



D9

VOLUME D: AIRSPACE

Social Impact Assessment

CONTENTS

9.1	Introduction	359
9.2	Methodology	359
9.2.1	Approach	359
9.2.2	Significance Criteria	361
9.3	Limitations and Assumptions	361
9.4	Baseline - Summary Description of the Social Environment	363
9.4.1	Introduction	363
9.4.2	Communities Within the Airport Study Area	364
9.4.3	Consideration of Suburb Level Social Impacts	364
9.5	Public Engagement	372
9.6	Relevant Statutory and Policy Requirements	374
9.7	Assessment	374
9.7.1	Background	374
9.7.2	Potential Impact of Aircraft Operations at and from the NPR	375
9.8	Cumulative and Interactive Effects	388
9.9	Assessment Summary Matrix	388

FIGURES AND TABLES**Figures**

Figure 9.4a:	Health, Aged and Disabled Facilities
Figure 9.4b:	Child Care Centres
Figure 9.4c:	Places of Worship
Figure 9.4d:	Educational Facilities
Figure 9.4e:	Recreation Facilities
Figure 9.4f:	Centres Hierarchy: Community Nodes
Figure 9.7a:	Distribution of Population 0-14, 2001
Figure 9.7b:	Distribution of Population 75+, 2001
Figure 9.7c:	Distribution of Population 75+, 2011
Figure 9.7d:	Distribution of Unemployed, 2001
Figure 9.7e:	Distribution of Housing Authority Dwellings, 2001
Figure 9.7f:	Distribution of Single Parent Families, 2001
Figure 9.7g:	Resided at Same Address 5 Years Ago
Figure 9.7h:	Distribution of Shift Workers
Figure 9.7i:	Non-Private Dwellings

Tables

Table 9.1:	Guideline Requirements for Social Impact Assessment
Table 9.2:	Significance Criteria for Social Impact Assessment
Table 9.4:	Vulnerable, Susceptible or Sensitive Groups by Noise Effect
Table 9.5:	Community Survey Results
Table 9.7a:	Estimated Change in the Number of Community Facilities Exposed to 70 dBA Overflights Resulting from Opening NPR in 2015
Table 9.7b:	Noise Effects on Schools in 2015 for Summer Weekday Day
Table 9.9:	SIA Assessment Summary Matrix

APPENDICES

Appendix A:	Information Supporting the SIA (Chapter D9)
--------------------	---

SUMMARY OF KEY FINDINGS

- 50 suburbs will experience some change in the number of flights over them when the New Parallel Runway (NPR) becomes operational;
- For the majority of these 50 suburbs (approximately 70 percent), the change will be less than 10 flights over them during the day (between the hours of 6am–6pm), 5 flights in the evening (6pm–10pm) and 2 overflights at night (10pm–6am);
- The following suburbs will have a notable reduction in overflights during the daytime (6am–6pm):
 - Cannon Hill, Eagle Farm, Morningside, Murrarie, Pinkenba and Seven Hills;
- The following suburbs will have a notable increase of overflights during the daytime (6am–6pm):
 - Ascot, Balmoral, Bulimba, Hamilton, Hawthorne and Hendra;
- Broadly similar suburban results are experienced during the evening period (6pm–10pm) when the NPR becomes operational;
- There are significant benefits to the following suburbs during the night time (10pm–6am) due to a notable reduction in overflights when the NPR becomes operational:
 - Cannon Hill, Eagle Farm, Hemmant, Morningside, Murrarie, Norman Park, Pinkenba and Seven Hills;
- **No** suburbs will experience a notable increase in overflights during the night time (10pm–6am);
- Educational facilities that would experience a notable increase in overflights are:
 - Morningside Primary and Preschool, Lourdes Hill College Hawthorne, Balmoral High, St Peter's and St Paul's Catholic Primary School Balmoral, Bulimba Primary, Hamilton Primary and TAFE Brisbane North Institute Gateway Campus Eagle Farm;
- Educational facilities that would experience a notable decrease in overflights are:
 - Pinkenba Primary, Cannon Hill Anglican College, Murrarie Primary and Preschool, Cannon Hill Primary, Seven Hills Primary and TAFE South Bank Institute Morningside Campus Seven Hills.

9.1 Introduction

The purpose of this Chapter is to consider the community impact issues arising from the New Parallel Runway (NPR) project related to aircraft operations at and from the NPR. Opening of the NPR would be accompanied by changes to the airspace design around Brisbane Airport, with consequent changes to noise exposure. The purpose of this report is to consider those impacts related to aircraft operations at and from the NPR.

Social impacts related to construction and operational issues on the Airport and its surrounds are provided in Chapter B9. Social impacts from operations at Middle Banks are separately considered in Chapter C7. **Table 9.1** provides more detail as to the requirements of the Environmental Impact Statement (EIS) Guidelines for the consideration of social issues and impacts and where matters can be found in the Draft Environmental Impact Statement and Major Development Plan (EIS/MDP).

9.2 Methodology

9.2.1 Approach

There are many definitions of social impacts. Two definitions suitable to the present assessment are:

Significant events experienced by people as changes in one or all of the following:

- Peoples way of life - how they live, work, play and interact with one another on a day to day basis;
- Their culture - shared beliefs, customs and values;
- Their community - its cohesion, stability, character, services and facilities.¹; and

- By social impacts we mean the consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalise their cognition of themselves and their society.²

Social Impact Assessment (SIA) is the analysis of social changes and impacts on community that are likely to occur as a result of a particular development, planning scheme or government policy decision.

The SIA has involved the following methodology:

- 1. Scoping.** Identify potentially affected groups and individuals and their issues of concern and the nature of the likely impact - what might happen where and to whom?
- 2. Profiling.** Describe the nature of the groups and individuals likely to be affected.
- 3. Prediction.** What are the social impacts associated with the development, who is affected and to what extent?
- 4. Assessment.** Are these impacts significant given the priorities, policies and programs of Government?
- 5. Management, mitigation, monitoring and review.** How can we best manage the potential impacts of this development which we have identified?
- 6. Recommendations.** What recommended strategies and actions will produce the best outcomes for the groups or individuals potentially impacted by the development?

¹ "Social Impact Assessment for Local Government: A Handbook for Councillors. Town Planners and Social Planners" (1995) NSW Office of Social Policy.

² "Principles and guidelines for social impact assessment in the USA" by The Interorganisational Committee on Principles and Guidelines for Social Impact Assessment, Impact Assessment and Project Appraisal, volume 21, number 3, September 2003.

Table 9.1: Guideline Requirements for Social Impact Assessment.

Guideline Requirements for Social Impact Assessment		Relevant Volume and Chapter in EIS/MDP		
	Airport and Surrounds	Middle Banks	Airspace	
1. A description of the key demographic characteristics of the South East Queensland region, including demographic trends.	Chapter B9 provides details of key demographic characteristics of the South East Queensland region with specific emphasis on those communities that immediately surround the airport site.	The demographic characteristics of adjacent settlements to the dredge site on Moreton Island are described in Chapter C7.	The description of key demographic characteristics and demographic trends of the South East Queensland region is described in Chapter B9 and not repeated in Volume D.	
2. Impacts of runway construction and airport operation on regional and local communities including noise, traffic, air quality, amenity, demands on local services and changes to lifestyle and everyday activities.	<p>The impact on communities surrounding the airport site as a result of:</p> <ul style="list-style-type: none"> Noise during construction and impacts arising from noise emissions due to increased traffic as a result of the NPR is to be found in Chapter B11; Air quality during construction and impacts arising from air emissions due to increased traffic as a result of the NPR is found in Chapter B12; Traffic during construction and increased traffic as a result of NPR during operation is to be found in Chapter B10; Visual amenity impacts of the NPR are to be found in Chapter B13; Other amenity issues and the impact on demands on local services is the focus of the impact assessment component of this chapter. 	<p>The impact on communities surrounding Middle Banks as a result of dredging operations are provided in summary in Chapter C7, as are the impacts on recreational and commercial fishing operations, recreational use of that part of Moreton Bay, tourism and access.</p> <p>In addition, amenity issues such as noise and air emissions from the dredging operations are considered in Chapter C9 the Dredge Management Plan. Visual amenity of the dredge operations are described in Chapter C8.</p>	<p>The impact of changes to airspace and flight paths for the NPR will be addressed in Volume D. Chapter D5 assesses the impact of overflight noise on communities surrounding the airport and in the South East Queensland region. Chapter D6 addresses the impacts of aircraft air emissions and Chapter D7 addresses the health impacts of the changes to airspace. Chapter D9 summarises and further assesses the social impacts arising from airspace and flight path arrangements associated with the NPR.</p>	
3. Impacts of airport operations on regional and local communities including impacts on demographic characteristics due to redevelopment or changes in land values.	Potential impacts on land values as a result of the NPR project are addressed in Chapter A2.			
4. Property acquisition requirements and processes.	No residential or commercial property is required to be resumed or acquired to construct the NPR project.	Not applicable.	Not applicable.	
5. Impacts on potential Native Title claimants.	This can be found in Chapter B2.	Not applicable.	Not applicable.	
6. Impacts on radio and television reception.	Not applicable.	Not applicable.	This issue is only relevant to airspace and can be found in Chapter D9.	

9.2.2 Significance Criteria

Socio-economic impacts do not have recognised 'standards', and as such it is not common practice to describe social impacts in terms of significance criteria. However, there is a need to assign a significance to this assessment so that any impacts can be considered in relation to the other environmental, engineering, social and economic impacts identified in association with the proposed development.

Table 9.2 defines significance criteria for assessing the environmental consequences of the proposed scheme upon:

- The character, amenity and liveability of affected areas as well as their cohesion, lifestyles and activities (community liveability and wellbeing);
- The demographic structure of regional and local communities;
- The amenity and utility of community and recreational facilities, as well as demand for their services;
- Access patterns and community mobility;
- Property and land uses (including businesses and tourism facilities); and
- Radio and television reception.

'Community liveability and wellbeing' is subjective and therefore difficult to define. Impacts on this concept differ according to the situation and socio-environmental factors. 'Amenity' plays a large part in the determination of community liveability and wellbeing. In this SIA, amenity is considered to be a term given to the attributes and appeal of a place. It is the 'liveability' or quality of a place which makes it pleasant and agreeable to be in, whether by the community as a whole or by an individual. Amenity is important in both the public and private domain, be it dwellings or publicly accessible land, workplaces, community facilities or open space. It can be affected by loss of privacy or views or by nuisance arising from the emission of noise, vibration, smell, fumes, smoke, dust or waste products.

9.3 Limitations and Assumptions

The following assumptions have been made in the study:

- The profile of the existing social environment is based primarily on 2001 data sourced from the Australian Bureau of Statistics (ABS) 2001 Census of Population and Housing. Projections have been made of this data where possible based on an assumption of the continuation of social trends. Brisbane's spatial and social structure will have substantially altered by 2015. Resident lifestyles will be influenced by these trends as well as technological developments and structural changes to the economy.
- Suburb level population projections utilised are those prepared by the Planning Information and Forecasting Unit (PIFU), Department of Local Government, Planning, Sport and Recreation for the Brisbane City Council. Assumptions made by PIFU are detailed in the 2005 document 'Brisbane Long Term Infrastructure Plan - Projection of Demographic Indicators: Final Report' and relate to:
 - The availability of greenfield land;
 - The location, size and timing of major development projects; and
 - The capacity for infill and redevelopment at ABS Collectors District (CD) level.

Table 9.2: Significance Criteria for Social Impact Assessment.

Significance	Criteria: Social Impact
Major Adverse	Irreversible and significant negative change to current amenity, lifestyle and community activities and functioning. Severance of many communities in the area from facilities, services or of a community itself. Permanent and total loss of formal and informal recreational facilities of regional importance, without opportunity for replacement/reprovisioning within the region. Loss or relocation out of the a community. Permanent closure of one or more businesses. Significant impact to many tourist attractions/facilities. Significant constraints on the ability for the airport to satisfy the needs of the Queensland economy.
High Adverse	Considerable adverse change to current amenity, lifestyle and everyday community activities with limited scope for mitigation. Displacement or relocation of houses or businesses. Separation of a number of communities or residential properties from facilities and services. Relocation of a community facility of regional value to a less socially appropriate location. Permanent and total loss of locally significant formal and informal recreational facilities without opportunity for replacement/reprovisioning. Impact to a large number of tourist attractions/facilities. Mitigation measures and detailed design work are unlikely to remove all of the significant effects upon the affected communities or interests.
Moderate Adverse	Noticeable adverse change to current amenity, lifestyle and everyday community activities, but with scope for some mitigation. Relocation of a community and or recreational facility to a less socially appropriate location. Separation of a small number of residences from facilities and services. Impact to a number of tourist attractions/facilities. Adverse impact upon a large number of businesses, however their operations remain viable. The disruption of radio and television reception for a community.
Minor Adverse	Localised or limited noticeable change to current amenity, lifestyle and everyday community activities, which can be largely mitigated. Some residual effects will still arise. The functional useability of community and recreational (formal or informal) facilities affected. Localised or limited change to the operation of businesses or tourism facilities. The disruption of radio and television reception for a substantial group of households.
Negligible	Very little change in the current situation. No appreciable impact on local amenity, resident lifestyle and everyday community activities. Imperceptible changes to the amenity of nearby residences. Temporary access alterations to residential properties, businesses, community facilities and recreational areas during construction. Temporary alteration to operation of businesses, community facilities and recreational areas during construction. The disruption of radio and television reception for a small number of households.
Moderate Beneficial	Noticeable improvements to current amenity, lifestyle and everyday community activities. Improved access to residential areas, businesses, community facilities and recreational areas. Improved access to public transport. Promotion of investment locally. Improved access to tourist attractions. Improvements to the operation of businesses or tourism facilities. The development of new social infrastructure which satisfies the needs of the local community.
High Beneficial	The creation of strong communities which are socially inclusive, with high levels of social capital, access to employment, secure housing and appropriate services and facilities. The development of new social infrastructure which satisfies the needs of the regional community. Significant promotion of the ability for the Airport to satisfy the needs of the Queensland economy.

9.4 Baseline - Summary Description of the Social Environment

9.4.1 Introduction

This section summarises the social environment of the communities which may be directly or indirectly impacted by the changes to the flight paths with the NPR. These investigations included the compilation of profiles of socio-economic information, social structure and conditions for these communities, as well as a description of their social infrastructure. The profiles examine their current composition, as well as (where possible) considering the likely composition of those communities at 2015 when the NPR commences operations. The profile is based upon data provided by the ABS Censuses of Population and Housing for 2001 and 1996. It has been supplemented with other data where available.

Social Environment Summary – South East Queensland

South East Queensland is Queensland's most populous region, home to approximately two-thirds of the State's population (2,374,606 people in 2001). The region is recognised as one of the fastest growing areas in Australia, with approximately 55,300 persons moving to the region each year between 1986 and 2004. In 2004, approximately 74.1 percent of the total population increase within South East Queensland was from net migration, whilst only 25.8 percent was from natural growth. A high proportion of this growth is occurring within the outer areas of Brisbane, but substantial population growth is occurring within Brisbane's inner areas closer to the NPR. This growth is expected to continue, with the population of South East Queensland projected to increase to approximately four million people by 2026. It is this growth, and the interlinked growth of the regions economy, which is driving the increasing demands for air transport, both passenger and freight, to which the project responds.

The area of interest for the SIA component of the project covers a 15 km radius around the airport. This essentially incorporates the majority of the Brisbane City Council Local Government Area (LGA), that is, 91 ABS Statistical Local Areas (SLAs) or suburbs, except for the outer west region, plus an additional three SLAs located within Redland Shire Council.

Appendix A describes the regional communities that may be affected by the impacts of a change in overflights and air emissions as a result of a change to airspace architecture. A radius of 15 km from the NPR was chosen as it includes all suburbs which could potentially be affected by overflight noise generated by the airport's operations. It also includes the core of the area benefiting most from the current economic effects of the airport. The Brisbane LGA and the South East Queensland Region have also been profiled, both as comparative measures, but also as the key communities whose economies and populations benefit from the airport and simultaneously drive the demand for increased airport capacity.

A summary matrix of the key indicators available for each suburb within the 15 km radius from the 2001 ABS Census is also included in Appendix A. The suburbs within the study are generally (with some exceptions), Brisbane's established suburbs, with a demographic structure which reflects this. In summary the resident population overall has the following characteristics:

- The total resident population is 568,577 in 2004. The Brisbane LGA is projected to have a population between 1,079,011 and 1,102,726 by 2026;
- A somewhat older age structure than South East Queensland, with 55.4 percent aged over 25 years (53.5 percent South East Queensland). 13.0 percent are aged over 65 years, compared to 12.3 percent in South East Queensland. There is relatively lower proportions of children aged 0-4 and 5-14 years than South East Queensland;
- A proportion of Indigenous residents similar to South East Queensland;

- Lower proportions of people from a non-English speaking background than South East Queensland;
- A lower rate of participation in the labour force than the Brisbane LGA (58.3 percent versus 63.7 percent);
- A higher level of educational attainment than South East Queensland; and
- A notably higher proportion of flats, units and apartments than South East Queensland (22.9 percent versus 12.7 percent). The dwelling occupancy rate was slightly lower than South East Queensland with 2.5 persons per household. The most common household type was the couple family with children (43.7 percent).

9.4.2 Communities Within the Airport Study Area

The study area is very large, including 95 suburbs which vary enormously in character - from denser inner city areas, to rural residential areas in the south-east, to coastal communities. An area this large will obviously contain a broad cross-section of the community.

Impacts from the NPR and its operations will not be evenly distributed within this 15 kilometre radius. Nor will impacts be evenly distributed within these individual communities. A review of research regarding the impact of aircraft noise (as summarised in Chapter D7), has identified that some groups within the community are more sensitive to its effects than others.

In order to assist the identification of social impacts and assess their significance for the community, it is important to develop a suite of key social indicators to inform the development of the profile of the existing social environment. It is through these indicators that the location of more 'vulnerable' communities and groups can be identified and an understanding of the likely extent of social impact can be gained.

9.4.3 Consideration of Suburb Level Social Impacts

An important consideration for the SIA is the identification of the amenity and lifestyles of the various communities within the study area, in order to enable the impact of the NPR upon these values to be assessed.

The primary community concern regarding the NPR is overflight noise. It is generally accepted that there are groups within the community who are more vulnerable to aircraft noise than the general population³. However, different groups are vulnerable to different effects (e.g. sleep disturbance, general annoyance, physiological effects) as identified in **Table 9.4**. Some of these more vulnerable groups are identified in the EIS Guidelines.

Accordingly, individual level data has been collected to supplement the community level data identified above and facilitate the assessment of a specific influence upon community liveability and wellbeing (namely noise).

In summary, those groups within communities considered to be more vulnerable to overflight noise generated by the Airport's operations are:

- People with particular health problems (physical or mental disorders);
- People with sleeping difficulties;
- People dealing with complex cognitive tasks;
- People with disabilities, such as the blind or the hearing impaired;
- Shift workers and people resting during daytime;
- Young children and school students;
- The elderly, as well as hospital and nursing home patients; and
- People with high anxiety and high stress levels.

Such groups are termed 'potential risk groups' in the SIA. The presence of some of these groupings can be represented spatially utilising available data.

³ World Health Organisation Regional Office for Europe: *European Centre for Environment and Health* (2001).

Table 9.4: Vulnerable, susceptible or sensitive groups by Noise Effect.

Effect	Susceptible or sensitive groups
Annoyance	Self-reported noise-sensitive individuals (IEH 97). Noise sensitive people, people with fear of certain sources, those feeling they have no control over the situation have an increased risk of severe annoyance (Netherlands 97). Those who indicate fear of aircraft crashes, those concerned with health effects of noise, those who report interference with activities, self-reported noise sensitive individuals (Morrel 97).
Sleep disturbance	Ill people, older people, people with sleeping difficulties (Netherlands 97). Elderly people, shift workers, those with physical or mental disorders, people with sleeping difficulties (Berglund 96). Shift workers (Job 96). Sensitive groups e.g. anxious/depressed (IEH 97). Children appear less susceptible to sleep disturbance caused by noise.
Speech disturbance	Elderly and hearing impaired.
Performance by school children	Pupils with learning difficulties, hearing impairment, English as a second language. (IEH 97).

Source: Department for Environment, Food & Rural Affairs Noise and Nuisance Policy - Health Effect Based Noise Assessment Methods: A Review and Feasibility Study (1998)

In addition, there is also an accepted relationship between the health of individuals and their socio-economic status. It is considered likely that those residents with a lower socio-economic status will be more susceptible to the effects of the NPR, such as aircraft noise. Lower socio-economic groups also have fewer resources (be they financial, educational, or social support networks) available to them with which to adapt to social impacts (for example, the ability to move home).

Literature further identifies that there is a range of social infrastructure which is more sensitive to noise. As identified in the EIS Guidelines, this includes:

- Health, aged and disabled facilities (identified in **Figure 9.4a**);
- Child care centres (identified in **Figure 9.4b**);
- Places of worship (identified in **Figure 9.4c**);
- Educational (identified in **Figure 9.4d**); and
- Recreation facilities (identified in **Figure 9.4e**).

In terms of the potential changes to lifestyle and everyday activities which could be generated by the NPR, it is important at the macro-level to understand how communities function spatially, that is, where the 'hubs' of community activity

and 'life' are located. Whilst this is discussed in Appendix A at the suburb level, **Figure 9.4f** spatially identifies these hubs (or centres) in terms of Council's City Plan 2000 Centres Hierarchy. This figure identifies Convenience, Suburban, and Major Centres, each of which has an increasingly larger residential catchment. These catchments assist an understanding of how suburbs relate to one another socially. For example, residents of Nudgee travel to Banyo at the convenience level and to Chermside or Nundah for higher order needs.

The above review of social indicators relevant to the SIA has identified that certain communities with a particular social structure will be more vulnerable to the type of impacts which will be generated by the NPR relative to others. That is, the impact from the NPR will be more significant upon certain suburbs than others. This knowledge is used to inform the development and application of significance criteria in section 9.2.

Figure 9.4a: Health, Aged and Disabled Facilities



**Summer Weekday Day
N70 5 overflight contour***

- 2015 with NPR
- 2015 Existing runway system

- Nursing Homes and Aged care
- Retirement villages
- Hospitals

* 70 dBA noise contour where there are at least 5 overflights.

Figure 9.4b: Child Care Centres

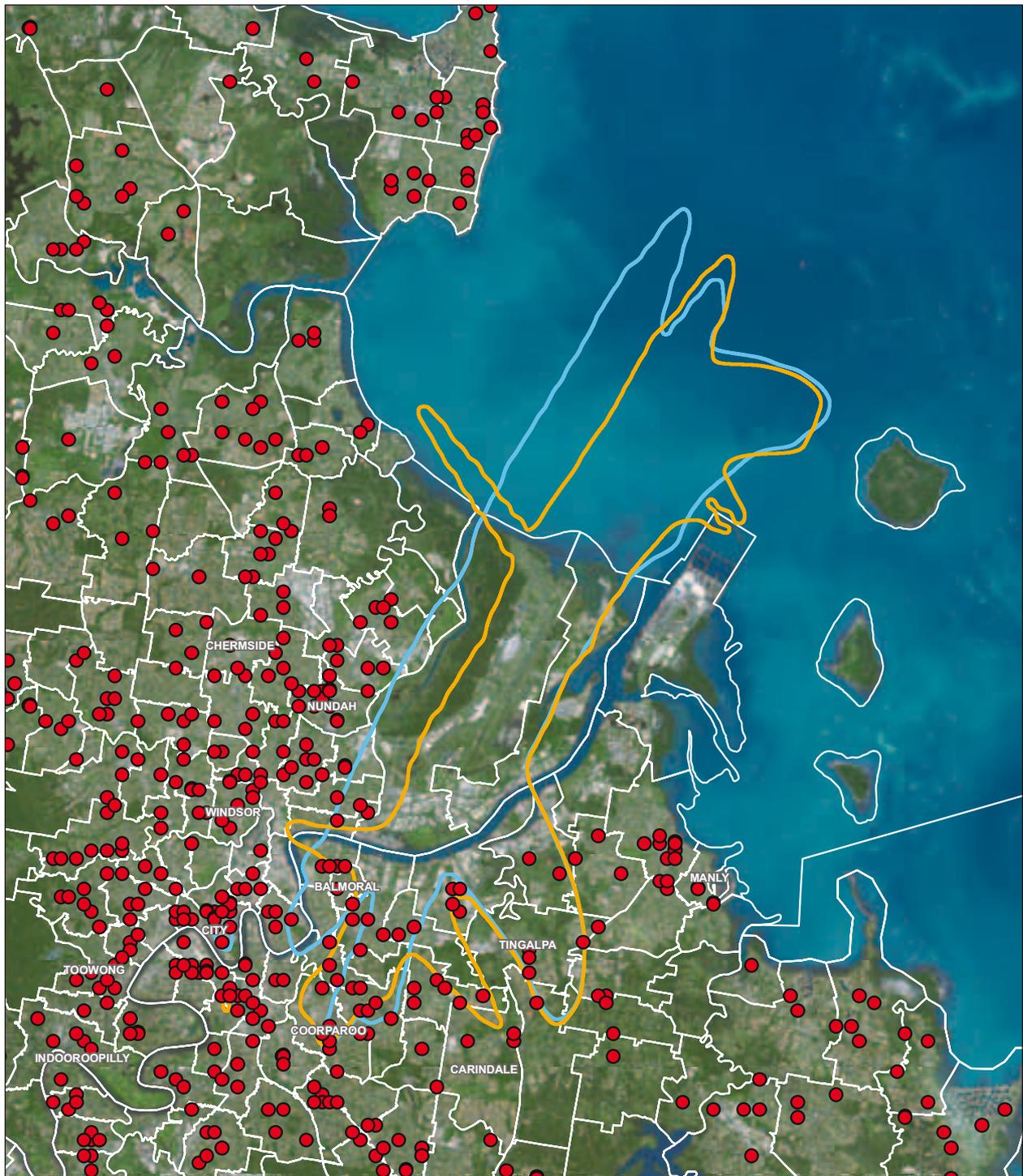


**Summer Weekday Day
N70 5 over flight contour***

- 2015 with NPR
- 2015 Existing runway system
- Child care centres and Kindergartens

* 70 dBA noise contour where there are at least 5 overflights.

Figure 9.4c: Places of Worship

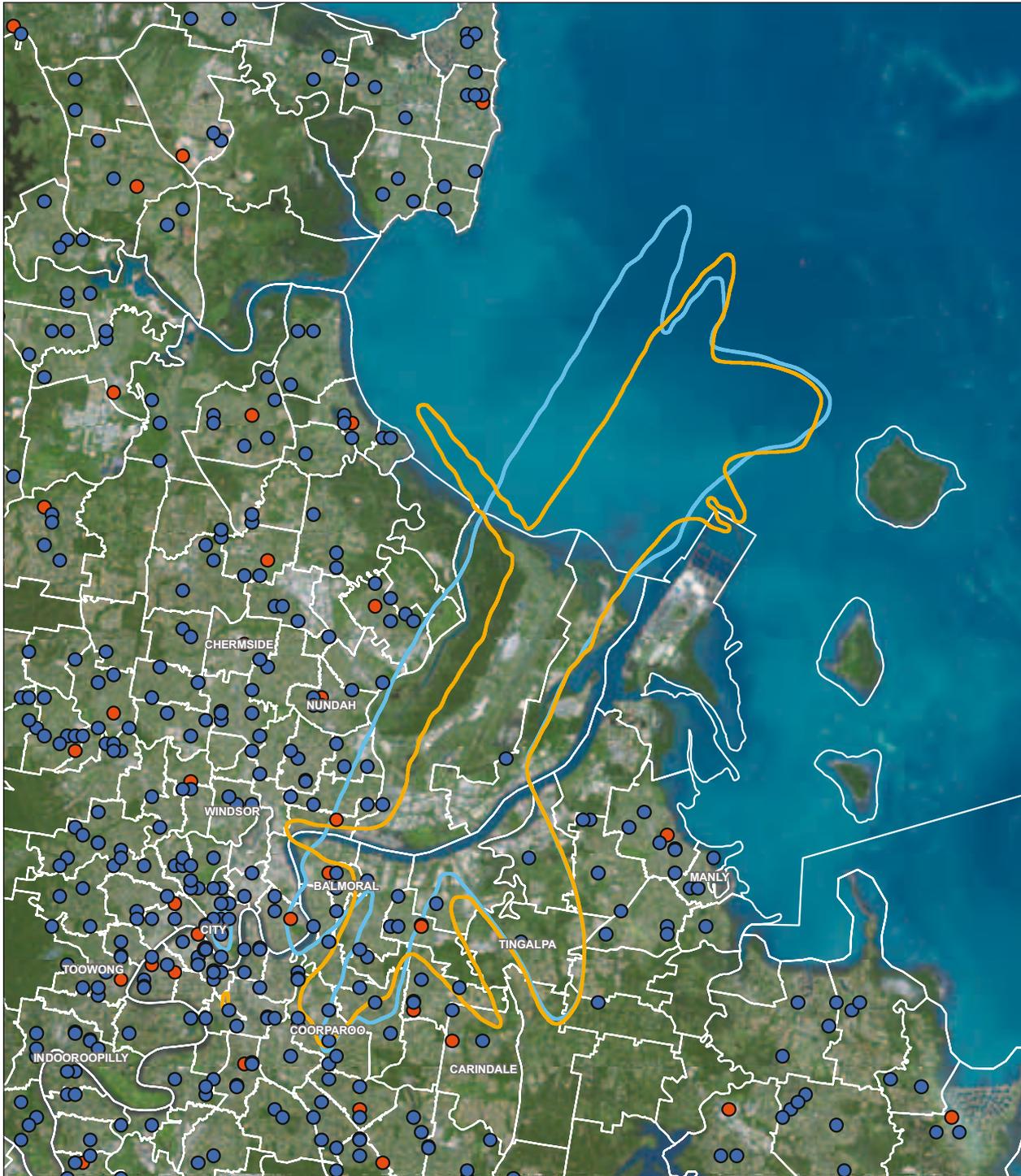


**Summer Weekday Day
N70 5 over flight contour***

- 2015 with NPR
- 2015 Existing runway system
- Places of Worship

* 70 dBA noise contour where there are at least 5 overflights.

Figure 9.4d: Educational Facilities



**Summer Weekday Day
N70 5 over flight contour***

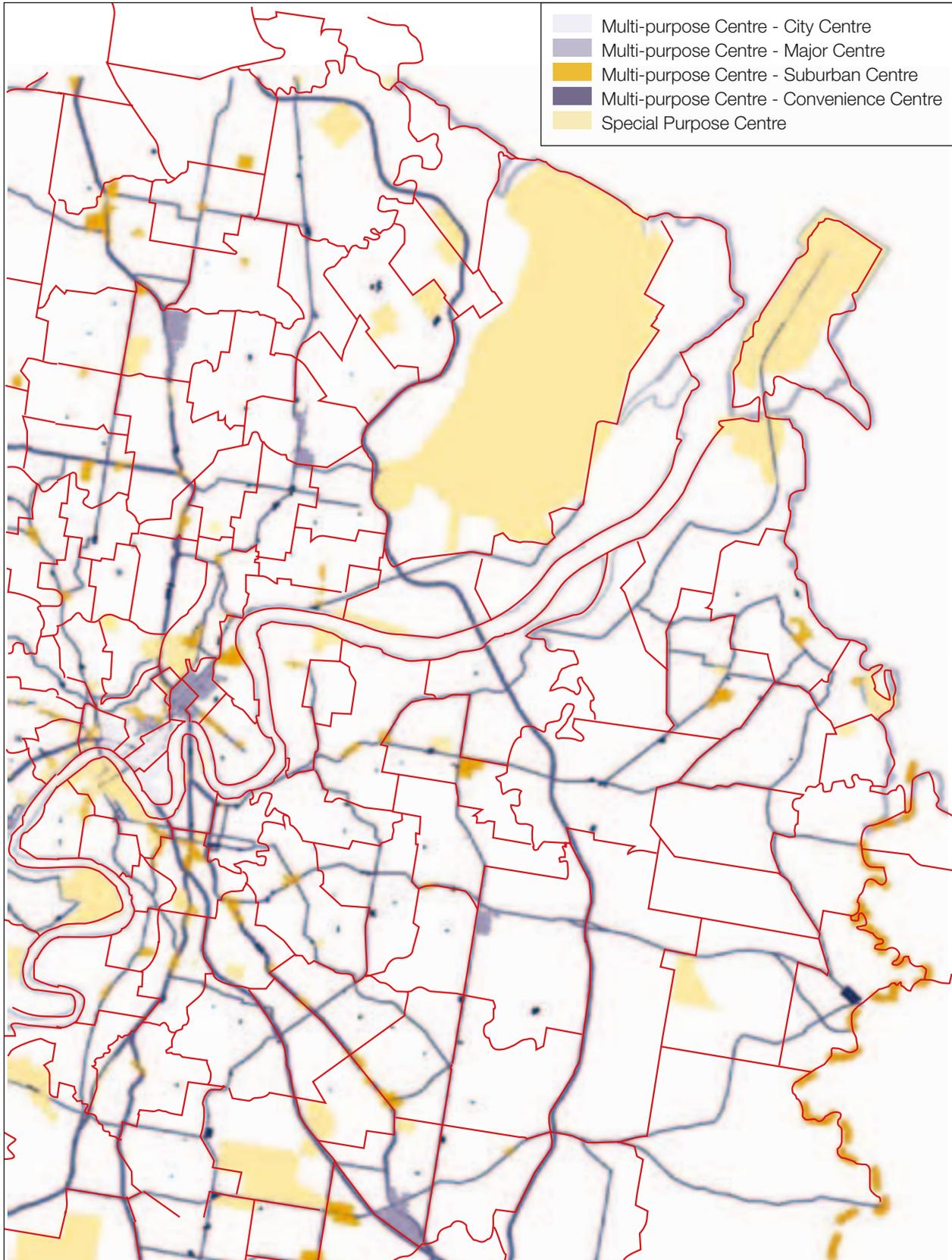
- 2015 with NPR
- 2015 Existing runway system
- Schools and Universities
- Libraries

* 70 dBA noise contour where there are at least 5 overflights.

Figure 9.4e: Recreation Facilities



Figure 9.4f: Centres Hierarchy: Community Nodes



Source: Brisbane City Council City Plan 2000

9.5 Public Engagement

As described in Chapter A6, a number of community engagement mechanisms were implemented during the preparation of the EIS.

Issues raised during this engagement are summarised broadly in **Table 9.5**, which reports the results of two surveys undertaken by the EIS. Suburbs with the greatest levels of concern regarding the NPR can be identified from the newsletter survey undertaken by the EIS. Five distinct geographical groupings of respondents can be discerned when the surveys' returns are spatially represented:

1. 32.6 percent of responses were from a 'southern sector' of Brisbane, which broadly correlates to the main flight path to the south of the airport today. This includes Holland Park, Tarragindi, Wellers Hill, Coorparoo, Camp Hill, Carina, Carina Heights, Carindale, Cannon Hill, Morningside, Norman Park, Seven Hills, Balmoral, Bulimba, Hawthorne and Tingalpa.
2. 7.5 percent were from the 'northern coastal' suburbs of Deception Bay. This includes Bracken Ridge, Brighton, Deagon, Sandgate, Shorncliffe, Clontarf, Margate, Woody Point, Redcliffe, and Scarborough.
3. 6.9 percent were from the 'south-eastern coastal' suburbs of Lytton, Port of Brisbane, Wynnum, Lota, and Manly.
4. 8.0 percent were from the group of suburbs located broadly 'parallel and to the west of the Airport' site. This includes Banyo, Nudgee, Nudgee Beach, Virginia, Northgate, Nundah, Toombul, and Wavell Heights.
5. 7.2 percent of responses were from suburbs to the 'south-west', located between the Airport and the Brisbane CBD. This includes Ascot, Hamilton, Clayfield, Lutwyche, Windsor, and Woolloowin.

The newsletter survey was undertaken prior to the availability of detailed project information, such as flight tracks. It is noted however that awareness of the project in general terms is high (70 percent of telephone survey respondents), although detailed knowledge is lacking, with the largest request for further information being related to flight paths (23 percent of newsletter survey respondents).

Consequently, the origin of survey returns tends to reflect those suburbs whose residents believe they will be affected by the NPR, prior to knowledge of the actual proposal. As such it represents the extent of perceived impact of current airport operations as well as perceptions that areas could be impacted either by an increased intensity of overflights (the southern sector), the potential development of new flight tracks either from the NPR (south-west) or increased use of runway 14/32 (the coastal groupings), or from the 'lateral movement' of the NPR and its separation from residences (parallel and to the west).

There are marked differences between the concerns of those who perceive themselves as likely to be directly impacted (those most likely to return the written survey), and the broader community (the telephone survey).

Differences in values/concerns can be also discerned between the five community groupings, as summarised in **Table 9.5**. Common concerns for all groupings primarily related to overflight noise. By far the greatest concern in this regard lies in those areas who perceive that they are already affected (67 percent of the southern sector). The table also contains the results of a telephone survey of a statistically representative sample of Brisbane residents (90 percent confidence interval). As such this survey provides a valid indicator of the concerns of the wider Brisbane community.

Significant proportions of respondents did not believe they would be affected by the proposal, even within groupings where a substantial proportion of respondents were concerned about noise. For example, 20.9 percent of the 'parallel and west' grouping identified that the NPR would have no impact or an overall positive impact, as did 46.9 percent of the 'south-west' grouping. It is recognised that the survey was undertaken prior to the release of flight path information and further information needs to be provided before the community can meaningfully assess the project and its impact.

The economic benefits of the NPR were strongly recognised, even amongst respondents which perceive themselves as likely to be impacted. However nearly a quarter of those respondents in the southwest group perceived no benefit from the project.

Table 9.5: Community Survey Results.

	Telephone Survey		Written Survey				
	All Responses	All Responses	Southern Sector Grouping	Northern Coastal Grouping	South-Eastern Coastal Grouping	Parallel West Grouping	South-West Grouping
Perceived Benefits							
Regional Economic Development	13.7%	26.6%	19.6%	35.0%	34.0%	25.0%	36.7%
Efficiency and Safety	15.3%	24.2%	20.1%	32.5%	34.0%	27.1%	14.3%
Reduced Aircraft Noise in Residential Areas	7.7%	2.0%	1.4%	2.5%	2.1%	4.2%	6.1%
More Flights	4.0%	8.6%	10.5%	2.5%	2.1%	6.3%	6.1%
Noise Sharing from more Flight Paths	8.3%	1.6%	3.3%	2.5%	0.0%	0.0%	0.0%
Increased Profits for BAC	0.0%	0.9%	1.4%	0.0%	0.0%	0.0%	2.0%
Don't Know/No Comment	41.3%	26.5%	30.6%	10.0%	21.3%	25.0%	12.2%
Other	0%	0.4%	0.0%	15.0%	0.0%	0.0%	0.0%
No Benefits	9.7%	9.1%	12.9%	0.0%	6.4%	12.5%	22.4%
Perceived Impacts							
Uncertain About Future Flight Paths	4.0%	4.0%	3.8%	2.5%	8.5%	2.1%	14.3%
Noise Over Residential Areas	18.3%	41.6%	61.7%	27.5%	25.5%	62.5%	24.5%
Increased Air and Noise Pollution	n/a	4.5%	5.3%	2.5%	4.3%	8.3%	6.1%
Moreton Bay & the Environment	0%	1.0%	0.0%	2.5%	2.1%	2.1%	0.0%
Increased Road Traffic	0.3%	1.5%	1.4%	0.0%	0.0%	2.1%	2.0%
Overall Benefits	2.7%	10.5%	6.7%	7.5%	12.8%	4.2%	10.2%
Don't know/No Comment	15.0%	8.8%	4.8%	12.5%	12.8%	2.1%	10.2%
No impact	59.7%	28.1%	16.3%	42.5%	31.9%	16.7%	26.5%
Interest							
Project Need and Background	3.7%	15.8%	10.5%	5.0%	21.3%	18.8%	8.2%
Airport and Surrounds	28.0%	39.7%	26.3%	40.0%	36.2%	56.3%	53.1%
Airspace	23.7%	28.6%	46.4%	20.0%	25.5%	16.7%	34.7%
Middle Banks and Moreton Bay	28.0%	7.3%	2.9%	22.5%	12.8%	2.1%	2.0%
Nothing	21.0%	8.6%	13.9%	12.5%	4.3%	6.3%	2.0%

9.6 Relevant Statutory and Policy Requirements

As noted above, the interpretation of impact upon amenity and lifestyle must be informed by an assessment of community values, lifestyle and future aspirations. As described in Chapter A6, a number of community consultation mechanisms were implemented during the preparation of the EIS from which this information can be drawn. Where possible, this has been supplemented with information drawn from Council's forward planning and local area planning documents, such as *Living in Brisbane 2010* and the *Vision 2026* review of that document. Local area planning information at the suburb level has been discussed in the **Appendix A** suburb profiles (where available).

The *Draft Brisbane City Shape 2026* identifies the following values:

- Protection of the environment and the minimisation of air, water and noise pollution. Residents want to move towards a more sustainable lifestyle that is environmentally sensitive;
- Preservation of the friendly nature of Brisbane and its neighbourhoods, where people know and look out for each other;
- Residents value Brisbane's laid-back lifestyle, yet with a growing sophistication. Residents want Brisbane to retain the essence and spirit of a small town, even as it grows;
- Residents value Brisbane's green space, as habitat, space to play, and to break up developments;
- Residents value the city's unique quality of life and the services and infrastructure needed to maintain it. They want communities with heart and easy access to facilities.
- Residents value harmonious communities, accepting of all ages and lifestyles;
- Residents value inclusive neighbourhoods, which meet the needs of all ages and cultural backgrounds;

- A distinct Brisbane identity. Residents like the fact that Brisbane has its own identity, founded on its heritage and natural landmarks and embracing new cultures, tastes and ideas;
- The individual and varied identity and distinctiveness of each of Brisbane's suburbs is highly valued;
- Residents desire a city of opportunities, for all social and economic backgrounds; and
- Residents value an accessible city, with public transport provided where it is needed.

9.7 Assessment

9.7.1 Background

The social impact assessment of the NPR considers the analysis of the social environment (both existing and, where possible, as projected to 2015) as well as the information gathered in the community consultation program and predicts the project's likely impact, both beneficial and adverse, on regional and local communities and social infrastructure.

Operation of the NPR will commence in 2015 and has been considered at a number of points in time:

- reopening and operation of runway 14/32, between 2009-2015, after strengthening works;
- commencement of operation of the NPR in 2015; and
- the situation 20 years after opening of the NPR in 2035.

Informing the assessment a base case has been utilised, that is airport operations at 2015 and 2035 without the availability of the NPR for operations.

The SIA compares the change between this base case and NPR operational scenarios in its consideration of impact. In the most basic sense, the SIA compares the likely operational impacts of the first day of opening with the day before opening (in 2015) based upon the preferred mode of airspace architecture at those times. The SIA does not compare the situation today with the situation in 2015 with the NPR. As discussed in Chapter A2 the utilisation of Brisbane Airport is expected to increase significantly between the present time and 2015.

Commencement of NPR operations results in the alteration of airspace architecture (flight tracks) around the airport and consequently changes noise exposure in the community. Chapters D3 and D5 outlines these changes.

9.7.2 Potential Impact of Aircraft Operations at and from the NPR

9.7.2.1 Potential Impact from Changes in Airspace Architecture on the Community

Conceptually, social impact assessment examines the potential impact of a policy or project at a number of societal 'levels' - the individual/household level, the community level and the institutional level. At the individual level of assessment, the variety of personal responses to aircraft noise is great. What is untenable for one person may be acceptable to another. As such, the severity of impact from aircraft noise at the individual level can only be determined by an individual. This individual assessment will be undertaken by the community during the consultation undertaken on the draft EIS, and the results incorporated into further assessment. However, at the community level general findings can be made, based on demographic variables, that some suburbs exhibit characteristics which suggest that they would be more vulnerable to aircraft noise relative to other suburbs. Such community level assessment provides valuable input to community deliberation and the decision making process.

In summary, with the opening of the NPR in 2015, suburbs close to the existing runway or beneath some existing approach and departure paths would experience a reduction in noise exposure. These suburbs are generally to the south. Suburbs close to the new runway or beneath new approach and departure paths would experience an increase. These suburbs are generally to the south-west.

Social surveys and noise complaint patterns indicate that for most people the most noise sensitive times are night time, evenings and early mornings and weekends. The suburb level changes in 2015 with and without the NPR are assessed in **Table 5.4a** of Chapter D5 for the day period (6am to 6pm), the evening period (6pm to 10pm) and night period (10pm to 6am). These are illustrated in the

difference contours in **Figures 5.4c, 5.4d** and **5.5c** of Chapter D5. 50 suburbs will be experiencing some change in the number of overflights they receive, and consequently their exposure to noise. However, for the majority of these suburbs (approximately 70 percent), the residences in these suburbs are forecast to experience a change of less than 10 overflights in the day, five overflights in the evening and two overflights at night.

The following suburbs have been assessed in Chapter D5 as benefiting from a notable reduction in the number of overflights during the day time:

- Cannon Hill (61 percent of residences experience a reduction of 10 flights or more and 17 percent experience a reduction of 20 flights or more);
- Eagle Farm (23 percent of residences experience a reduction of 10 flights or more and 16 percent experience a reduction of 20 flights or more);
- Morningside (44 percent of residences experience a reduction of 10 flights or more and 4 percent experience a reduction of 20 flights or more);
- Murarrie (55 percent of residences experience a reduction of 10 flights or more and 22 percent experience a reduction of 20 flights or more);
- Pinkenba (95 percent of residences experience a reduction of 10 flights or more and 48 percent experience a reduction of 20 flights or more); and
- Seven Hills (29 percent of residences experience a reduction of 10 flights or more).

The following suburbs would experience a notable increase in overflights during the day time:

- Ascot (38 percent of residences experience an increase of 10 flights or more and 21 percent experience an increase of 20 flights or more);
- Balmoral (79 percent of residences experience an increase of 10 flights or more and 40 percent experience an increase of 20 flights or more);
- Bulimba (35 percent of residences experience an increase of 10 flights or more and 9 percent experience an increase of 20 flights or more);
- Hamilton (30 percent of residences experience an increase of 10 flights or more and 24 percent experience an increase of 20 flights or more);

- Hawthorne (56 percent of residences experience an increase of 10 flights or more. None experience an increase of 20 flights or more);
- Hendra (19 percent of residences experience an increase of 10 flights or more and 5 percent experience an increase of 20 flights or more);

Broadly similar results are experienced during the evening period with the NPR.

Particularly important is noise exposure during the night time. The following suburbs have been assessed by Chapter D5 as benefiting from a notable reduction in the number of overflights during the night time period:

- Cannon Hill (66 percent of residences experience a reduction of 2 flights or more);
- Eagle Farm (100 percent of residences experience a reduction of 2 flights or more);
- Hemmant (66 percent of residences experience a reduction of 2 flights or more);
- Morningside (63 percent of residences experience a reduction of 2 flights or more);
- Murarrie (30 percent of residences experience a reduction of 2 flights or more);
- Norman Park (24 percent of residences experience a reduction of 2 flights or more);
- Pinkenba (90 percent of residences experience a reduction of 2 flights or more); and
- Seven Hills (71 percent of residences experience a reduction of 2 flights or more).

No suburbs would experience a notable increase in overflights during the night time.

The information presented within **Figure 9.7a** to **Figure 9.7i** can be utilised to indicate how significant the effect of these alterations to overflights on affected suburbs would be, relative to other locations of Brisbane, based upon the number of more 'vulnerable' communities and groups present in the suburb. The six suburbs which are more negatively affected by the NPR are characterised as follows:

- Balmoral, Bulimba and Hawthorne have larger proportions of children. This will generally remain the case in 2015;
- The proportion of elderly was similar in all six suburbs in 2001, however Ascot, Hamilton and Hendra will have a notably larger proportion of elderly residents by 2015;
- Ascot, Hamilton, Hendra and Balmoral have lower rates of unemployment. Rates in Bulimba and Hawthorne whilst also favourable, are relatively higher;
- All six suburbs have a relatively low proportion of public housing;
- All suburbs, except Balmoral, have a relatively low proportion of sole parent households;
- Hendra and Balmoral have higher rates of residential stability, suggesting the presence of more stable communities.
- The proportion of residents engaged in industries with a higher presence of shift workers was relatively lower in Ascot, Hamilton and Balmoral;
- The number of residents of hospitals and nursing homes (non-private dwellings) was notable in Hamilton. The number was also higher in Bulimba, Hawthorne and Ascot.

The six affected suburbs share a number of similar socio-economic characteristics. Those suburbs to the north and south of the river can be further grouped by some shared communities of interest (e.g. retail and community facilities). The SEIFA indicator of Disadvantage⁶ identifies that the six affected suburbs are relatively advantaged in comparison to Brisbane in general. In comparison, the SEIFA index identifies that, in general, those suburbs which are benefited by the NPR (Cannon Hill, Eagle Farm, Hemmant, Morningside, Murarrie and Pinkenba) are relatively more disadvantaged than those affected.

⁶ *The Socio-Economic Indexes for Areas (SEIFA) is a summary tool developed by the ABS which provides four measures to rank areas based on their relative social and economic wellbeing. SEIFA utilises a statistical technique which summarises the range of questions asked in the Census into one summary figure. Essentially, the lower the number the more disadvantaged an area is in relative terms.*

Figure 9.7a: Distribution of Population 0-14 Years of Age, 2001

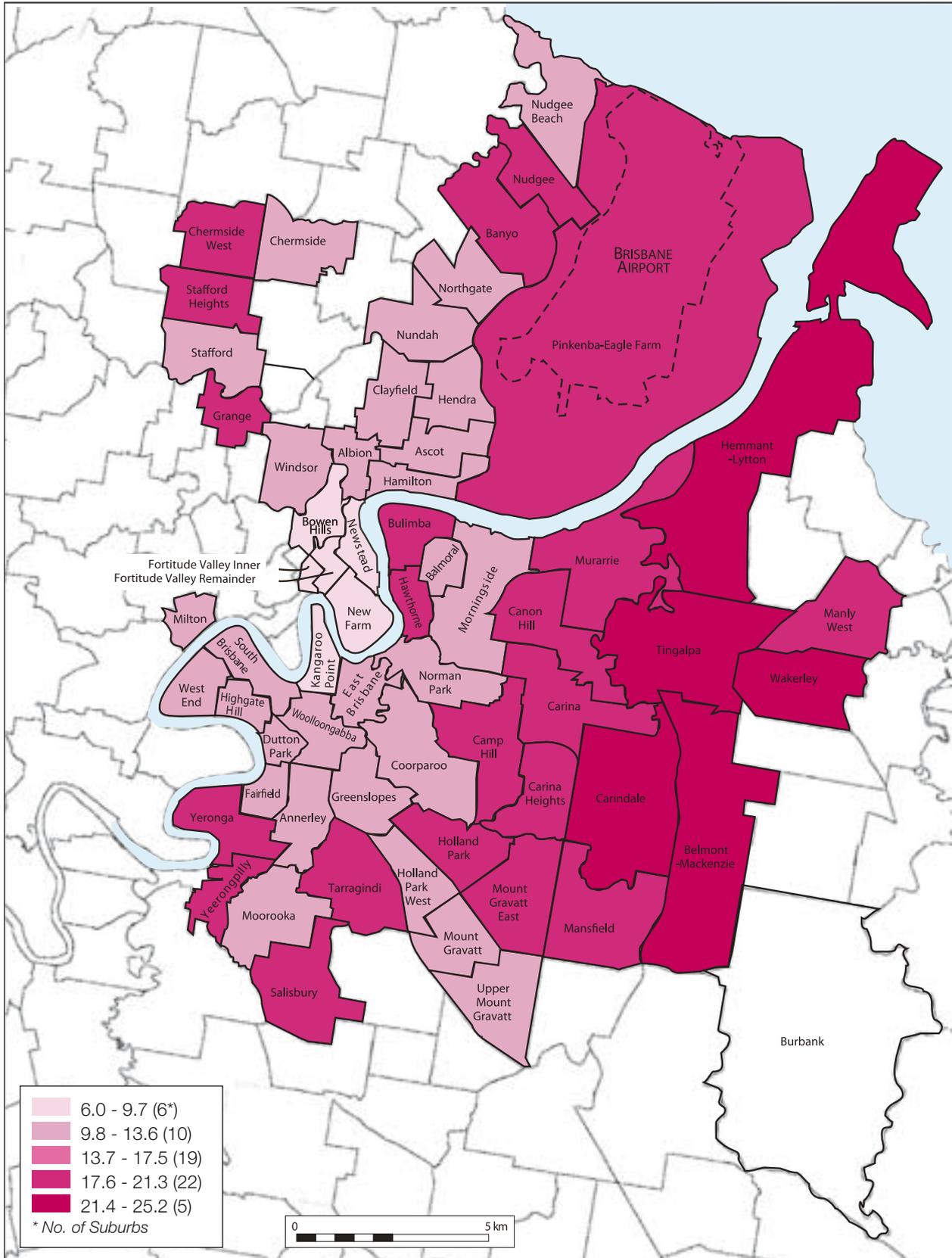


Figure 9.7b: Distribution of Population 75+ Years of Age, 2001

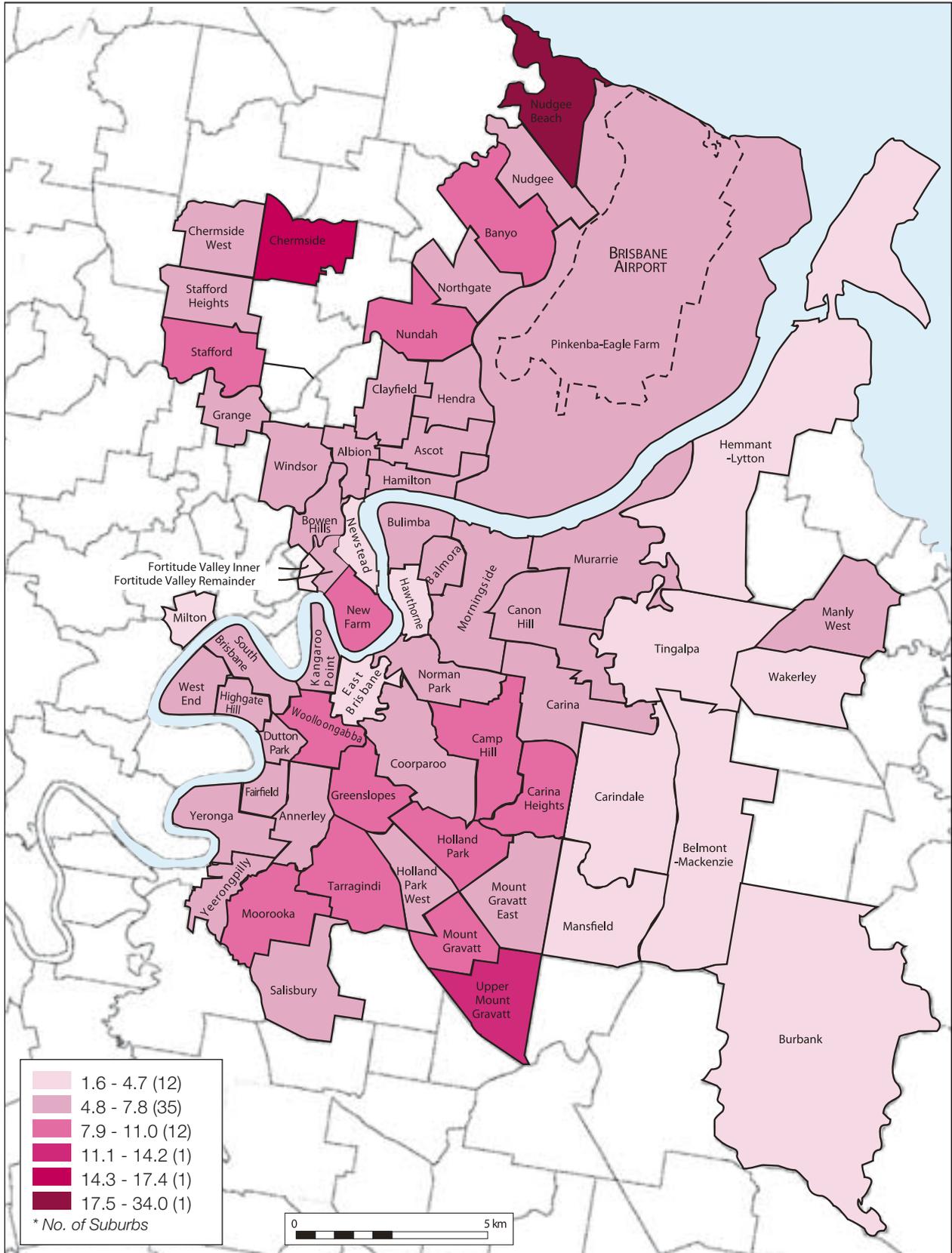


Figure 9.7c: Distribution of Population 75+ Years of Age, 2011

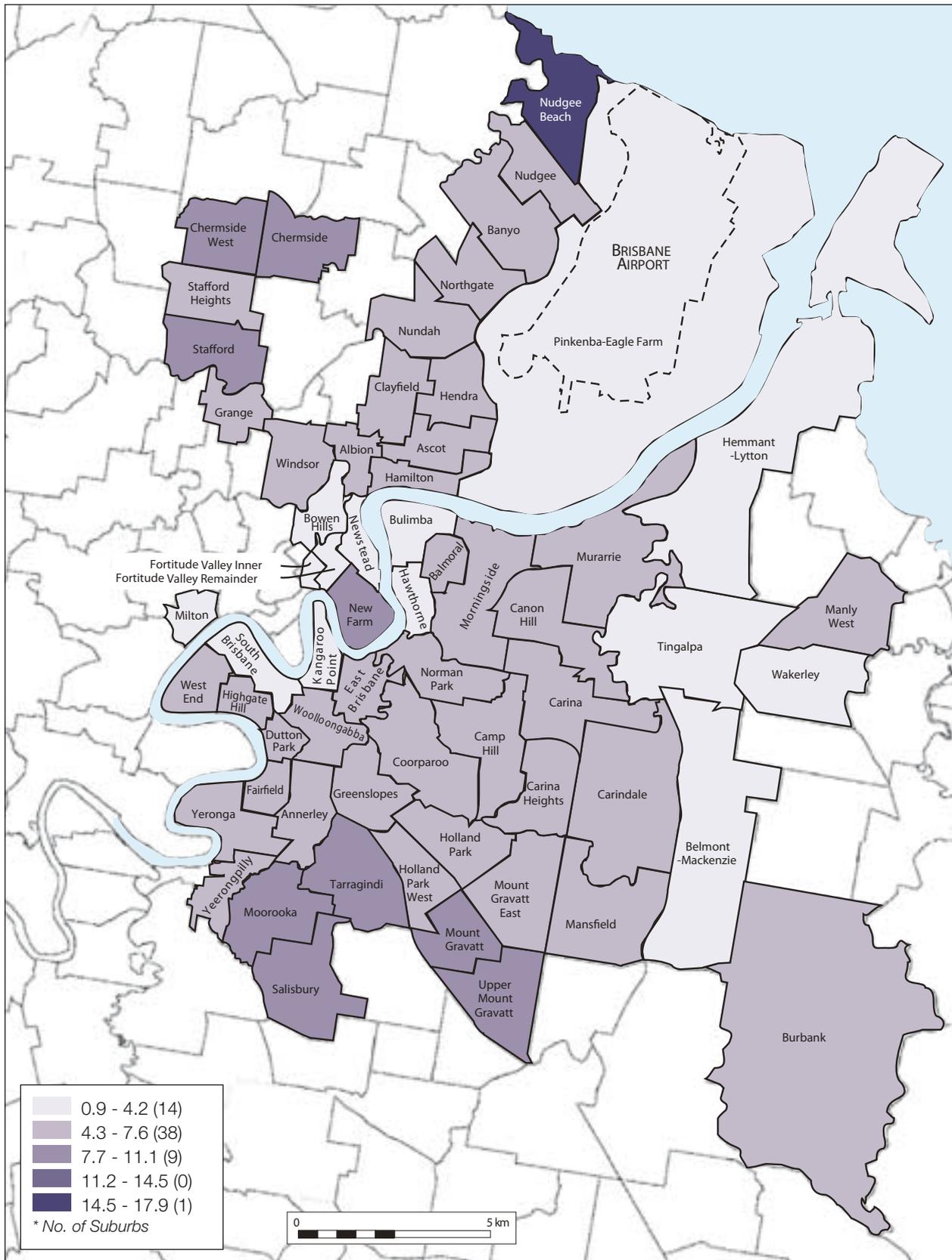


Figure 9.7d: Distribution of Unemployed, 2001

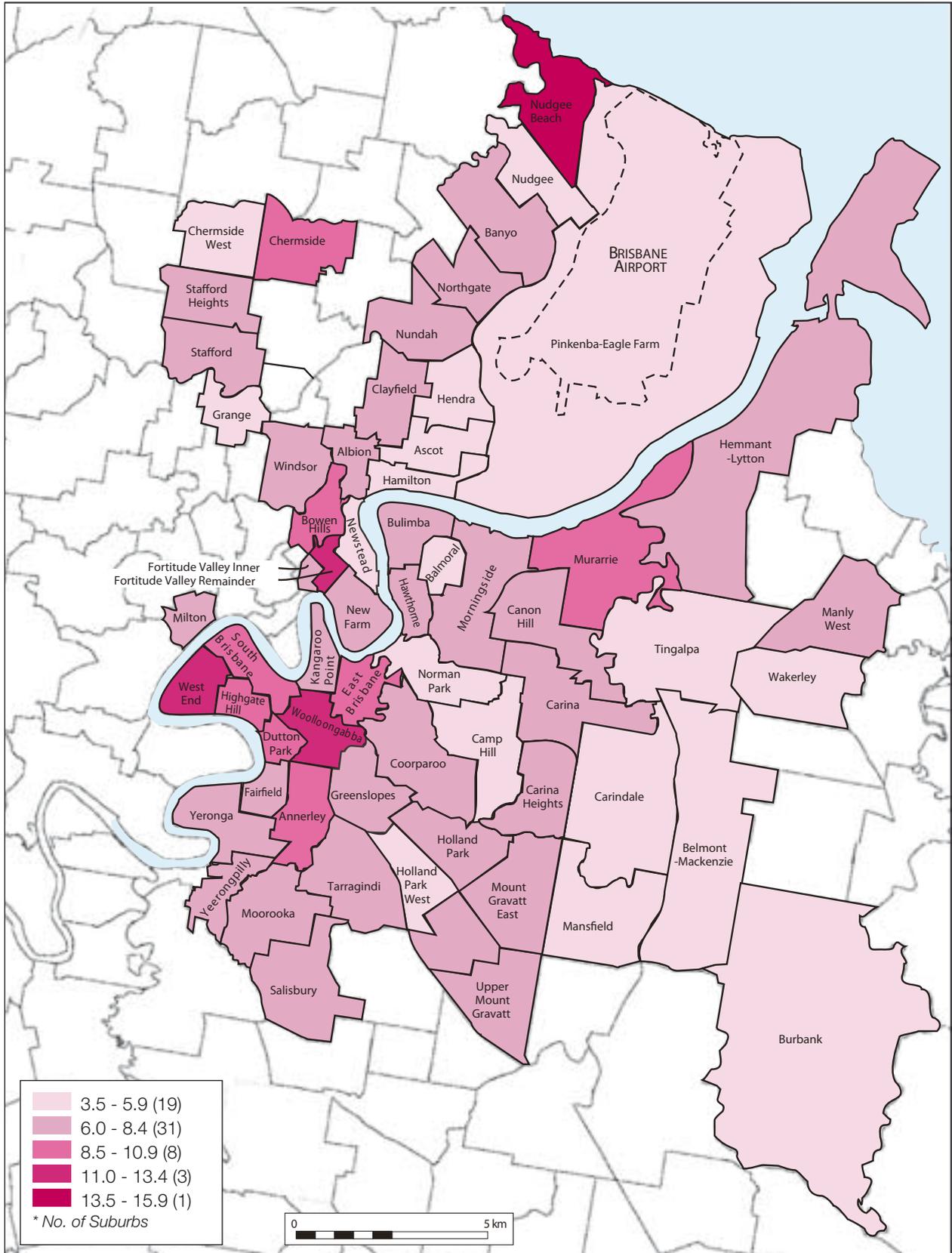


Figure 9.7e: Distribution of Housing Authority Dwellings, 2001

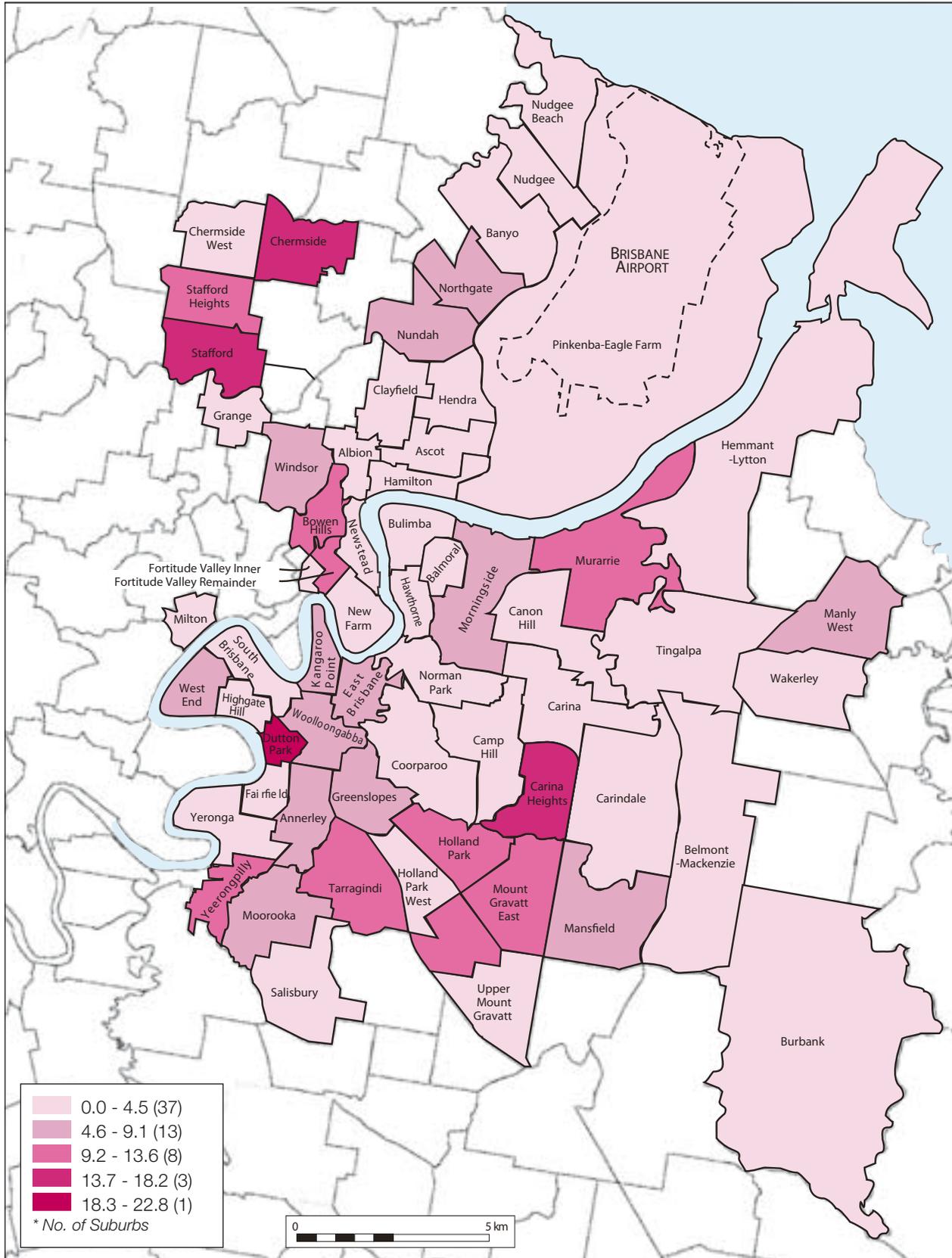


Figure 9.7f: Distribution of Single Parent Families, 2001

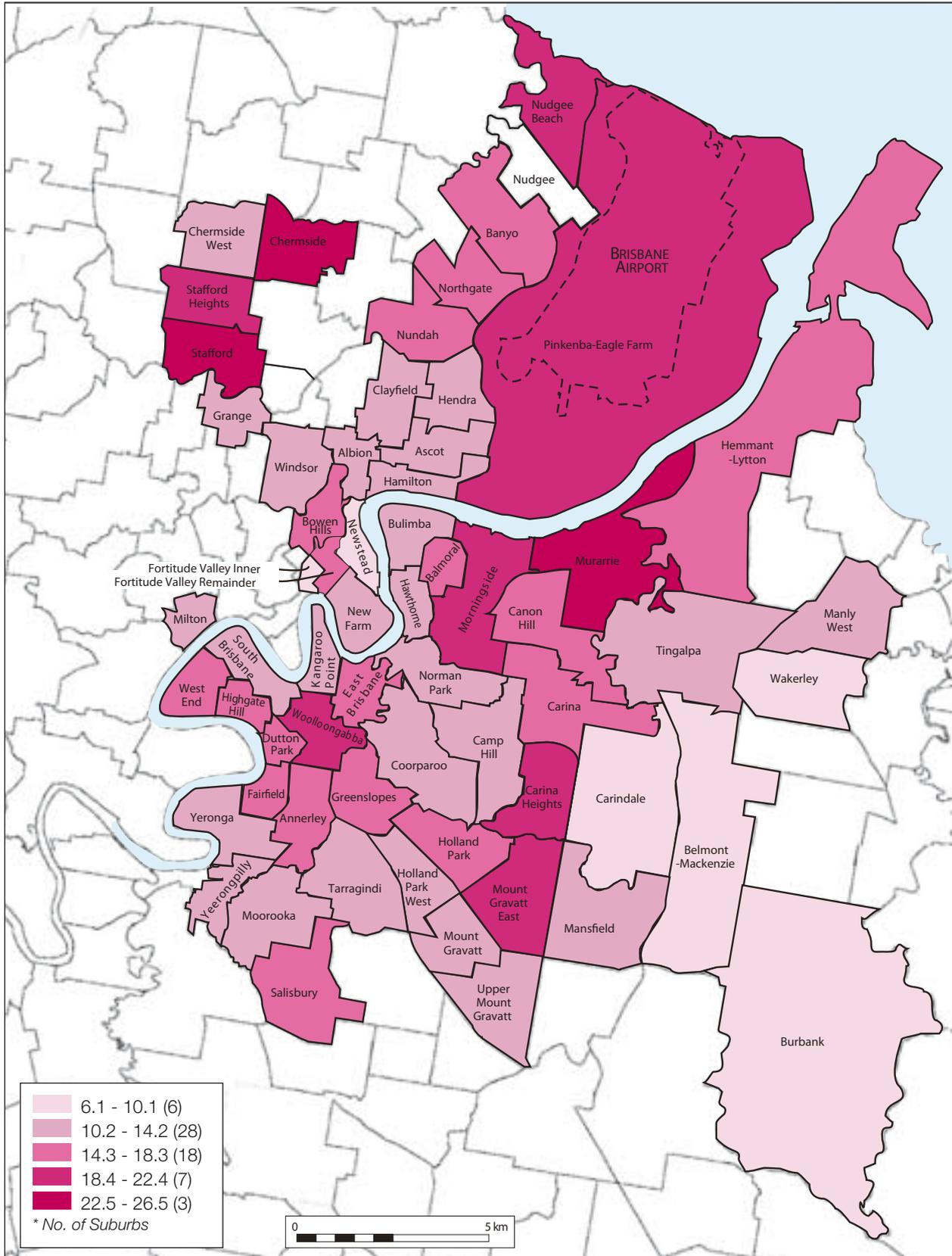


Figure 9.7h: Distribution of Shift Workers

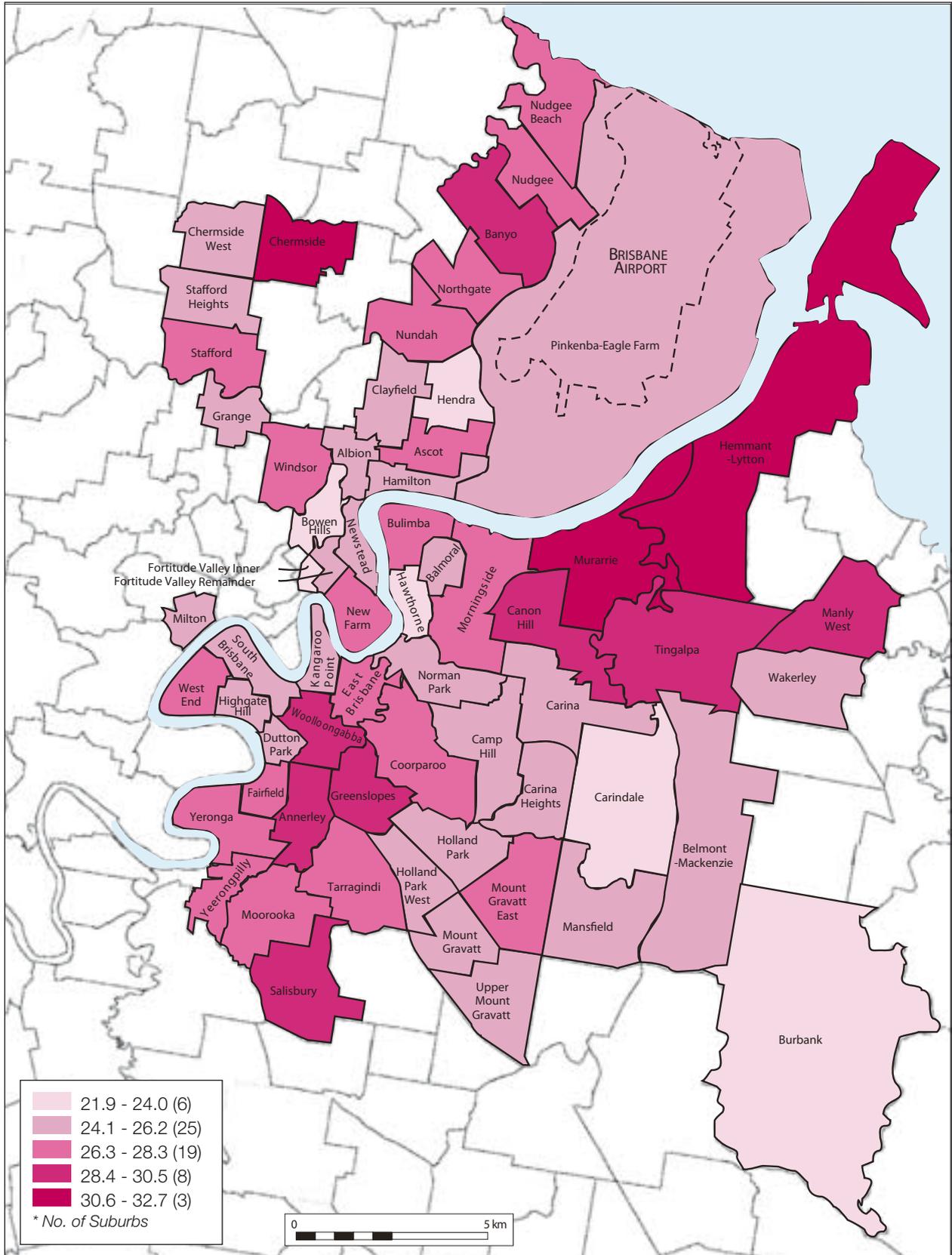
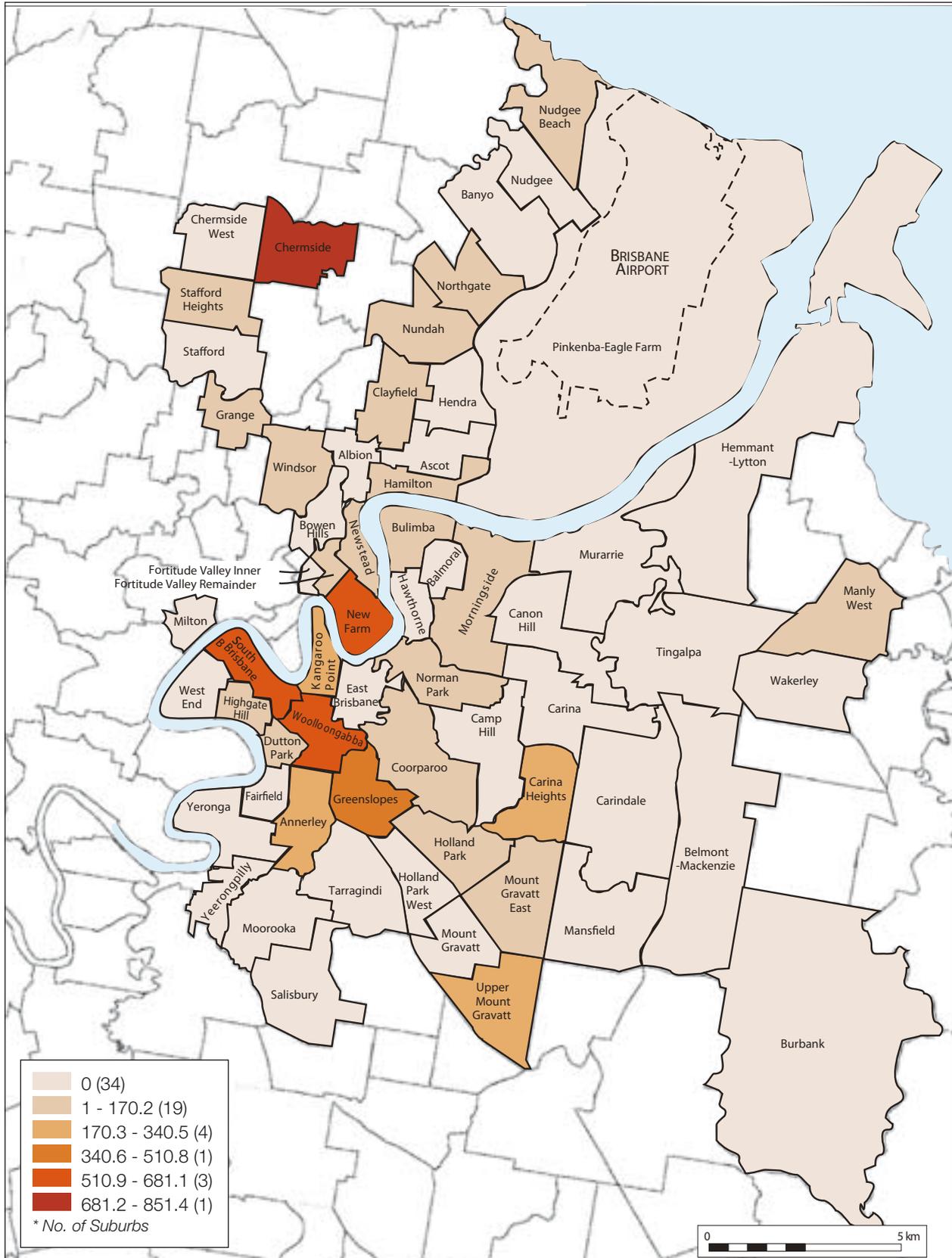


Figure 9.7i: Non-Private Dwellings



The available data suggests that, at the community level, the six affected suburbs exhibit a generally lower level of vulnerability and are more resilient relative to some other suburbs in the study area (such as some of those suburbs which would receive less overflights due to the NPR), and generally access to more resources with which to adapt to the change proposed. The larger number of elderly residents does however suggest higher vulnerability to sleep disturbance in the group of suburbs located to the north of the river.

However, this is not to say that these suburbs will not experience social impacts from the NPR. Increased noise from overflights could affect the way of life of residents of these suburbs - how they live, work, play and interact with one another on a day to day basis. In high doses, noise can affect sleep or disturb rest and relaxation, generate stress and annoyance, affect educational achievement, interfere with speech or job performance, and contribute to a number of physiological and mental health effects. Such potential impacts are evaluated in Chapter D7. At the individual level, these impacts affect quality of life.

The effect on lifestyle can be ancillary, affecting everyday behaviour (for example, closing windows, not using balconies, disrupting conversation, reading or watching TV). Such affects are generally measured by annoyance, as undertaken in Chapter D7.

It can affect use and enjoyment of outdoor spaces (e.g. conversations in cafés along Racecourse Road in Hamilton) or recreational facilities.

There is evidence that noise may have an effect on community cohesion, with some research suggesting for example it can reduce helping behaviour (Berglund & Lindvall 1995). It is not considered likely, however, that changes in noise exposure due to the NPR would engender population segregation or a general deterioration of those residential areas affected. The potential effect on property values, assessed in Chapter A2 lends support to this position. The six affected suburbs are amongst the most desirable residential locations in Brisbane. Their desirability can be attributed to a number of factors (such as their attractive urban character and proximity to the city) which will be unaffected by the NPR.

The residential amenity of the six affected suburb areas will be negatively altered by the NPR, to varying degrees as perceived by individual residents. Conversely, the amenity of those suburbs receiving less overflights will improve.

In this regard the negative impacts experienced in one part of Brisbane are offset by the positive benefits gained by other parts. The above social impacts are likely to be experienced in Ascot, Hamilton, Hendra, Balmoral, Bulimba and Hawthorne. A lessening of existing levels of social impact will be experienced in Cannon Hill, Eagle Farm, Hemmant, Morningside, Murarrie, Norman Park, Pinkenba and Seven Hills.

The balance between positive and negative impacts is demonstrated in the analysis within the HIA in Chapter D7, which found that on opening of the NPR in 2015 there will be:

- An minor net reduction of people little sleep disturbed, sleep disturbed and highly sleep disturbed;
- An increase of 17 childcare and kindergartens subject to potential noise-induced awakenings;
- An additional 5,000 shift workers potentially affected by daytime noise-induced awakenings resulting from aircraft noise. It is also estimated that there will be 15,000 shift workers potentially affected by evening noise-induced awakenings;
- A reduction of approximately 185,000 people potentially affected by night time noise-induced awakenings resulting from aircraft noise;
- An increase of approximately nine schools subject to communication interference for the Summer Weekday Day; and
- An increase of approximately seven places of worship subject to communication interference for the Summer Weekday Day. This increases to 27 for the Winter Weekend Day.

9.7.2.2 Potential Effect on Radio and TV Reception

It has been documented that domestic television reception can be affected by 'flutter' or 'ghosting'

⁷ Coded Orthogonal Frequency Division Multiplexing (COFDM)

due to passing aircraft. Ghosting is the TV signal arriving at the television antenna from two or more different directions, with a slight lag between each. This can be caused by the aircraft body reflecting the television transmission signal. Aircraft may also affect the reception of digital TV services, as there is a threshold of the tolerance of COFDM⁷ reception to the flutter (or Doppler echo) caused by aircraft. Issues have also been identified for those utilising Teletext on their televisions, whereby letters in the captions become jumbled to cause spelling errors and possible confusion. As identified in **Table 5.4a** of Chapter D5, some suburbs will receive an increase in the number of overflights, whilst some suburbs will receive a decrease, and the risk of ghosting will therefore later accordingly. If reception difficulties are experienced, the households TV antenna system can be adjusted away from possible re-transmission sources or be upgraded to address the issue.

9.7.2.3 Potential Impact From Changes in Airspace Architecture on Social Infrastructure

Apart from residential dwellings, a range of social infrastructure will be affected by a change in airspace architecture. Facilities in suburbs generally to the south of the airport would experience a reduction in noise exposure. Facilities in suburbs generally to the south-west would experience an increase. The sensitivity of community facilities varies. **Table 9.7a** summarises the 'overall' change in terms of exposure to 70 dBA overflights for community facilities which may be more noise sensitive (e.g. health, aged and child care centres, places of worship, educational and recreation facilities).

It is noted that the individual experience of each facility affected will be different, dependent upon factors such as the building in which it is located, its type of client groups (in terms of their vulnerability), the number of patrons attending, and its mode or times of operation. The location of individual facilities, relative to the predicted N70 noise contours is included in **Figures 9.4a** to **9.4e**. The amenity of individual facilities will be affected (either positively or negatively) to varying extents. Generally, it is considered unlikely that the change in the noise environment would result in the

closure of any facility. It would not significantly alter patterns of demand for services. Some recreational areas may become less desirable to some more noise sensitive people, whilst others (such as the regionally important Minnippi Parklands at Tingalpa) would become more amenable. The use of some sporting fields may be somewhat impacted if noise was to interfere, for example, with the refereeing of weekend sports.

In terms of specific educational facilities, **Table 9.7b**, identifies the schools which would experience a notable increase or decrease in overflights when the NPR become operational.

The potential impact on educational achievement of school students is assessed in the HIA in Chapter D7. It is not considered likely that changes to the noise environment would affect school attendance and therefore viability.

Table 9.7a: Estimated Change in the Number of Community Facilities Exposed to 5 or more 70 dBA Overflights Resulting from Opening NPR in 2015 for Summer Weekday Day.

Facilities	Estimated Change in the Number of Community Facilities Exposed to 70 dBA Overflights
Childcare and Kindergartens	-1
Hospitals	+1
Nursing Homes and Aged Care	0
Retirement Homes	0
Schools	+9
Places of Worship	+7
Youth Clubs and Centres	0
Clubs	+5
Community Centres	+1
Libraries	+3
Recreation Areas	+7
Golf Courses	-1
Swimming Pools	0
Tennis Courts	-1

Table 9.7b: Noise Effects on Schools in 2015 for Summer Weekday Day.

> 10 N70 Overflight Increase	5-10 N70 Overflight Increase	> 10 N70 Overflight Decrease	5-10 N70 Overflight Decrease
TAFE Brisbane North Institute Gateway Campus, Eagle Farm	Hendra Primary	Pinkenba Primary	TAFE Southbank Institute Morningside Campus Seven Hills
Hamilton Primary	Morningside Primary / Morningside Preschool	Cannon Hill Anglican College	Cannon Hill Primary
Bulimba Primary	Lourdes Hill Catholic College Hawthorne	Murarrie Primary / Murarrie Preschool	Seven Hills Primary
St. Peter & St. Pauls Catholic Primary, Balmoral	Balmoral High		

9.7.2.4 Potential Impact from Ground Operations

The potential for noise generated by aircraft taxiing, on take-off roll, or using reverse thrust after landing has been assessed in Chapter D5. Noise levels from aircraft performing take-off, reverse thrust and to a lesser extent taxiing on the NPR are likely to be audible on occasion at some of the nearest residential locations under adverse meteorological conditions. However no residences will be affected by noise levels predicted to exceed 70 dBA. In this regard there will be a negligible alteration to residential amenity.

However, the Mercy Aged Care facility could be impacted by reverse thrust operations exceeding 70 dBA for a proportion of evening and night periods (40 percent of the time during summer nights). Mercy Aged Care Services is a sensitive noise receptor with a heightened vulnerability. At the site, Mercy Aged Care Services operates the Emmaus Residential Aged Care Facility and three cottage facilities. Emmaus provides over 70 beds for residents with both high and low care needs, and the cottages house 34 permanent and two respite residents. As identified in Chapter D7, the elderly are more at risk to sleep disturbance and communication interference. Accordingly, operations at the NPR will be managed to control the use of reverse thrust for night-time operations. This will seek to ensure that the likely social impact on this facility is negligible.

There is no proposal to alter the procedures governing aircraft engine testing at the Airport in conjunction with the NPR project, and hence there would be no change to the present noise impact from this source.

9.8 Cumulative and Interactive Effects

There are no known projects which would act in a cumulative manner with overflight noise. Noise from aircraft and noise from transport and construction are different in nature and have varying levels of community acceptability and design criteria.

9.9 Assessment Summary Matrix

Table 9.9 provides an assessment summary matrix for social impacts issues related to aircraft noise and operation of the New Parallel Runway.

Table 9.9: SIA Assessment Summary Matrix.

Impact Name	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description in Words	Significance Criteria		Description in Words	Significance Criteria
Potential effects on the amenity, lifestyle and everyday activities.	Alterations from overflight could affect the way of life of residents of the affected suburbs - how they live, work, play and interact with one another on a day to day basis.	At the community level, social impacts range between moderate adverse and moderate beneficial depending on the suburb. Available data suggests that, at the community level, the six negatively affected suburbs are relatively more resilient, however they will suffer social impacts. The significance of impacts at the individual level cannot be determined. D, P, LT	These are unavoidable impacts if the NPR is to operate. The location of flight tracks is determined by safety and airspace design considerations.	Refer Description of Impact column.	Refer Description of Impact column.
Potential Impact on Social Infrastructure.	Alterations from overflight could affect the amenity of individual facilities (either positively or negatively) to varying degrees.	Minor adverse to Minor beneficial. D, P, LT	These are unavoidable impacts if the NPR is to operate. The location of flight tracks is determined by safety and airspace design considerations.	Refer Description of Impact column.	Refer Description of Impact column.

Key to Abbreviations

- Major, high, moderate, minor, negligible
- +ve or -ve (positive or negative)
- D, I, C, In (direct, indirect, cumulative, interactive)
- P, R (permanent, reversible)
- ST, MT, LT (short term, medium term, long term)