



Southern Tasmania Regional Land Use Framework

Background Report No.13: Dwelling Yield
Analysis

Prepared by GHD Ltd

(FINAL DRAFT)

March 2010



This document is detailed supporting information for the Regional Land Use Framework for Southern Tasmania.

While every responsible effort has been made to ensure that this document is correct at the time of printing, the State of Tasmania, the Southern Tasmanian Councils Authority, the 12 Southern Councils and the Sullivans Cove Waterfront Authority, its agents and employees, disclaim any and all liability to any person in respect of anything or the consequences of anything done or omitted to be done in reliance or upon the whole or any part of this document.

Please visit www.stca.tas.gov.au or telephone the Southern Tasmanian Councils Authority on 61 3 6270 2242 with any queries.





Contents

1.	Introduction	1
1.1	The Project	1
1.2	The Study Area	1
2.	Previous Dwelling Density Assessments	3
3.	Methodology	5
3.1	Overview	5
3.2	Rationale for Sample Size	5
3.3	Assumptions	5
3.4	Data Preparation	7
4.	Results	9
4.1	Understanding the results	9
4.2	Sample results overview:	15
5.	Key Findings and Recommendations	18
6.	References	19

Table Index

Table 1	Comparison of Previous Density Studies	4
Table 2	Summary of potential additional dwellings by LGA	10
Table 3	Market Segments and Location Type	14
Table 4	Sample Densities and existing density	16
Table 5	Location Characteristics	24
Table 5	Market Segment Price Range	25
Table 6	Market segment classification	26

Figure Index

Figure 1	Study area and residential zones	2
Figure 2	: Assessment Process	6
Figure 3	Proportion of overall development by suburb and zone (see over page)	11
Figure 4	Market Segments	12



Figure 5 Location Characteristics	13
Figure 6 Increase in dwelling density by suburb and zone (see over page)	15
Figure 7 : Assessment Process	33

Appendices

- A LGA, Suburb, Zoning, location characteristic, market segments and potential number of additional dwellings (see spread sheet)
- B Guidelines for assessment
- C Market Segments
- D Methodology



1. Introduction

1.1 The Project

The Southern Tasmanian Councils Authority (STCA) has engaged GHD to investigate potential dwelling yields of existing residentially zoned land for the Greater Hobart area. This investigation forms part of a background reporting component to Phase 1 of the Southern Tasmania Regional Planning Project and will be used to assist in the development of a regional land use framework and associated settlement and investment strategies.

The Demographic Change Advisory Council and the Residential Advisory Council of Australia indicate that over the next 25 years an additional 30,000 houses will be required in the Greater Hobart area due to population growth.

The purpose of this investigation is to identify the potential dwelling yields within the Greater Hobart area, and thereby provide an indication of the capacity of existing zoned areas to meet the required additional dwellings. As part of the settlement strategy of the Regional Land Use Framework, the capacity of existing zoned areas and subsequent need to identify future growth is a priority.

The tasks undertaken to identify a potential dwelling yield include:

1. Conducting a review of previous housing density studies for the Greater Hobart area.
2. Developing and applying a consistent methodology to determine potential dwelling yield of all existing residentially zoned land assessed to be available for residential development in the Greater Hobart area (excluding all government land, with the exception of Housing Tasmania land and other State Government land specifically identified by STCA Joint Project Managers for review).
3. Mapping or tabulating dwelling yield potential within the Greater Hobart area by zone, location characteristics, market segment and Local Government Area (LGA).

The potential dwelling yields are a theoretical estimate of the number of additional dwellings that can be developed under existing zoning and planning scheme standards. As such the development potential assessment does not take into account servicing, access, physical constraints other than those identified under the existing scheme standards. Nor does it take into consideration the likelihood of full development potential being realised, or other residential land supply and demand factors such as historical growth patterns.

1.2 The Study Area

The study area comprises the Greater Hobart area extending from, Dysart in the north, Granton in the west, Snug in the south and the Southern Beaches in the east. The investigations relate to existing residentially zoned land within the metropolitan areas of Brighton, Clarence, Derwent Valley, Glenorchy, Hobart, Kingborough, Sorell, and Southern Midlands LGAs. This area is shown in Figure 1. For the purposes of consistency across the study area, the residential zonings in each planning areas are grouped into the equivalent Common Key Elements Template zone.

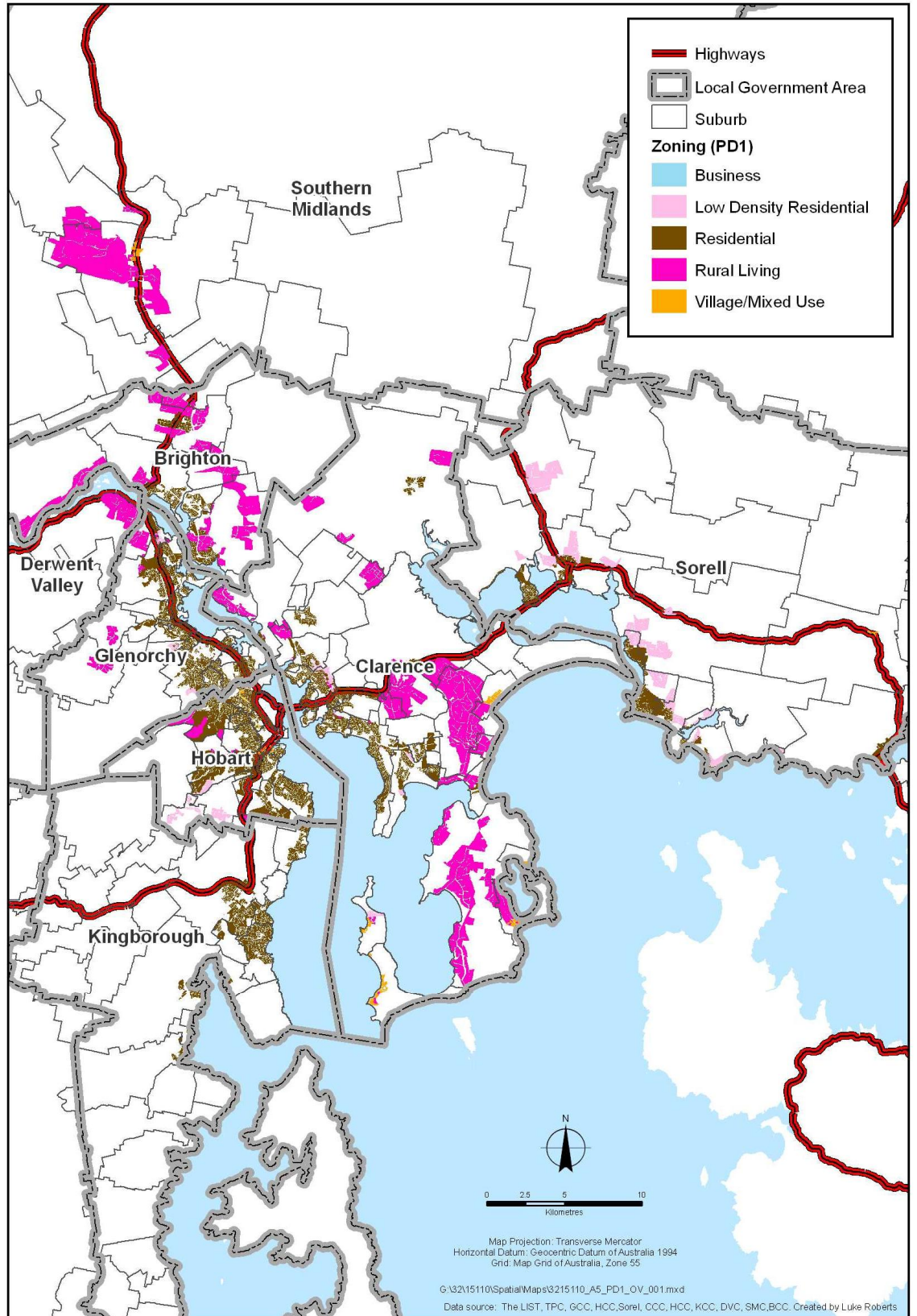


Figure 1 Study area and residential zones



2. Previous Dwelling Density Assessments

The following Councils in the Greater Hobart region have undertaken analysis of growth projections and the dwelling capacity of existing residential zoned areas in their LGAs:

- ▶ Hobart City Council (HCC), Report on Residential Development Potential, Population and Dwellings, March 2006
- ▶ Clarence City Council (CCC): Connell Wagner, Clarence Residential Strategy, April 2008
- ▶ Glenorchy City Council (GCC), Residential Land Supply & Demand, Planning Scheme Review – Topic Papers (Draft), April 2008. .

In addition, the Department of Environment and Land Management's 'Future Urban Development and Infrastructure Provision in Greater Hobart' (Hogue, S. March 1996) has also been considered. This has been considered because it considers potential development in the Greater Hobart area.

The methodologies and assumptions employed in these analyses vary as detailed in Table 1. Methods to calculate potential dwelling density and yield vary from simple gross density calculations of the zone / locality area divided by minimum lot size or "ideal density" (such as 10 dwellings/ hectare) to more complex net calculations. The net calculations sampled residential parcels for their ability to be developed, removing a proportion of the land (ranging from 10% - 17.5%) in consideration of infrastructure, circulation and public space.

Under the previous studies the calculation of potential lot yield and dwelling yield has been completed using two broad methods. Hogue 1996 and Clarence 2008 apply a housing density ratio of 10 dwellings per hectare to identify the number of potential dwellings while the HCC 2006 and GCC 2008 have applied minimum lot sizes to the potential dwelling numbers. GCC 2008 examined the potential for infill and development of vacant lots to understand the number of potential dwellings able to be developed in each locality. It is noted that the results from the DELM study are from 1996 and that there have been a number of zoning changes have occurred in the intervening 14 years that would date the results.

Previous studies also examined residential land supply and demand factors such as historic subdivision and building rates and population growth statistics to determine the estimated number of years of residential land supply. These factors are to be considered in the subsequent development of the settlement strategy under the Regional Land Use Framework,

.

Table 1 Comparison of Previous Density Studies

Previous Report	Purpose	Land Assessed	Dwelling Density Calculation	Assessment Criteria	Assumptions/Exclusions	Residential Potential
Hobart City Council	Identify potential dwelling/lot yield and estimate number or years of land supply	All land within Residential precincts under the City of Hobart Planning Scheme 1982	lot area divided by the dwelling unit factor and/or minimum lot size under the Scheme	Vacant land Developed land with infill capability. Zone Suburb	17.5% for services allowance for lots > 1ha Lots in Residential 2 Zone have gradient >20%	2965 dwellings, equivalent to 21 years land supply.
Clarence City Council	Examine residential land supply and demand Recommend an urban growth boundary Provide direction on the type of development	All residential zoned land under the previous Planning Schemes	lot area divided by the density of 10-15 dwellings/ha	Vacant land Suburb Market segments Market demand location characteristics		9920 lots, equivalent to 71 years of future housing stock.
Glenorchy City Council	Examine residential land supply and demand	Sampling through a combination of random (vacant) and targeted (developed land). Residential zoned land under the Glenorchy Planning Scheme 1992	Based on scheme	Vacant land Developed land with infill capability. Zone Suburb	Scheme Conditions	2566 lots or 3409 dwellings (inclusive of multiple dwellings potential), equivalent to 21 and 38 years land supply
Department of Environment and Land Management	Describe population growth, land supply and demand. Examine impacts of future developments on infrastructure provision	All land zoned	lot area divided by the density of 10 dwellings/ha	Vacant land only (i.e. no infill)	80990 existing houses across the 8 LGAs	20967 lots

3. Methodology

3.1 Overview

This assessment utilises a randomised sample of 5% of land within each suburb and zone (under the common key elements template) to estimate a theoretical potential dwelling yield for infill and vacant land. The potential dwelling yield is determined by assessing if each parcel is able to be developed under the appropriate planning scheme. If the parcel is considered appropriate, then number of potential lots is calculated based on the minimum lot size standard under the relevant planning scheme. The potential density for the sample is then applied to the total area for the zone and suburb representing the maximum number of dwellings able to be developed under theoretical conditions. The results give a clear picture of the potential dwelling yield within the Greater Hobart region based on the existing planning scheme standards.

The assessment process steps and assumptions are illustrated in Figure 2. The assessment required under Step 3 was undertaken by GHD and Council planning officers in accordance with the guidelines in Appendix B, A more detailed method for purposes of explanation of the GIS data collection, preparation, and analysis is given in Appendix D.

3.2 Rationale for Sample Size

The sampling process includes a randomised sample of all parcels in the study area, though the random placement of points over the parcels to the value of 5% of the total parcels available, . By randomising the sample, an independent selection of parcels is created, including infill and greenfield (vacant land) developments, this process removes any potential bias in the selection of samples, minimising but not removing the potential of over or under sampling of parcels that could not be developed further.

3.3 Assumptions

The following assumptions have been applied to the methodology:

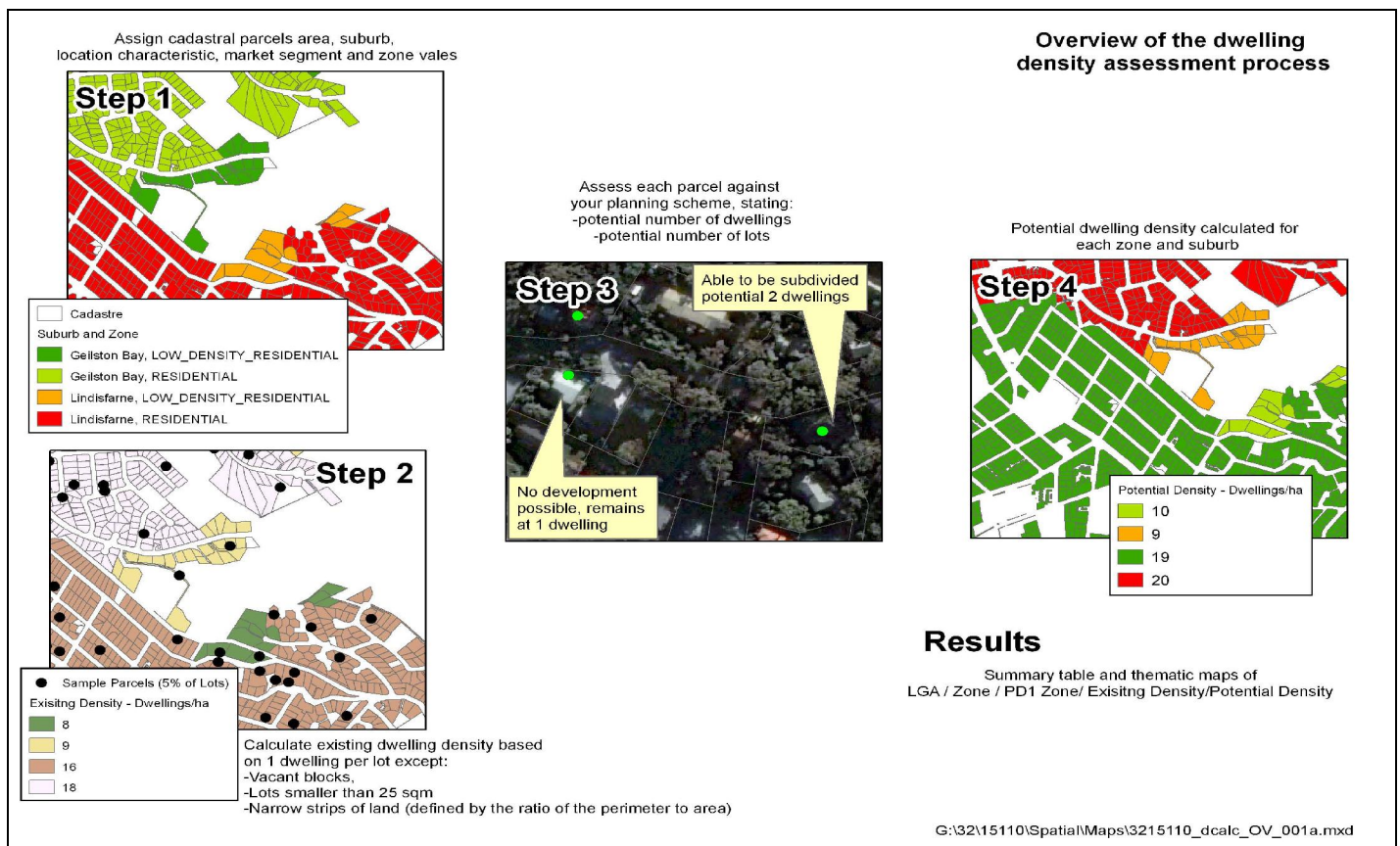
- ▶ All lots able to be developed are considered 'vacant' irrespective of whether they have an existing dwelling or not. Accordingly, the task does not require any assumptions for developed land regarding the percentage of lot that is required to be retained for any existing dwelling.
- ▶ Lots within one or more of the identified Constraining Planning Scheme Overlays (see Appendix c) were not assessed because they were incapable of development to full potential.¹
- ▶ Roads, easements (drainage, rights of way etc.), schools, churches, cemetery's, sporting fields, Federal, State and Local government land (with the exception of Housing Tasmania land and specified State Government land identified by STCA joint project officers for assessment) within the study area were removed.
- ▶ The existing dwelling density and number were based on the assumption of 1 dwelling per parcel (apart from exceptions noted in Section 3.4).

• ¹ It is noted that more detailed assessment of development potential was undertaken as part of previous dwelling yield assessments. Given the regional scale, and project scope constraints, this level of assessment was not feasible option for this project.

The following additional factors were also applied to provide consistent analysis across the Greater Hobart area:

- Residential zones under each planning scheme were grouped into the equivalent zoning under the Common Key Elements Template pursuant to Planning Directive No. 1 (PD1).
- Market segments grouped by suburb

Figure 2 : Assessment Process





3.4 Data Preparation

The following data sets and assumptions have been used for the data preparations:

1. VisTas 30/11/2009:

- ▶ Data set contains land use, number of dwellings, construction year and vacant or developed.
- ▶ Joined to cadastre using Property Identification (PID).

2. Residential zones and Planning Directive 1 (PD1) merged zones:

- ▶ Each council supplied the GIS dataset of their planning scheme.
- ▶ Residential zones identified and extracted based client direction.
- ▶ For simplicity the 31 residential zone types have been grouped into the PD1 zone types of residential, rural living, village/mixed use, low density residential, and business, as advised by the STRPP project managers.
- ▶ PD1 equivalents applied to the zones.

3. Local Government Area Boundaries (the list, November 2009):

- ▶ The name of the LGA is applied to the cadastre to assist in sampling and reporting.

4. Suburb Boundaries (the list, November 2009):

- ▶ Form the smallest reporting area when intersected with the zoning.
- ▶ Market segment values applied at the suburb boundary as categorised in Appendix C

5. Slope (the list, November 2009)

- ▶ Created slope % based on the 10m contours set.
- ▶ Two regions created <20% and >=20%.
- ▶ Samples assessed against slope, with parcels greater than 20% considered to be at their development potential.



6. Cadastre (the list November 2009):

- ▶ The cadastre was classified into its location characteristic to enable reporting on location type and dwelling potential.
- ▶ Attributed with VisTAS data including dwelling number and occupancy (Vacant/Occupied)
- ▶ Existing density was calculated (number of dwellings/area).
- ▶ Parcel types identified in the cadastre as roads, easements (drainage, rights of way etc.), schools, churches, cemetery's, sporting fields, Federal, State and Local government land (with the exception of Housing Tasmania land) were removed from consideration as being less likely to be developed.
- ▶ The existing dwelling density and number were based on the assumption of 1 dwelling per parcel with the following exceptions:
 - Non strata multi dwelling parcels identified were given an existing dwelling value identical to VisTAS,
 - Body corporate strata land was given an existing dwelling value of zero,
 - Parcels with a slope greater than 20% have been considered to be at full development potential,
 - Land identified as being vacant in VisTas data were given an existing dwelling value of zero, and
 - Parcels with a perimeter greater than area, were less likely to be able to hold dwelling were given an existing dwelling value of zero.



4. Results

The results are supplied in two sections the first being the regional results for potential dwelling yield, the second section outlining the results from the sampling process. The LGA based results can be found in the appendices as maps, and the associated GIS shape file.

Section 4.1 provides the results at the regional level including:

- ▶ Existing dwelling density / number,
- ▶ Total land area and land area assessed (hectares),
- ▶ Maximum theoretical lot/dwellings per hectare, shown as a increase from existing,
- ▶ The potential number of dwellings and lots in residentially zoned land,
- ▶ The proportion of Greater Hobart's potential additional dwellings in each suburb and zone,
- ▶ Reporting of potential dwellings for each suburb and zone into market segments and location characteristics.

Section 4.2, reviews the sampling results.

All results are based on the GIS layer "GH_DYA_Results_20100208.shp".

4.1 Understanding the results

Across the Greater Hobart region the total number of potential dwellings is 34619, the distribution of this is shown in Figure 3 Of note is that Brighton and Glenorchy in the northern end of the study area, contain half of the potential dwellings, Clarence, Kingston and Sorell contain the majority of remaining potential additional dwellings. Southern Midlands and Hobart City have a small amount of potential growth, with the majority of additional parcels available on currently vacant land.

Table 2 Summary of potential additional dwellings by LGA

LGA	Vacant/ Occupied	Existing Dwellings	Potential Additional Dwellings	Area (ha)
Brighton		5180	10771	2289.93
	Occupied	5180	7663	1870.71
	Vacant	0	3108	419.22
Clarence		20818	4820	6365.30
	Occupied	20818	2615	5711.45
	Vacant	0	2205	653.85
GCC		19487	8610	1860.84
	Occupied	19487	6350	1647.35
	Vacant	0	2260	213.49
HCC		22267	984	2532.56
	Occupied	22267	62	2180.90
	Vacant	0	922	351.66
KCC		9338	5037	1058.30
	Occupied	9338	3493	942.56
	Vacant	0	1544	115.74
Sorell		5282	3944	2248.58
	Occupied	5282	2189	1759.86
	Vacant	0	1755	488.71
Southern Midlands Council		391	453	2069.71
	Occupied	391	411	1788.57
	Vacant	0	42	281.14
Grand Total		82763	34619	18425.23

Figure 3 shows the spatial distribution of potential dwellings as a percentage of the total number of dwellings in Greater Hobart. Of note are the four growth areas of:

- Brighton – Bridgewater – Old Beach



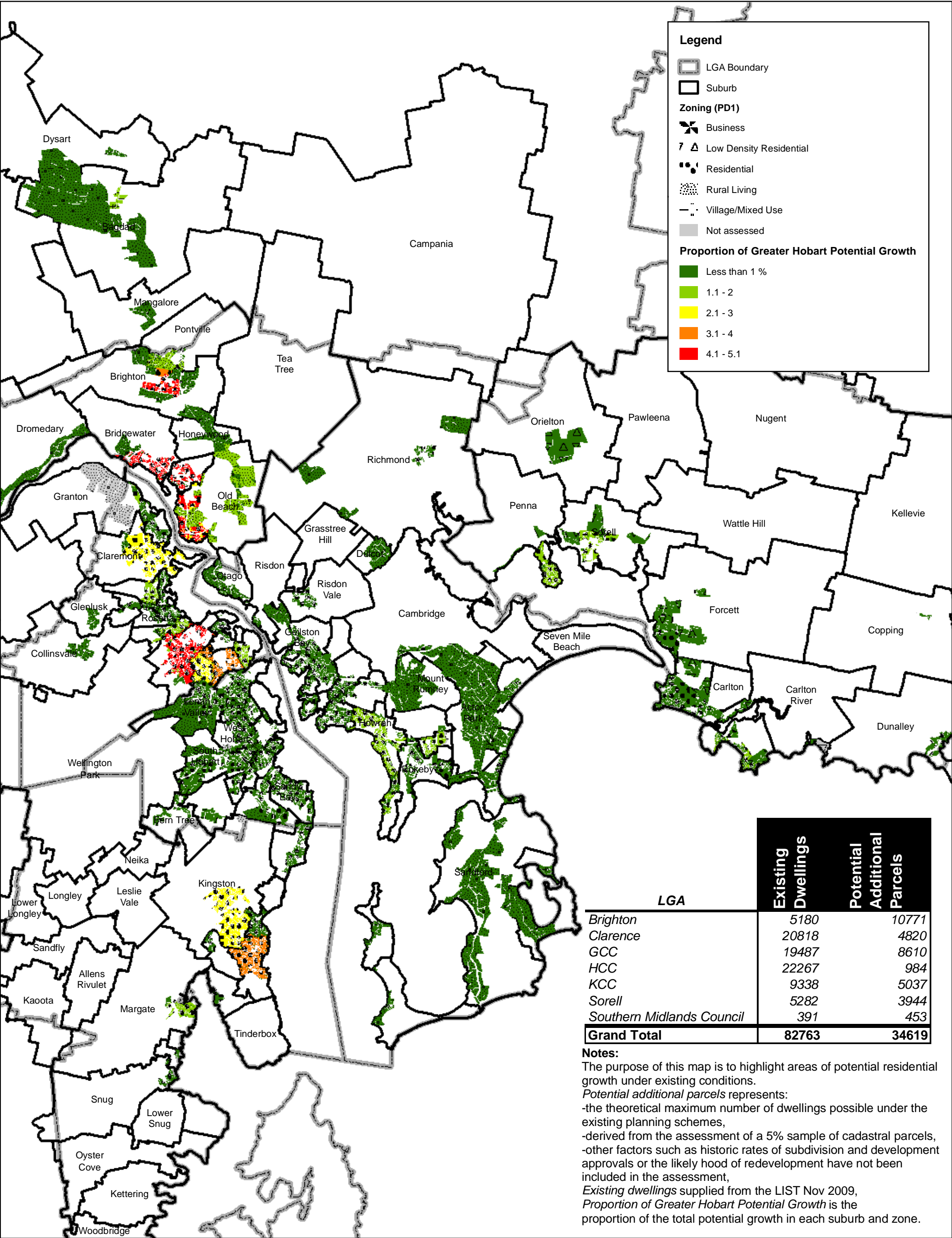
- ▶ Claremont
- ▶ Glenorchy – Moonah
- ▶ Blackman's Bay - Kingston

The growth regions with the exception of Brighton-Bridgewater-Old Beach (on the urban fringe) are located in the urban/inner urban location types centred on the business centres of Kingston and Glenorchy, while still being a considerable distance from the Hobart CBD. Of note is the low potential for additional dwellings in the inner urban areas around the Hobart CBD.

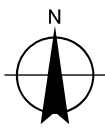
Figure 3 Proportion of overall development by suburb and zone (see over page)

Market segments and location characteristics are displayed in Figure 4 and Figure 5 with breakdown of potential dwellings outlined in Table 3. The market segments tend to have the upper areas concentrated on the inner urban suburbs of Hobart City with the exception of the coastal locations of Trammere and Kingston Beach. The middle/top market segments are largely located in the Kingborough, Clarence and Hobart. The lower and middle/lower market segments are distributed across the council areas of Brighton, Glenorchy, Sorell and Southern Midlands Council. Table 3 describes the potential dwelling yield results by market segments, when considered in the context of Figure 4 and Figure 5 the following broad trends are noted:

- ▶ The potential growth in the lower market segment is on the urban fringe and concentrated in the Brighton - Bridgewater area.
- ▶ The potential growth in the middle/lower market segments shows the largest potential for growth, distributed across the study area. Concentrated in the northern urban areas of Claremont, Glenorchy – Moonah, the urban fringe of Old Beach and in the south around Kingston.
- ▶ The potential growth in the middle/upper market segment occurs in the urban areas of Glenorchy – Moonah, Howrah, Blackman's Bay and Sorell. With coastal villages south of Kingston including Margate and Snug demonstrating potential growth.
- ▶ The upper market segment has the smallest potential growth, concentrated in the urban area of Trammere, with a low growth potential in the inner urban areas of Hobart.
- ▶ Rural living locations do not show a large potential for growth in any of the market segments with the exception of the middle/lower market segment, concentrated in the northern suburbs of Old Beach and Pontville.



1:200,000 (at A3)
0 1,000 2,000 4,000 6,000 8,000
Metres
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55



Southern Tasmania Regional Planning Project
Greater Hobart Dwelling Yield Assessment

Job Number | 3215110
Revision | A
Date | 7/2/2010

Greater Hobart Dwelling Yield Assessment

Proportion of overall increase by Suburb and Zone

Figure 4 Market Segments

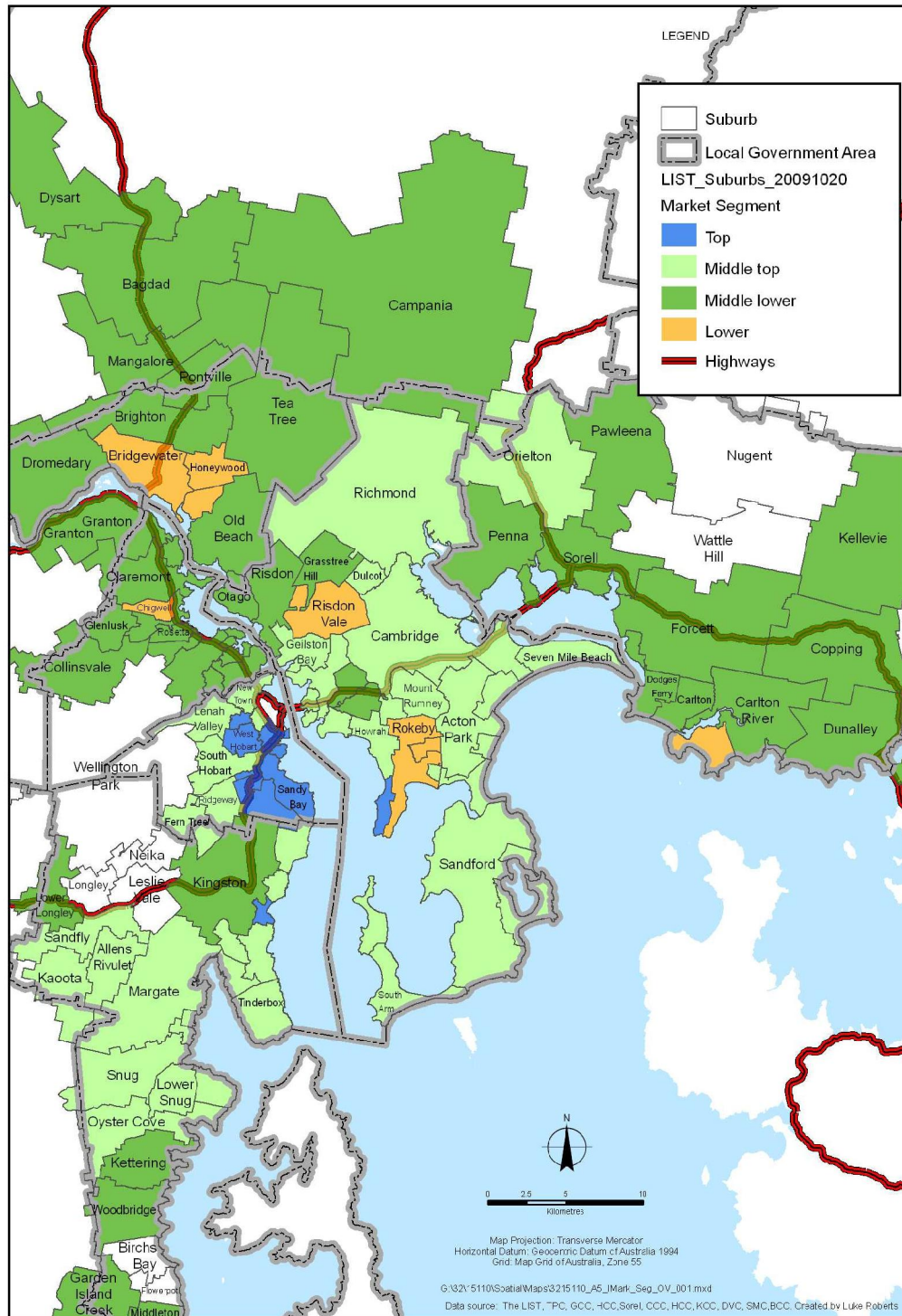


Figure 5 Location Characteristics

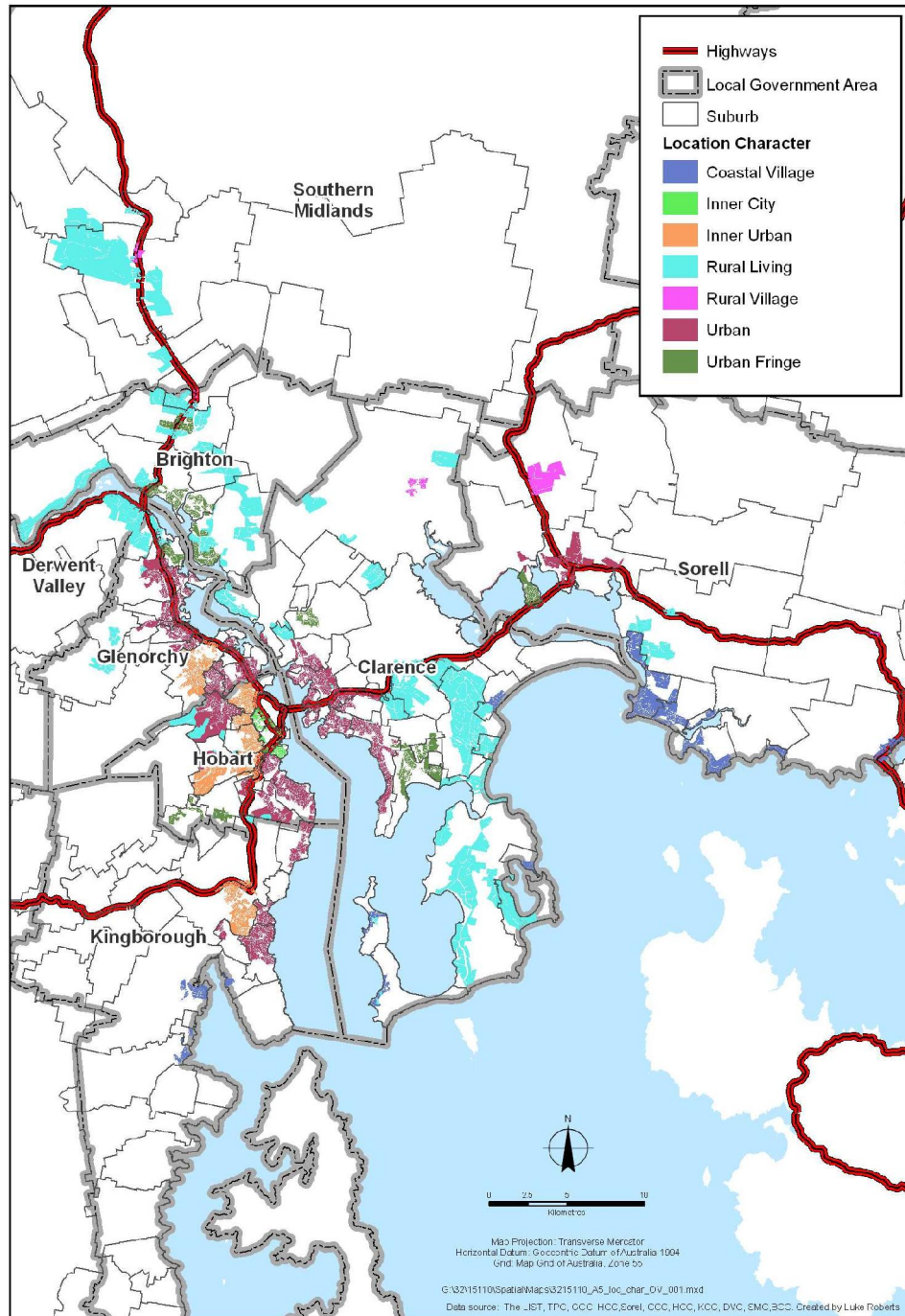


Table 3 Market Segments and Location Type

Market Segment	Location type	Existing Dwellings	Potential Dwellings
Lower			
	Coastal Village	858	830
	Rural Living	187	350
	Urban	766	566
	Urban Fringe	5285	4745
Lower Total		7096	6491
Middle lower			
	Coastal Village	2195	1425
	Inner Urban	8371	3615
	Rural Living	2473	2510
	Rural Village	192	480
	Urban	14925	6455
	Urban Fringe	3651	6017
Middle lower Total		31807	20502
Middle top			
	Coastal Village	2208	1266
	Inner City	1256	1
	Inner Urban	5191	137
	Rural Living	3168	260
	Rural Village	409	52
	Urban	16952	4063
	Urban Fringe	600	388
Middle top Total		29784	6167
Top			

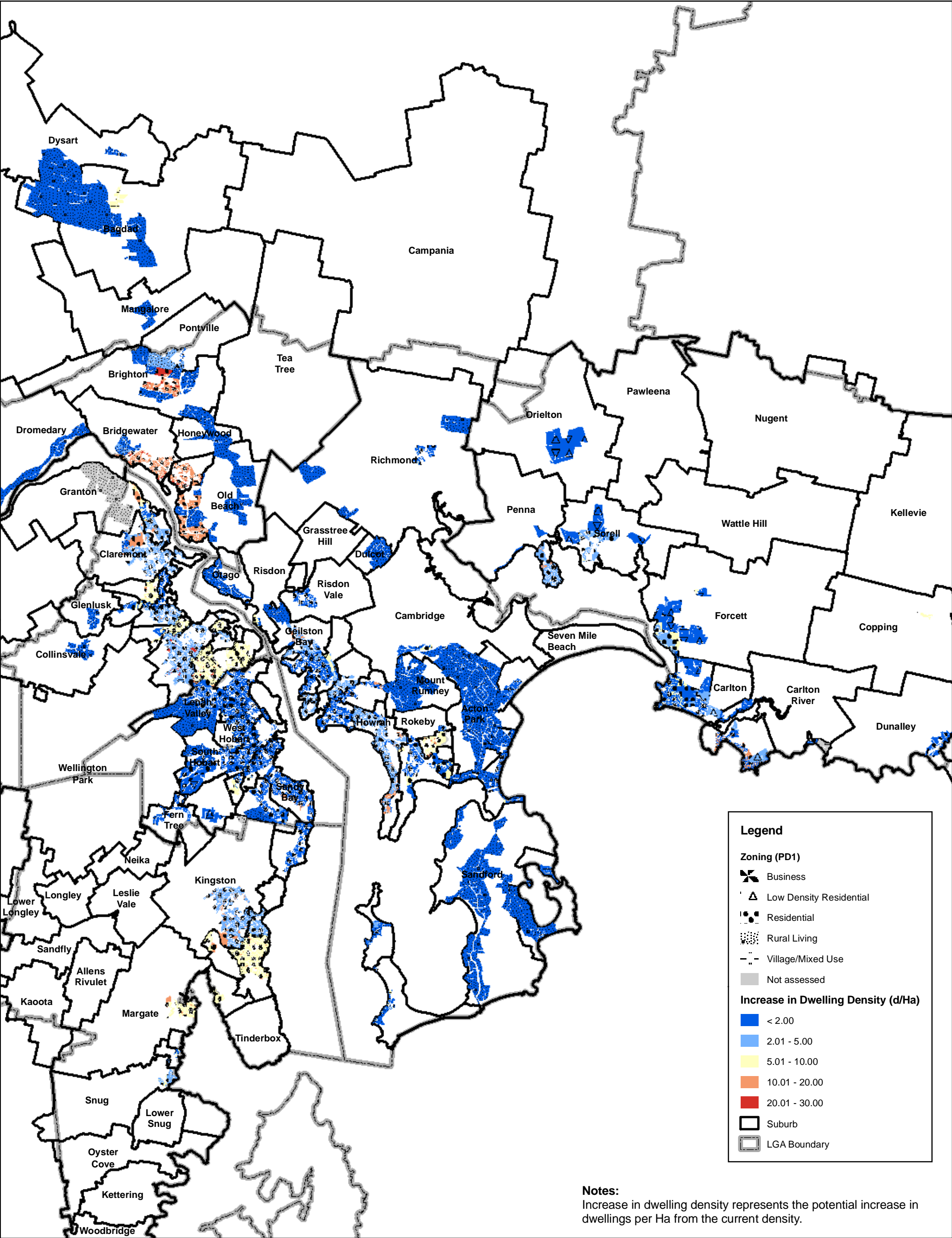
Market Segment	Location type	Existing Dwellings	Potential Dwellings
	Inner City	2489	10
	Inner Urban	4334	145
	Rural Living	18	0
	Urban	7468	1304
Top Total		14309	1459
Grand Total		82996	34619

4.2 Sample results overview:

The assessment sampled approximately 5% of parcels within the Greater Hobart region, representing an area of approximately 1700 ha, or 9% of the total land area (1800 ha). Table 4 shows the potential density through subdivision against the existing density with Figure 6 showing the increase in density, the following trends are noted:

- ▶ When the sample results returned a lower potential density than the existing density (as evident in Hobart City Council), the existing dwelling density has been applied. This is likely to be a result of changes to planning law, a conservative application of the planning schemes or a bias in the random sample used in this assessment.
- ▶ Small increases in potential density, (as shown in Kingston where the density increases from 8.35 dwellings/ha to 11.85 dwellings/ha) results in a significant increase in the number of potential dwellings. Either through a higher utilisation of existing developed land or the utilisation of vacant land.

Figure 6 Increase in dwelling density by suburb and zone (see over page)



Legend

Zoning (PD1)

Business

Low Density Residential

Residential

Rural Living

Village/Mixed Use

Not assessed

Increase in Dwelling Density (d/Ha)

< 2.00

2.01 - 5.00

5.01 - 10.00

10.01 - 20.00

20.01 - 30.00

Suburb

LGA Boundary

Notes:
Increase in dwelling density represents the potential increase in dwellings per Ha from the current density.



Table 4 Sample Densities and existing density

LGA	PD1 Zone	Potential Density (sub division only)	Sample Area (ha)	Existing Density	Total Area (ha)	Vacant Area (ha)
Brighton						
	Residential	22.36	21.38	9.67	525.51	109.68
	Rural Living	1.96	83.98	0.73	1764.42	309.54
Clarence						
	Low Density Residential	3.42	6.23	3.66	141.60	45.45
	Residential	13.75	86.89	12.06	1534.06	156.23
	Rural Living	0.44	461.54	0.95	4508.42	434.04
	Village/Mixed Use	7.48	10.80	8.39	181.22	18.13
GCC						
	Low Density Residential	3.96	3.93	5.13	66.63	15.19
	Residential	19.85	89.28	12.85	1456.92	133.10
	Rural Living	0.42	28.21	0.92	337.29	65.20
HCC						
	Business	5.88	1.74	42.86	10.25	0.87
	Low Density Residential	1.62	14.45	1.55	219.85	41.12
	Residential	7.67	171.00	16.57	1643.38	211.81
	Rural Living	0.02	204.52	0.55	623.02	97.20
	Village/Mixed Use	5.18	3.15	28.08	36.06	0.66
KCC						
	Residential	11.86	63.46	8.35	1058.30	115.74
Sorell						



LGA	PD1 Zone	Potential Density (sub division only)	Sample Area (ha)	Existing Density	Total Area (ha)	Vacant Area (ha)
Southern Midlands Council	Low Density Residential	1.16	102.77	0.83	1275.03	320.59
	Residential	6.95	39.52	5.45	962.46	168.12
	Village/Mixed Use	11.45	1.22	3.14	11.09	
	Rural Living	0.21	323.41	0.34	2022.80	279.83
	Village/Mixed Use	11.80	2.03	2.65	46.91	1.31

5. Key Findings and Recommendations

Previous studies calculated the potential dwelling yields, through the application of gross calculations based on the total zoned area and a density of 10 dwellings/ha or through a targeted sampling process. This assessment utilised a randomised sample to estimate a theoretical potential for infill and development of vacant land in the context of the suburb and PD1 zoning, while removing land unlikely to be developed.

The results give a clear picture of the potential development under the existing planning scheme conditions with the potential increase of up to 34,000 dwellings across the region, based on sampling 5% of parcels or 9% of the land area. Figure 6 outlines the changes in potential dwelling density with the largest potential growth evident in Brighton and the smallest in Hobart. Of significance is that the greatest potential growth is in the middle lower market segment as shown in Table 3 with the urban and urban fringe showing the greatest potential for growth with the inner city areas of Hobart showing little potential for additional growth.

We recommend that further work be completed to understand the following factors which will impact on the potential growth being realised including:

- ▶ New or altered planning schemes,
- ▶ Subdivision and take up patterns,
- ▶ The character and demographics of the suburbs and zones (housing age, number of occupants, number of bedrooms)
- ▶ Access to services,
- ▶ Demographic trends,
- ▶ Further testing of the infill potential to understand the statistical variation in sample,
- ▶ The potential for multiple dwellings (data has been collected),
- ▶ Impact of releasing government land for affordable housing, or
- ▶ Likelihood of the identified infill potential being realised across large numbers of privately owned parcels.



6. References

Australian Properties Monitoring, sighted September 2009,
http://www.homepriceguide.com.au/snapshot/index.cfm?source=domain&domain_ads=: Results
by LGA

Connell Wagner: Clarence Residential Strategy, April 2008

Hobart City Council: Report on Residential Development Potential, Population and Dwellings, March
2006

Hogue, S., Department of Environment and Land Management, Future Urban Development and
Infrastructure Provision in Greater Hobart. March 1996.

Glenorchy City Council: Residential Land Supply & Demand, Planning Scheme Review – Topic Papers
(Draft), April 2008.



Appendix A

LGA, Suburb, Zoning, location
characteristic, market segments and
potential number of additional dwellings
(see spread sheet)



Appendix B

Guidelines for assessment



Southern Tasmania Regional Planning Project
Dwelling Yield Analysis
Guidelines for Provision of Local Government Input
14 December 2009

The intention of these guidelines is to ensure a consistent approach from the various councils in the completion of the dwelling yield analysis tables provided from consulting firm GHD.

Assumptions:

1. All lots are considered 'vacant' irrespective of whether they have an existing dwelling or not. Accordingly, the task does not require any assumptions for developed land regarding the percentage of lot that is required to be retained for any existing dwelling.
2. A lot is to be considered constrained from any further development if it is within one or more of the Constraining Planning Scheme Overlays, as defined below. All such lots are to be considered as having no subdivision potential and no multiple residential potential.

Process:

1. Consultants GHD have provided a spreadsheet for each Council area with a random selection of 5% of parcels. Note: the actual area of each parcel has now been provided.
2. Utilising your GIS, review the parcels, identify parcels which are constrained by the planning scheme overlays (outlined in constraining layers section).
3. Calculate a theoretical maximum lot yield based on the minimum lot size and the actual size of the parcel. The number of lots is to be a "total lots including the parent title" rather than "additional lots".
4. Calculate a theoretical maximum dwelling yield based on the relevant dwelling unit factor (or equivalent under the particular scheme). Note: in zones where multiple dwellings are prohibited, the theoretical maximum dwelling yield will equate to the theoretical maximum lot yield – i.e. one dwelling per lot.)
 - a. The existing number of dwellings is the minimum number of dwellings on the lot.

Constraining Layers

A planning scheme layer / overlay equivalent to one of the following:

- 1 in 100 year flood level,
- threatened veg communities,
- threatened species,
- coastal inundation (being land under 3m AHD)
- any other overlay of an individual planning scheme that prohibits subdivision or multiple dwelling development

Other Constraints:

Heritage listing of the property (but not properties with a heritage areas/precinct that are not individually listed): If a property is individually listed it is to be considered totally 'constrained'.

Limited road frontage: If a property has limited frontage, for example a 'battle axe' block, a judgment will have to be made by the assessor as to whether this constrains any further subdivision or any further unit development.

Other Comments:

Slope will be assessed through the GIS as a separate exercise.

All properties currently listed as a strata have been removed from assessment, remaining multi unit developments have been left.

Duplicate parcels (textual PID, lot/Dp or spatial position) are to be marked as duplicate in the spreadsheet.



Appendix C

Market Segments



Location characteristics and Market segments

Location characteristics (Figure 5) and market segments (Figure 4) have been adapted from previous studies and agreed on with the Joint Project Managers, the characteristics will be attributed to the suburbs layer for inclusion as part of the tabulated results. The location character is described in Table 4 describing the different types of locations from inner city location through to coastal villages and rural living areas, complementing this are the market segments which classify the suburbs according to the median sale price in each suburb.

Table 5 Location Characteristics

Location description	Character	Examples suburbs
Inner city	Area surrounding Hobart CBD	Battery Point North Hobart Glebe
Inner Urban	Area surrounding secondary commercial/ service centres Close to Hobart CBD	Glenorchy Kingston Rosny West Hobart
Urban	Suburban areas Good access to services	Moonah Howrah Sorell Blackmans Bay
Urban Fringe	Edge of urban growth New growth suburbs Limited services	Clarendon Vale Bridgewater Midway Point
Coastal village	Standalone village Commercial activity	Primrose Sands Snug
Rural village	Stand alone village	Pontville Richmond
Rural Living	Land zoned as rural living	Acton Park Bagdad (Surrounds) Granton Orielton

Market segments are a classification of suburbs into top, top middle, lower middle and lower, based on



the relative position of the median sale price in the suburb to the suburbs in the study area. The median price for each suburb, has been sourced from the publicly available information on the Australian Property Monitors (Sep 2009), in its “Suburb snapshot” giving:

- Median price (6 months to September 2009)
- Regional Median price (6 months to September 2009)

The suburb median price primarily used, unless the results over the last 6 months is not statistically significant, in which case the regional median price is used. Each suburb is classified utilising the Quartile performance method giving the following classes in Table 5:

Table 5 Market Segment Price Range

Market Segment	Quartile performance	Minimum Price (Sept 2009)	Maximum Price (Sept 2009)
Top	Top 25% of results	400000	635000
Middle top	Middle 50-75% of results	305000	391000
Middle lower	Middle 25-50% of results	240000	300000
Lower	Bottom 25% of results	155000	205000
No data available		NA	NA

Figure 5 the results presents the spatial classification of the market segments, while Figure 4 in the results shows the location characteristics of the study area. A full list of the suburbs with associated location characteristic and market segment information is presented below in Table 6.



Table 6 Market segment classification

Suburb Name	Postcode	Median sale value (sept 2009)	Market Segment
Acton Park	7170	330000	Middle top
Allens Rivulet	7150	350000	Middle top
Austins Ferry	7011	290000	Middle lower
Bagdad	7030	255000	Middle lower
Barretta	7054	345000	Middle top
Battery Point	7004	635000	Top
Bellerive	7018	367000	Middle top
Berriedale	7011	251000	Middle lower
Birchs Bay	7162	0	No data available
Blackmans Bay	7052	375000	Middle top
Bonnet Hill	7053	350000	Middle top
Boomer Bay	7177	243000	Middle lower
Bream Creek	7175	0	No data available
Bridgewater	7030	195000	Lower
Brighton	7030	265000	Middle lower
Cambridge	7170	330000	Middle top
Campania	7026	243000	Middle lower
Carlton	7173	270000	Middle lower
Carlton River	7173	270000	Middle lower
Chigwell	7011	205000	Lower
Claremont	7011	241000	Middle lower
Clarendon Vale	7019	155000	Lower



Suburb Name	Postcode	Median sale value (sept 2009)	Market Segment
Clifton Beach	7020	330000	Middle top
Collinsvale	7012	263000	Middle lower
Coningham	7054	350000	Middle top
Connellys Marsh	7173	270000	Middle lower
Copping	7174	243000	Middle lower
Cremorne	7024	330000	Middle top
Derwent Park	7009	263000	Middle lower
Dodges Ferry	7173	270000	Middle lower
Dowsing Point	7010	263000	Middle lower
Dromedary	7030	255000	Middle lower
Dulcot	7025	330000	Middle top
Dunalley	7177	243000	Middle lower
Dynnyrne	7005	431000	Top
Dysart	7030	255000	Middle lower
Electrona	7054	350000	Middle top
Fern Tree	7054	350000	Middle top
Flowerpot	7163	0	No data available
Forcett	7173	270000	Middle lower
Gagebrook	7030	160000	Lower
Garden Island Creek	7112	243000	Middle lower
Geilston Bay	7015	320000	Middle top
Glebe	7000	431000	Top
Glenlusk	7012	263000	Middle lower
Glenorchy	7010	260000	Middle lower
Goodwood	7010	263000	Middle lower



Suburb Name	Postcode	Median sale value (sept 2009)	Market Segment
Gordon	7150	350000	Middle top
Granton	7030	255000	Middle lower
Grasstree Hill	7017	255000	Middle lower
Hobart	7000	431000	Top
Honeywood	7017	195000	Lower
Howden	7054	350000	Middle top
Howrah	7018	345000	Middle top
Huntingfield	7055	350000	Middle top
Kaoota	7150	350000	Middle top
Kellevie	7176	243000	Middle lower
Kettering	7155	243000	Middle lower
Kingston	7050	295000	Middle lower
Kingston Beach	7050	400000	Top
Lauderdale	7021	349000	Middle top
Lenah Valley	7008	358000	Middle top
Leslie Vale	7054	0	No data available
Lewisham	7173	270000	Middle lower
Lindisfarne	7015	365000	Middle top
Longley	7150	0	No data available
Lower Longley	7109	243000	Middle lower
Lower Snug	7054	350000	Middle top
Lutana	7009	282000	Middle lower
Magra	7140	198000	Lower
Mangalore	7030	255000	Middle lower
Margate	7054	305000	Middle top



Suburb Name	Postcode	Median sale value (sept 2009)	Market Segment
Marion Bay	7175	243000	Middle lower
Middleton	7163	243000	Middle lower
Midway Point	7171	280000	Middle lower
Montagu Bay	7018	330000	Middle top
Montrose	7010	245000	Middle lower
Moonah	7009	263000	Middle lower
Mornington	7018	262000	Middle lower
Mount Nelson	7007	408000	Top
Mount Rumney	7170	330000	Middle top
Mount Stuart	7000	431000	Top
Neika	7054	0	No data available
New Town	7008	375000	Middle top
North Hobart	7000	365000	Middle top
Nugent	7172	0	No data available
Oakdowns	7019	330000	Middle top
Old Beach	7017	300000	Middle lower
Opossum Bay	7023	330000	Middle top
Orielton	7172	330000	Middle top
Otago	7017	255000	Middle lower
Oyster Cove	7150	350000	Middle top
Pawleena	7172	270000	Middle lower
Penna	7171	270000	Middle lower
Pontville	7030	255000	Middle lower
Primrose Sands	7173	182000	Lower
Queens Domain	7000	0	No data available



Suburb Name	Postcode	Median sale value (sept 2009)	Market Segment
Richmond	7025	330000	Middle top
Ridgeway	7054	350000	Middle top
Risdon	7017	255000	Middle lower
Risdon Vale	7016	186000	Lower
Roches Beach	7170	330000	Middle top
Rokeby	7019	203000	Lower
Rose Bay	7015	330000	Middle top
Rosetta	7010	286000	Middle lower
Rosny	7018	330000	Middle top
Rosny Park	7018	330000	Middle top
Sandfly	7150	350000	Middle top
Sandford	7020	330000	Middle top
Sandy Bay	7005	560000	Top
Seven Mile Beach	7170	330000	Middle top
Snug	7054	350000	Middle top
Sorell	7172	290000	Middle lower
South Arm	7022	330000	Middle top
South Hobart	7004	369000	Middle top
Taroona	7053	391000	Middle top
Tea Tree	7017	255000	Middle lower
Tinderbox	7054	350000	Middle top
Tolmans Hill	7007	431000	Top
Tranmere	7018	425000	Top
Warrane	7018	240000	Middle lower
Wattle Hill	7172	0	No data available



Suburb Name	Postcode	Median sale value (sept 2009)	Market Segment
Wellington Park	7054	0	No data available
West Hobart	7000	411000	Top
West Moonah	7009	266000	Middle lower
Woodbridge	7162	243000	Middle lower



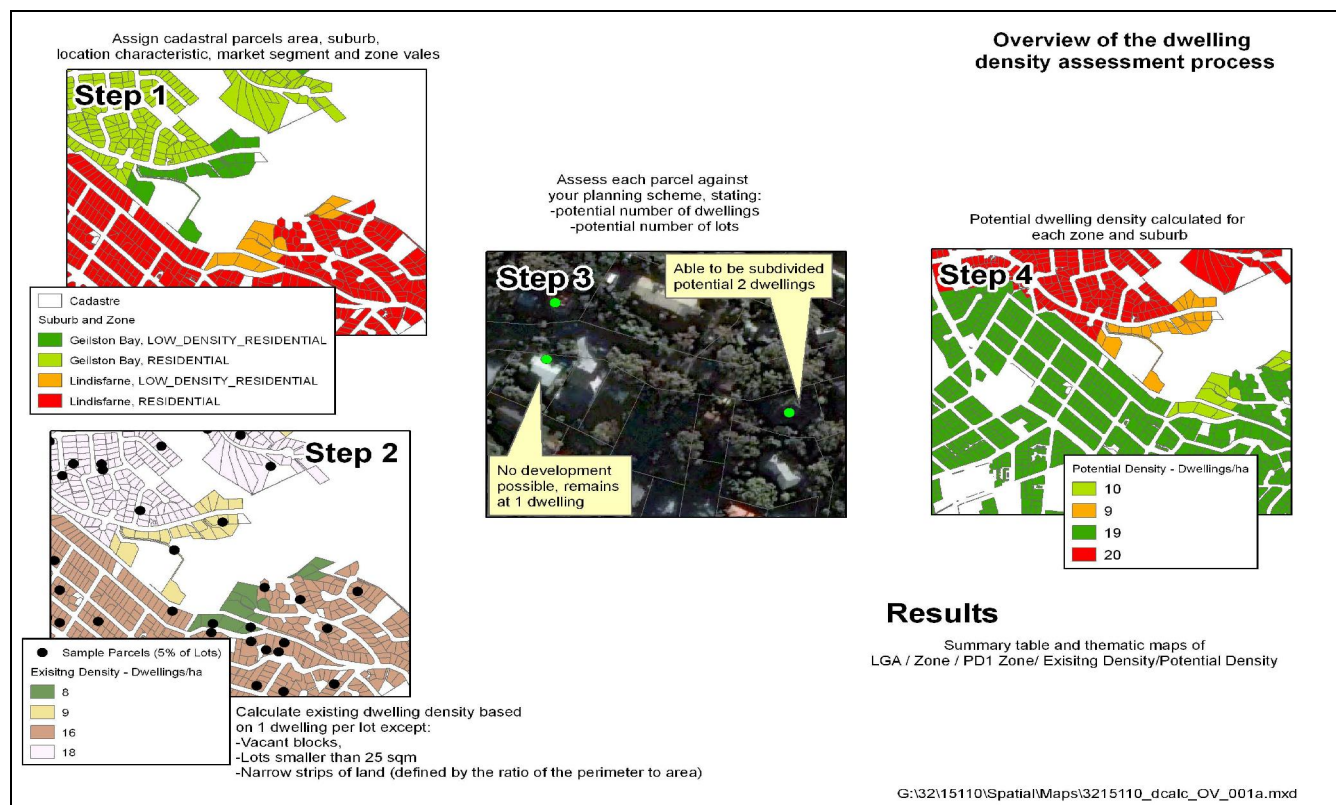
Appendix D

Methodology

The sampling process includes a randomised sample of all parcels across the residential land based on the study area outlined above. By randomising the sample, an independent selection of parcels will be created. This may over select parcels which can not be developed further or under select parcels which can not be developed further

The assessment process is demonstrated below in Figure 2 involves the compilation of land parcels into location and PD1 zone (step 1) then randomly selecting 5 % of parcels by randomly placing points over the parcels to the value of 5% of the total parcels available (step 2). Step 3 is completed by the planning offices for each council, applying the scheme as directed in the guidelines (Appendices B), step 4

Figure 7 : Assessment Process



Step 1

- Merge Council Zone, PD1,LGA, suburb, market segments and locational characteristics into cadastral, remove all parcel types not being considered.
- Calculate areas of each parcel
- Assign values for number of dwellings (outlined in above in section 1.1):



- Vacant parcels, Rvalue and parcels smaller than 24sqm given a dwelling value of zero
- All other parcels given a value of 1

Step 2

- Summarise cadastre by LGA, Council zone, PD1 zone, Suburb, area, Count of parcels, count of dwellings
- Randomly select 5 % of parcels in each suburb.

Step 3

Council's assess parcels as per directions in Appendix B.

Step 4

Based on results of **Error! Reference source not found.** potential dwelling density and yield calculations with summary tables and maps produced, section **Error! Reference source not found.** gives the detailed method and worked example for the calculation of the density and potential lots/dwellings.

Calculation of density

Where:

V = Parcels with Existing dwellings that cannot be further developed (V1pot)
= Parcels currently vacant that cannot be developed (V2pot)
= Existing vacant land (Vexisitng) – Always 0 (no dwellings currently on this)

D = Parcels with existing dwellings that can be further developed (Dpot)
= Parcels currently underdeveloped that can be developed (Dpot)
= Exisitng developed land (Dnow) – Dwellings currently exist on this

Total area (existing) = Area of Vexsting + Dexisting parcels

Total Area (Sample) = Area of Vsample + Dsample parcels

A ~ Existing yield (100% of parcels) = Dnow/Total area exsiting

Eg: Sorell / Carlton/ Residential



403 dwellings/101 ha = 3.9 d/ha

B ~ Potential Yield (5% of parcels) = $D_{pot}/D_{sample} + V_{pot}/V_{sample} = \text{Total pot}/\text{Total area sample}$

Scale up/multiply potential yield total area to match
existing yield total area (ie make equivalent)

eg: Potential yield (5% of parcels) = $41/5.89 + 8/0.59 = 49/6.48$

Ratio of sampled land to total area = $101/6.48 = 15.58$

\therefore Total potential lot yield: $49 \times 15.58 = 763$ Lots



GHD

2 Salamanca Square Hobart 7000
GPO Box 667 Hobart 7001
T: 03 6210 0600 F: 03 6210 0601 E: hbamail@ghd.com.au

© GHD 2010

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	Luke Roberts	A Johnson J Puustinen	DRAFT	A Johnson	DRAFT	18/12/09
2	Luke Roberts	Cam Watts	Draft	A johnson	Draft	19/12/2009
3	Luke Roberts	Cam Watts	Draft	F Read	Draft	12/2/2010
4	Luke Roberts	A Johnson	Final Draft	A Johnson	Final	09/03/10