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**Information Paper**

**Draft Mesh Blocks**

**Australia**

**2005**



New  
Issue

**Information Paper**

**Draft Mesh Blocks**

**Australia**

**2005**

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**Acting Australian Statistician**

AUSTRALIAN BUREAU OF STATISTICS

EMBARGO: 11.30AM (CANBERRA TIME) FRI 9 SEP 2005

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## PREFACE .....

The Australian Bureau of Statistics (ABS) has embarked on an ambitious program of work to establish a new approach to statistical geography which will put geographically referenced statistics on a whole new footing in Australia.

This work has included the development of a new micro level of geography – the Mesh Block – and a comprehensive infrastructure for assigning a house, farm, factory or business to its correct Mesh Block based upon its street address.

This paper describes how Draft Mesh Blocks 2005, which were published in the CDROM product ABS (cat. no. 1209.0) , were created and some of the difficulties which were encountered.

Criteria for designing Mesh Blocks were defined by a Panel of Experts in 2003. The criteria were published in March 2004 and were refined and amended in response to public comments. Every attempt has been made to create Mesh Blocks true to those criteria but even the best of national spatial databases cannot be completely authoritative and up to date with human activity in rapidly developing parts of Australia. The purpose of this paper is to seek comments on the Draft Mesh Blocks from statistical and spatial data users who may have knowledge of local conditions that was not available to the ABS during the design process.

Feedback on the draft boundaries for Mesh Blocks will be an important input to the usability and long-term stability of Mesh Blocks. Responses should reach ABS prior to 31 December 2005.

Please address replies to:

Post:

Director, Geography  
Australian Bureau of Statistics  
PO Box 10  
Belconnen ACT 2616

Email:

<geography@abs.gov.au>

Fax:

(02) 6252 8666

Peter Harper  
Acting Australian Statistician

## **ABBREVIATIONS** .....

<b>ABS</b>	Australian Bureau of Statistics
<b>APA</b>	Australian Population Association
<b>ASGC</b>	Australian Standard Geographical Classification
<b>CD</b>	Collection District
<b>DCDB</b>	Digital Cadastral Data Base
<b>G-NAF</b>	Geocoded National Address File
<b>GIS</b>	geographic information system
<b>LGA</b>	local government area
<b>PSMA</b>	Public Sector Mapping Agencies
<b>SLA</b>	statistical local area



ABOUT THIS PUBLICATION

This paper describes the development of a new micro level geographical unit, the Mesh Block, which is intended to become the basic building block of all statistical, political and administrative geography in Australia.

Criteria for designing and building Mesh Blocks were first defined by a Panel of Experts in 2003. These criteria were published in *Information Paper Mesh Blocks Australia 2003*, ABS (cat. no. 1209.0). The criteria were further refined in response to feedback on that information paper. The refined criteria were published in a paper presented to the 12th Biennial Conference of the Australian Population Association (APA) held in Canberra in September 2004. The hierarchy is reproduced in Appendix 1.

In creating 350,000 Mesh Blocks to cover all of Australia the ABS has relied heavily on the advances made over the last decade in GIS technology and digital topographical data. In particular the launch on 2 March 2004 of PSMA Australia's G-NAF has enabled both the development of Mesh Blocks and the coding of address information to those Mesh Blocks. Even the best of national spatial databases, however, cannot be completely authoritative and up to date with human activity in rapidly developing parts of Australia. Some Draft Mesh Blocks will inevitably have been created based on topographical features which no longer exist or will not have allowed for major new features because they were not represented in the PSMA national datasets at the time.

The design criteria adopted for Mesh Blocks are quite robust in that, despite the limitations of the available spatial data on which they are based, they almost always result in micro regions which are very good, if not ideal, for most applications. It is important for the long-term use and stability of Mesh Blocks, however, that any major departures from the design criteria are detected before Mesh Blocks are utilized in the 2006 Census of Population and Housing and other major statistical collections. The ABS acknowledges that there are many stakeholders in the Mesh Block initiative and that some of those stakeholders have access to local information which was not available to the ABS during the creation of the Draft Mesh Block boundaries. This paper seeks feedback from individuals and organisations on whether the draft boundaries are true to the design criteria in the parts of Australia which those individuals or organisations know best.

Mesh Blocks will be maintained and published on an annual basis. The normal growth of Australia's cities and towns and changes in land use will be captured in the annual maintenance cycle. The intention is that once Mesh Blocks are finalised for the 2006 census, this maintenance will only involve the splitting of an existing Mesh Block into two or more new Mesh Blocks. The ABS anticipates that for the Draft Mesh Blocks 2005, however, there will be cases where some redesign will be required to accommodate valid feedback from stakeholders. The intended one to many relationship between old and new Mesh Blocks in each annual edition will only apply after the 2006 Edition.

RESPONSES TO THIS  
PAPER

Comments on the Draft Mesh Blocks, Australia, 2005 are welcome and are invited from all interested parties. Responses should be in the form provided in Attachment A and should be sent to reach the ABS prior to 31 December 2005.

Please address replies to:

Post:

Director, Geography  
Australian Bureau of Statistics  
PO Box 10  
Belconnen ACT 2616

Email:

<geography@abs.gov.au>

Fax:

(02) 6252 8666

Based on the results of this consultation, the ABS may amend, further subdivide or aggregate the Draft Mesh Blocks to form Mesh Blocks Australia 2006 to be published in July 2006.

AIMS OF THIS PAPER

The aims of the paper are to:

- re-state the criteria against which Draft Mesh Blocks have been created;
- make clear the limitations of the Draft Mesh Blocks 2005 digital boundaries dataset published in ABS (cat. no. 1209.0)
- seek detailed feedback on cases where, given the stated limitations, the Draft Mesh Blocks 2005 still do not meet the stated design criteria.

Geographical boundaries can be a very emotive issue and it is very likely that a boundary drawn anywhere or around anything will invoke some degree of dissent. In the case of Draft Mesh Blocks every single boundary could be re-drawn to include something previously excluded or vice versa. The ABS has used a highly automated process to create Mesh Blocks which within the limitations of the available spatial data are true to a given set of criteria. Those criteria were in turn developed by an independent Panel of Experts and have been the subject of considerable consultation. The ABS is not in a position to change the criteria at this time. Neither is it seeking to change the Draft Mesh Block boundaries in cases where there is some degree of discretion in the application of the criteria. Stakeholders are being asked to comment on the compliance of individual Draft Mesh Blocks with the stated criteria.

Obviously individual stakeholders are not in a position to validate all Mesh Block boundaries for all of Australia. Some stakeholders will however have very detailed knowledge of small parts of Australia. Others will have knowledge of major changes to the landscape such as the construction of a new highway or the redevelopment of a housing or industrial area.

ITEMS FOR FEEDBACK

The specific items on which the ABS seeks detailed feedback are:

1. any Draft Mesh Block which is bisected by an impassable natural or man made feature ie. part of the Mesh Block is disconnected from other parts;
2. any Draft Mesh Block which is likely to contain between 5 and 20 dwellings;
3. any Draft Mesh Block, excluding high density residential areas, which is likely to contain much more than 60 dwellings;
4. any major development ie. a shopping mall, major transport corridor, high rise residential development, a school or hospital, etc, which warrants the creation of a specific Mesh Block but has been missed in the Draft boundaries;
5. the location of pockets of population within an otherwise unpopulated Mesh Block ie. an accommodation area within a National Park, a group of 30 or more dwellings within an industrial area
6. any large rural Mesh Block which contains a population cluster of more than 30 dwellings which has not already detected and bounded.

THE DESIGN CRITERIA

The design criteria developed by the Panel of Experts were published in *Information Paper Mesh Blocks* (cat. no 1209.0). After receiving feedback from interested stakeholders these criteria were refined into an operational hierarchy on which a work flow and software tools were developed. This hierarchy was published in a paper presented to the *12th Biennial Conference of the Australian Population Association* (APA) held in Canberra in September 2004. The hierarchy is reproduced in Appendix 1.

It will be noted that there are different criteria for urban versus rural areas. The first requirement in the design process was therefore to split urban areas from rural areas. In this context however urban and rural are not defined in the same way as they are in the ASGC ie. the Linge Criteria. When designing Mesh Blocks the urban criteria were applied to all Urban Centres and Localities (See ASGC ABS cat. no. 1216.0 ) plus any other identifiable cluster of more than 30 dwellings. The primary purpose is to distinguish clustered population from dispersed population so as to design Mesh Blocks which are, wherever possible, internally homogenous in terms of population density.

During the design and construction of the Draft Mesh Blocks every attempt was made to adhere to the criteria shown in Appendix 1 but practical imperatives dictated that not all criteria were able to be met at all times. In particular there was often a direct conflict between the requirement to maintain a minimum number of dwellings (30) in each Mesh Block versus other criteria from further down the priority list.

During the design and build it was found that only very rarely could the hierarchy of criteria be applied beyond priority 16 in urban areas and priority 11 in rural areas (See Appendix 1). In fact it was often found that even highly ranked criteria like rural locality boundaries conflicted with the requirement for an urban/rural split and a minimum dwelling count.

Where conflicts between criteria occurred a trained GIS operator ultimately made a decision based on the order of priority of the criteria. Such decisions were often made with little supporting evidence about dwelling numbers and land use or in the face of conflicting evidence from multiple sources. Fortunately, however, the basic concept of a Mesh Block is quite robust and while there may be any number of permutations and combinations for resolving conflicting criteria any or all of them will result in Mesh Blocks that are perfectly fit for purpose. Interested stakeholders are requested to be mindful of this when reviewing Mesh Block boundaries. While any number of Draft Mesh Block boundaries could be drawn differently, the magnitude of the task dictates that only the specific items numbered 1 to 6 in Ch 2 will be incorporated in the 2006 Edition.

Please note that at the beginning of the design and build the minimum areas for water features in urban and rural areas were amended from those published in the APA Paper

## THE DATA USED

Draft Mesh Blocks Australia 2005 were created using a suite of GIS software tools developed by the ABS specifically for the purpose. The topographic data which underpins the Mesh Block boundaries is stored in an Oracle Database and was accessed by up to eight GIS operators using MapInfo Profession clients. The Mesh Block boundaries and associated attributes were created initially on local hard drives before being uploaded to a single Oracle table.

The topographic and other spatial data used were:

- PSMA Australia national datasets
  - Coastline
  - Roads
  - Railways
  - Major Water
  - National Parks
  - CADLITE
  - Points of Interest
  - Administrative boundaries - suburbs and localities
  - G-NAF
- ABS SLA boundaries
- Planning/zoning scheme data for each state/territory

Planning/zoning scheme data was supplied by each state/territory in most cases by the Planning Authority. These data were in the case of some states/territories a single fully integrated and consistently attributed dataset while in the worst case they were provided as separate files for each local government area with little or no consistency between zone categories across local government areas. The ABS where necessary consolidated the files for each state/territory then mapped the land uses to a highly generalised set of land uses.

The ABS acknowledges that these planning data represent only a theoretical or planned land use and there will be many cases where actual land use is quite different to the planned land use. An alternative would have been to use the Australian Land Use Mapping (ALUM) datasets which are available or becoming available for most states/territories. However it was found that ALUM was not available over the major urban areas. In rural areas it contains a lot of detail in both spatial disaggregation and land use categories which the Mesh Block creation process was not able to deal with in a meaningful way.

A planned or theoretical land use has several advantages over a physical land use in terms of stability and for flagging change in the future. However, the Mesh Block category shown in the Draft Mesh Blocks 2005 boundary dataset is not designed to provide a definitive land use mapping. It is purely an indicator of the main planned land

## THE DATA USED

*continued*

use for a Mesh Block. For example a Mesh Block categorized as Industrial will in most cases contain some residential population. The planned land use category has only been used, like the urban and rural split, to achieve greater internal uniformity of population density ie. to separate the consistently populated area from the sparsely populated area.

## CREATING MESH BLOCKS

The above data were downloaded to the operator's computer and processed one SLA at time. This meant that the operator physically could not create a Mesh Block which crosses an SLA boundary. This in turn ensures that Draft Mesh Blocks 2005 aggregate precisely to SLAs. However for logistical and data management reasons Draft Mesh Blocks 2005 aggregate to ASGC 2006 Edition SLAs, not ASGC 2005.

Once all data for an SLA is downloaded the GIS software subsets the SLA into urban and rural areas and then intersects the data layers relevant to each to form a first cut of Mesh Blocks. The software then determines the estimated number of dwellings in each Block and the operator merges the ones that are too small (less than 30 dwellings) or further divides the large ones.

Unfortunately, everywhere except South Australia and the Sydney basin<sup>1</sup>, the only indicators which the ABS has of dwelling numbers are:

- the dwelling count for each CD at the 2001 Census;
- the number of cadastral parcels; and
- the number of G-NAF address points.

Mesh blocks do not aggregate to CDs and the ABS has no indicators from the last census of how the population is distributed within a CD. Neither a cadastral parcel nor a G-NAF address necessarily represent a dwelling. In rural areas many land parcels belong to a single owner and there are many fewer dwellings than there are parcels. G-NAF addresses can be a home, a business or just a vacant allotment. G-NAF also includes a large number of duplicated addresses where it has not yet been possible to link together, as aliases, different versions of the same address.

After considerable experimentation the ABS decided to use a subset of G-NAF addresses (only those geocoded at the parcel level) as the primary indicator of dwelling numbers. This estimate was further refined by using the planned land use data to restrict the dwelling count to G-NAF address points which fall in residential zones. The number of dwellings in each Draft Mesh Block estimated in this way is, at best, unreliable and will remain so until dwellings have been counted at the 2006 Census. For this reason the ABS erred on the side of caution with respect to the size of Mesh Blocks. Some may prove to be too small and will have to be merged after the 2006 Census but many are likely to be large enough to be further subdivided once dwelling counts are known. In the mean time, interested stakeholders who can confirm that particular Draft Mesh Blocks contain considerably more than 60 dwellings are invited to do so.

While the initial intersection of data layers is highly automated, the aggregation of small Mesh Blocks and the further subdivision of large ones represents approximately 8 person years for this first edition of Draft Mesh Blocks.

<sup>1</sup> Planning SA (Department of Primary Industries & Resources) and Sydney Water provided their mapping of dwellings to the ABS for the Mesh Block design.

## CHAPTER 5

### THE LIMITATIONS OF DRAFT MESH BLOCK DIGITAL BOUNDARIES .....

#### WHAT DOES CDROM CAT. NO. 1209.0 CONTAIN

The CDROM contains digital boundaries in ESRI Shape and MapInfo table formats for Draft Mesh Blocks 2005 covering all of Australia with the exception of Other Territories (Christmas Is, Cocos Is and Jervis Bay) and some of Rural NSW. The missing areas will become available and will be released on the ABS website.

All Mesh Blocks are closed polygons. Attributes for each polygon are:

- MB\_Code
- MB\_type
- MB\_Category

The data are unprojected GDA 94 latitudes and longitudes.

Also included on the CDROM is a copy of this Information Paper.

Mesh Block boundaries are intended to be free or available at the marginal cost of transfer. They can be copied and passed on to third parties without incurring royalties to the ABS. Where they are passed to a third party the ABS should be acknowledged as the custodian and the boundaries should be clearly described as Draft Mesh Blocks, Australia, 2005.

#### THE LIMITATIONS OF DRAFT MESH BLOCKS 2005 DIGITAL BOUNDARIES

As described in Ch 4, Draft Mesh Blocks 2005 were created by intersecting various data layers largely but not entirely sourced from PSMA Australia. Other data sets such as planning schemes do not necessarily align with the PSMA national datasets. Even within the PSMA data, layers do not always align with each other. For example a suburb boundary which is intended to run along the centreline of a road may not exactly coincide in position with that road centreline. An ABS SLA boundary which is also meant to be the centreline of the road may not coincide with either the suburb boundary or the road centreline.

This lack of vertical topology within and between datasets requires a great deal of time and effort to be expended to eliminate gaps and overlaps and various other artifacts from the Draft Mesh Block boundaries. However, if Mesh Blocks are to be incorporated in the 2006 Census, stakeholders' recommendations must be received before January 2006 and incorporated into the Mesh Blocks boundaries before July 2006. The *Information Paper: Draft Mesh Blocks* as published in (cat. no. 1290.0.55.001) are a good representation of what the final Mesh Blocks will look like but the ABS acknowledges that they are not of the same topological quality as other ABS digital data products.

#### TOPOLOGY OF BOUNDARIES

Every effort has been made in the construction process to eliminate gaps and overlaps between the Mesh Blocks. These topological problems will be addressed in future editions through a comprehensive maintenance regime currently being developed by the ABS.

VERTICAL TOPOLOGY

The topological relationship between Mesh Blocks and other spatial data is further complicated by the data update regime which was in place during the design and build. In theory Mesh Blocks should align (in a vertical topological sense) to the PSMA national datasets including CADLITE. For most state/territory government users this means that they will also align with the spatial data sets most commonly used by state/territory government eg. cadastre and road centrelines. However during the construction phase (October 2004 to August 2005) the ABS received quarterly updates of most critical datasets from PSMA Australia. In order to make use of the most recent data, Mesh Blocks have actually been constructed from three different editions of PSMA roads, major water and CADLITE. Within any one state/territory Draft Mesh Blocks will overlay a single edition of the PSMA national datasets but which edition will vary from state to state.

While the above topological issues will not be visible to users who view the boundaries at scales up to 1:5,000 or even larger, stakeholders who might use relatively sophisticated GIS techniques to examine and validate the Draft Mesh Blocks should be alert to these internal topology and vertical topological issues.



HOW TO PROVIDE  
FEEDBACK

Feedback on the Draft Mesh Blocks 2005 should reach the ABS before 31 December 2005. Comments and recommendations must be provided on the form at attachment A. The form can be faxed or e-mailed:

Post:

Director, Geography  
Australian Bureau of Statistics  
PO Box 10  
Belconnen ACT 2616

Email:

<geography@abs.gov.au>

Fax:

(02) 6252 8666

Stakeholders who wish to provide alternative boundary designs and additional spatial data to support their recommendations can do so by providing diagrams printed on A4 sized paper clearly showing the boundaries and MB\_Code of each Draft Mesh Block affected by the proposed change and the proposed alternative boundaries.

Diagrams of proposed changes can also be provided electronically in GIF, TIF or Adobe Acrobat .pdf format or in GIS format:

- MapInfo tables; or
- ESRI Shape files;

In unprojected latitudes and longitudes, GDA 94 datum. Unless provided in GIS format, diagrams must include a graphic scale bar.

When examining or validating the Draft Mesh Blocks, stakeholders are asked to make allowances for the topological issues discussed in Ch 5 and to focus on the six areas for feedback listed in Ch 2.

Recommendations provided in digital form must be accompanied by a completed Attachment A identifying which of the six feedback items applies to each proposed change. Recommendations for an alternative design will only be adopted where the Draft design, due to lack of information or operator error, has substantially departed from the design criteria.

For practical and strategic reasons Mesh Block boundaries will in future be aligned to the PSMA Australia national datasets. Proposals which effectively 'shift' Mesh Blocks to align with a local datum or a specific spatial data resource cannot be accepted.

Recommendations in diagrammatic or GIS format should associate proposed boundaries with the name of a topographic feature so that the ABS can adopt that feature as represented in the PSMA national dataset. For example if a recommendation is to create

HOW TO PROVIDE  
FEEDBACK *continued*

a new Mesh Block bounded by four streets the names of the streets should be shown on the diagram or included as attributes of the feature in the GIS data.





URBAN DESIGN CRITERIA

Feature (Criteria)	Priority	Comment
Polygons		Mesh Blocks will be formed by commencing with the highest priority region and subdividing or excising other regions where they exist in the priority order shown
Confidentiality Protection	1	Mesh blocks should be either zero dwellings or minimum 30 dwellings
Local Government Areas (LGA)	2	Required for time series
Statistical Local Areas (SLA)	3	Required for time series but minor adjustments may be made to SLA boundaries which are not LGA boundaries.
Suburb/Locality	4	Official gazetted boundaries only
Contiguity	5	MBs must be a single contiguous area except for islands which may be grouped together but not combined with a mainland area
Major Parkland exceeding 5 hectares	6	Parkland may include any public open space and any sporting arena or facility whether enclosed or open to the public including racecourses, golf courses and stadiums. But will not include any housing incorporated into a golf course, etc.
Major facility	7	Hospitals, universities etc which occupy large areas of land and extend across both sides of a city street or have an in internal road network. The resulting MBs will be categorised as per Land Use below.
Water body exceeding 0.5 hectares. Amended to 5 hectares	8	Excluding water bodies entirely enclosed within 6 or 7 above
Transportation corridor (Freeway, rail corridor)	9	Road and rail may be combined into a single MB if separated only by park/reserve or other minimal use land.
Town Blocks	10	Road and railway centrelines (not included in 9 Above) will be intersected with each other and with the higher priority polygons to form Town Blocks (Tbs).
Land Use		TBs will be tested for different land uses within the same TB and subdivided accordingly. It may not be feasible to separate all land uses. The following priority will apply.
Residential	11	Highest priority is to separate residential from other land uses
Minor Parkland	12	Any "reserved" land greater than 0.5 hectares in area, not included in 6 above.
Industrial	13	Where zero population MBs can be defined
Commercial	14	Where zero population MBs can be defined.
Education	15	May contain population in Non-private dwellings
Hospital/medical	16	Mixed landuse will be treated as residential
Journey to Work Destination Zone	17	the commercial area immediately surrounding a railway station or bus depot
Railway station or other transport node precinct	18	All MBs, with the exception of 8 above, will consist of one or more whole
Land parcel	19	land parcels plus a share of the adjacent road casement where appropriate, ie. where a parcel adjoins a road the MB boundary may include all or part of the road casement/reserve. Where the above subdivision of areas has occurred but a polygon can be further divided and still meet criteria 1 the following linear features should be used in priority order
Dividing features		Surface water management area
River basin boundary	20	
Electoral Boundary	21	
Railway	22	not being a water body as in 8 above
River, creek	23	to facilitate time series
Collector District (CD) boundary	24	
Australia Post Postcode boundary	25	Mesh blocks should adhere to the following shape criteria in priority order
Shape, size and area		there should be no barriers to accessibility within a MB ie. all parts of the MB
Connectivity	26	accessible from within the MB following significant frontages i.e. Ocean, rivers, lakes, transport corridors
Linear/parallel	27	Homogeneous experience of local infrastructure eg walkability
Compactness	28	doughnut shapes are acceptable
Doughnut	29	where known, eg public housing separated from private housing
Socio-economically homogeneous	30	Where a single apartment block, etc, containing more than 30 dwellings can be
High density housing	31	identified the parcel or parcels containing it may be made a separate MB, subject to 19 above but where the MB is a compact shape, of homogeneous land use, not intersected by any other boundary there is no requirement to subdivide it further even if it contains much more than the minimum number of dwellings.

RURAL DESIGN CRITERIA

Feature (Criteria)	Priority	<b>Comment</b>
Polygons		Mesh Blocks will be formed by commencing with the highest priority region and subdividing or excising other regions where they exist in the priority order shown
Confidentiality Protection	1	Mesh blocks should be either zero dwellings or minimum 30 dwellings
Local Government Areas (LGA)	2	Required for time series
Statistical Local Areas (SLA)	3	Required for time series but minor adjustments may be made to SLA boundaries which are not LGA boundaries.
Locality	4	Official gazetted boundaries only
Contiguity	5	MBs must be a single contiguous area except for islands which may be grouped together but not combined with a mainland area
Parkland, nature reserve and other minimal use protected or conserved area exceeding 10 hectares	6	Parkland may include any uninhabited land reserved or conserved for any purpose. But will not include any housing or accommodation incorporated into a park, etc.
Water body exceeding 5 hectares. Amended to 50 hectares.	7	Excluding water bodies entirely enclosed within 6 above
Land Use Residential/lifestyle agricultural other	8 9 10	Eg , Defence sites and other Commonwealth land, major facilities, etc.
Transportation corridor (Freeway, rail corridor)	11	Road and rail may be combined into a single MB if separated only by park or other minimal use land. In rural areas transportation corridors will only be delineated where they form a major accessibility barrier or are a significant area of alternate landuse.
Land parcel	12	All MBs, with the exception of 7 above, will consist of one or more whole land parcels and, where information is available, one or more whole properties (ie parcels in the same ownership), plus a share of the adjacent road casement where appropriate, ie. where a parcel adjoins a road the MB boundary may include all or part of the road.
River basin boundary	13	Surface water management area. Except where a SWMA runs through a large area of National Park or Sate Forrest, etc, the SWMA boundary will be adjusted to include whole land parcels or properties
Dividing features		Where a polygon can be further divided and still meet criteria 1 the following linear features should be used in priority order
Biogeographical Regions	14	Generally IBRA but regionalisations compatible with IBRA will be considered where they exist
Topographical barriers	15	Mountain range (ridge top) or escapement which presents a barrier to accessibility where not already defined by 7 above
Electoral Boundary	16	
River, creek	17	Not being a water body as in 7 above
Valley perimeter	18	Where not already defined by 7 or 15 above
Highland/lowland	19	Where not already defined by 15 or 18 above, high or steep country should be separated from low or level lands
Railway	20	
Major road	21	Freeway, expressway or dual carriage way significant enough to form a barrier to accessibility between properties on either side.
Collector District (CD) boundary	22	for time series
Australia Post Postcode boundary	23	
Minor road	24	Not a cul-de-sac
Shape and area		Mesh blocks should adhere to the following shape criteria in priority order
Connectivity	25	there should be no barriers to accessibility within a MB ie. all parts of the MB accessible from within the MB
Linear/parallel	26	following significant frontages i.e. Ocean, rivers, lakes, transport corridors
Compactness	27	Homogeneous experience of local infrastructure eg walkability
Doughnut	28	doughnut shapes are acceptable



## FOR MORE INFORMATION . . .

- INTERNET* **www.abs.gov.au** the ABS web site is the best place to start for access to summary data from our latest publications, information about the ABS, advice about upcoming releases, our catalogue, and Australia Now—a statistical profile.
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