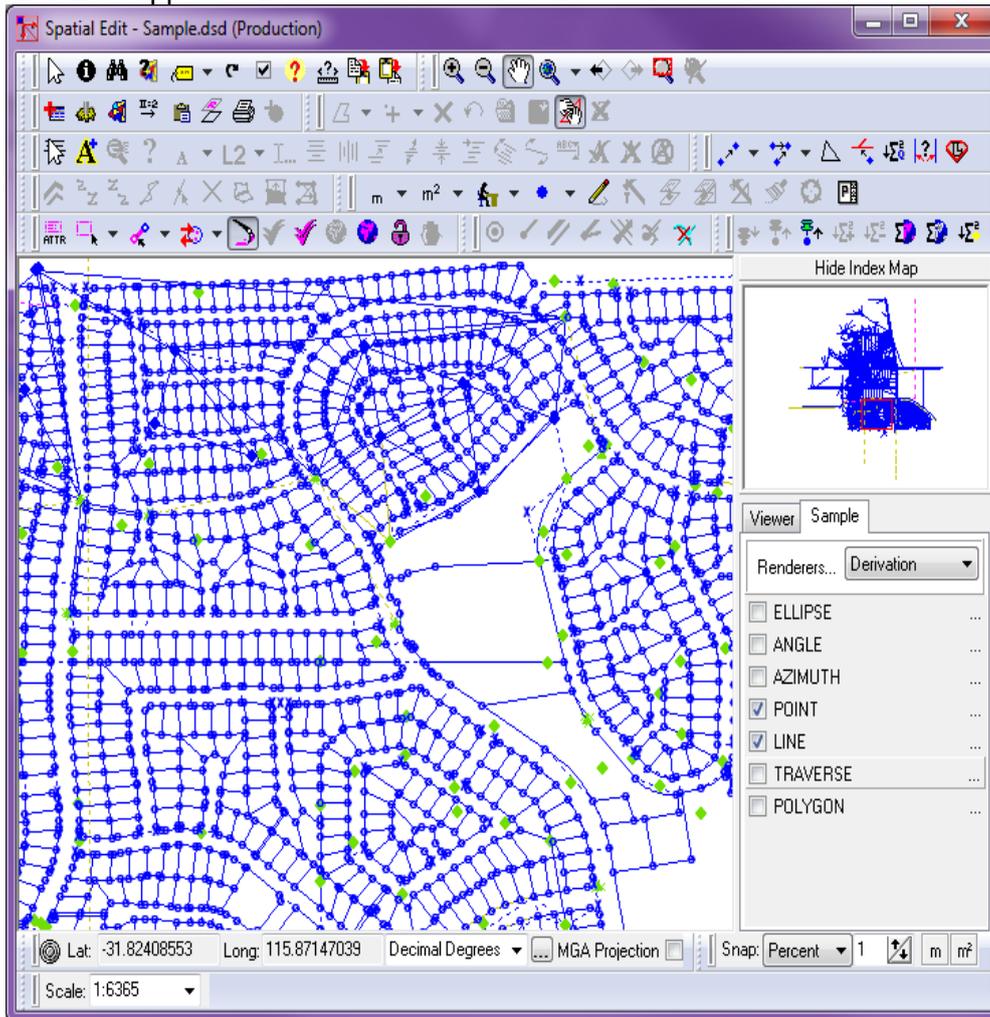
5 PHASE 1 Spatial Upgrade

PHASE 1 Spatial Upgrade of the SCDB is now considered complete.

PHASE 1 Spatial Upgrade was the total replacement of the “Digitised” data (angles, distances and polygon areas) on the SCDB with survey dimensions and then Least Squares Adjustment (LSA) to best fit the data with the “Fixed” and positionally accurate “Geodetic Network Points” from GESMAR.

The “Point Co-ordinate Accuracy” values of the “Fixed” and positional accurate “Geodetic Network Points” were set to zero on the SCDB.

RELATIVE Point Co-ordinate Accuracy Statements were computed on the SCDB through the PHASE 1 Spatial Upgrade Least Squares Adjustment Process.
PHASE 1 LSA appears “Blue” when viewed in “Derivation Mode”.



Sample of PHASE 1 Spatial Upgrade on the SCDB in “SmartPlan Derivation View”
(MyLandgate Map Viewer does not have a point derivation view,
this information must be obtained from individual point interrogation)

6 PHASE 2 Spatial Upgrade

PHASE 2 Spatial Upgrade of the SCDB commenced in November 2014.

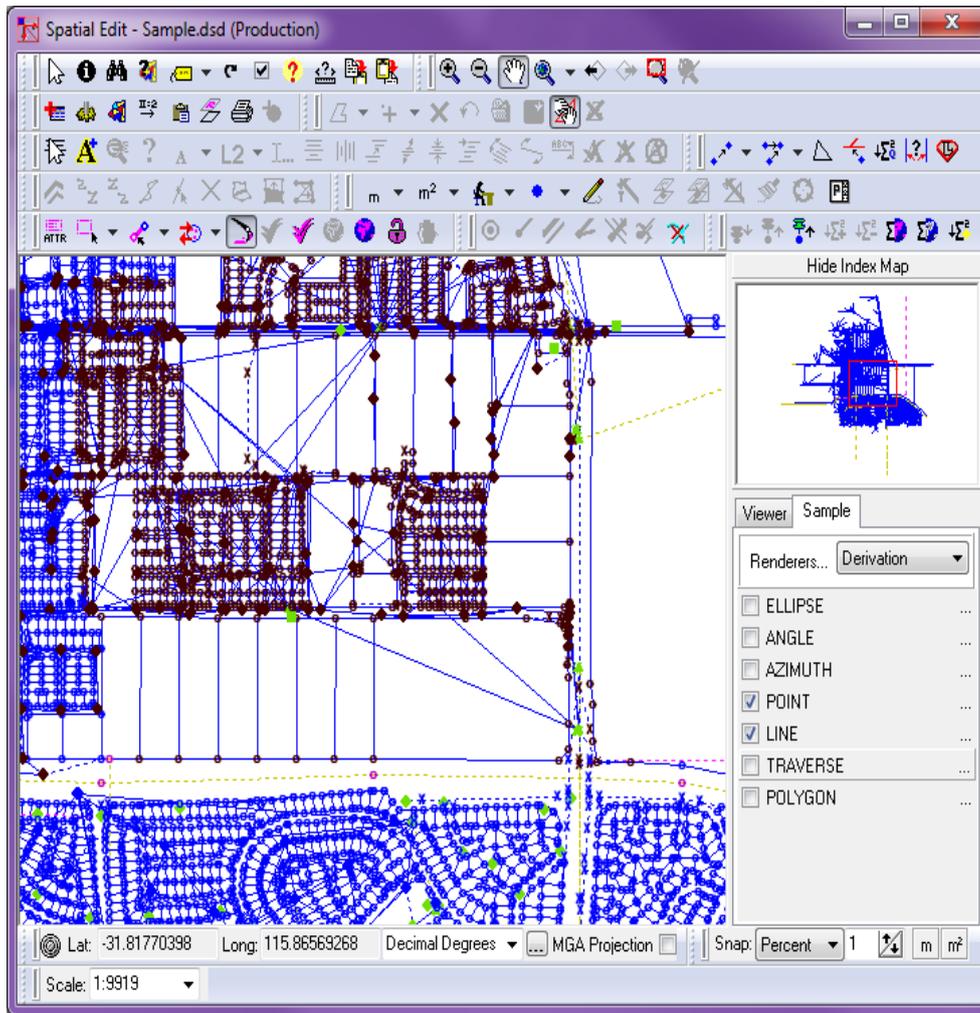
PHASE 2 Spatial Upgrade on the SCDB will be progressive and will take considerable time to complete the whole database.

In the process of a PHASE 2 Spatial Upgrade the “Point Co-ordinate Accuracy” values of the “Fixed” and positional accurate “Geodetic Network Points” will no longer be set to zero on the SCDB.

The “Point Co-ordinate Accuracy” values (or “Positional Uncertainty” values) will be propagated through from the GESMAR Database as the data on the SCDB is revisited.

ABSOLUTE Point Co-ordinate Accuracy Statements will be computed on the SCDB through the PHASE 2 Spatial Upgrade Least Squares Adjustment Process.

PHASE 2 Spatial Upgrade appears “Deep Purple”/“Black” when viewed in “Derivation Mode”.



Sample of PHASE 2 (and some PHASE 1) Spatial Upgrade on the SCDB in “SmartPlan Derivation View”
 (MyLandgate Map Viewer does not have a point derivation view, this information must be obtained from individual point interrogation)

7 Why do PHASE 2 Spatial Upgrade?

PHASE 1 Spatial Upgrade of the SCDB has taken over 22 years to complete. Technologies and methodologies have improved over that time.

The data now needs to be revisited for improvement and rectification to remain “fit for purpose” through being Current, Correct, Complete and Consistent.

The initial PHASE 2 Spatial Upgrade Work Program will follow the “Easement Back Capture” Program.

The first areas revisited in the PHASE 2 Spatial Upgrade Work Program are the Local Government Areas of Subiaco, Belmont & Armadale.

There is also some PHASE 2 Spatial Upgrade occurring in the control networks of newly developed residential and industrial areas.

8 SCDB Digital Data Anomalies

To report any anomalies found with the digital SCDB Data:

Complete our [Customer Feedback Form](#) located on the Landgate Website under “Contact Us”

or

Call Landgate on 1300 365 288
 Option 5 - General Enquiries

9 For Supply of Digital Data

Digital SCDB Data is ordered through Landgate's Geospatial Products and Services Section. Customers can order digital data extracts in a number of different formats. For information on availability of data and digital formats contact:

Geospatial Products & Services

Landgate

Telephone: (08) 9273 0724

E-mail: geodata@landgate.wa.gov.au

10 SCDB Spatial Upgrade Requests

Requests for spatial upgrade of the SCDB can be made through the Western Australian Land Information System (WALIS) State Capture and Advice Register (SCAR) - Capture WA.

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