5.2 LUMINS Stage 2 2009

L U M I N S

Land Use Management and
Insulation for Airport
Noise Study

STAGE 2

SEPTEMBER 2009

Prepared for Air Noise Management Committee
by Boffa Miskell Ltd

LUMINS
STAGE 2

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prepared for the Air Noise Committee by

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INTRODUCTION

This report presents the findings of Stage 2 of the Land Use Management and Insulation For Airport Noise Study (LUMINS). The overall purpose of LUMINS is to determine the future management of land uses *and* noise insulation for the properties within the area described by the Wellington International Airport Air Noise Boundary (ANB).

Stage 1 of LUMINS (refer Land Use Management and Insulation for Airport Noise Study (LUMINS) 2006) considered:

- The extent to which residential and other noise sensitive activities are likely and able to intensify within the ANB;
- Whether people's health would be affected by airport generated noise and if so what the extent of that effect was; and
- Whether, based on the findings of Stage 1, LUMINS should proceed with Stage 2.

In its conclusion, Stage 1 identified that there *was* a need to proceed to Stage 2 of LUMINS because:

- Residential and other noise sensitive development could significantly intensify within the ANB under the existing District Plan provisions.
- The extent of the effect of aircraft noise on the future population likely to be residing inside the ANB could be significant.

LUMINS STAGE 2 SCOPE & OUTCOMES

The scope of LUMINS Stage 2 is to address the matters identified in Stage 1. The aspects of Stage 2 relating to insulation have been completed. A summary of the findings of this is included on the next page. The Stage 2 Land Use Study is accordingly focussed on the following outcomes which are to:

- Examine the land uses within the ANB that are incompatible with the prevailing and forecast noise environment
- Determine the effectiveness of existing planning instruments in promoting compatible land uses and minimising incompatible land uses
- Determine the changes required to planning instruments to promote more compatible land uses within the ANB.

PHASES

To address the scope and produce the outcomes sought the work has been conducted in three phases. It is noted that this work has also been conducted in parallel with the Wellington Airport Master Plan process. These three phases are described below:

PHASE 1 | BACKGROUND

Backgrounds previous LUMINS work, considers the broad strategic city planning context, and identifies the landuses and characteristics of the area which affect compatibility with the noise environment.

PHASE 2 | LAND USE OPTIONS

Considers the land use options that may be possible within the area and the types of criteria that need to be considered in determining compatibility of future development.

PHASE 3 | EVALUATION AND ACTIONS

Evaluates the land options for the area and identifies the elements required within a strategy for land use management under the relevant planning instruments.

The outcomes of these three Phases are represented by the three parts of this report.

PART 1 | BACKGROUND

COMMUNITY SURVEY

A survey of households within the ANB was carried out by Colmar Brunton in January 2008. The following conclusions were drawn from this research which generated 181 responses.

Overall, the respondents were satisfied with living in the area. Many respondents have lived in their homes for years and few have complained about noise originating from the airport.

However, the survey findings indicated that airport noise does have some negative impact on living conditions. Significant numbers of the respondents said that airport noise interferes with their conversations and their TV. Those living in the high L_{dn} zone (the noisiest part) are most likely to be affected. Furthermore, respondents rated airport noise as the community feature most needing improvement, as well as the feature that has the most negative impact on their satisfaction with living in the area.

These findings may seem in contradiction to high levels of satisfaction and low numbers of formal noise complaints. It is possible that the many positive features of the location, such as convenience to shops and amenities offsets concerns about airport noise to some extent.

However, given the location of the homes, it is also possible that some respondents have come to accept airport noise as 'normal', and that some daily interruption is inevitable. There is evidence to suggest that respondents have adapted to airport noise over time. Results illustrate that those who own their home and who have lived in the ANB for a longer period are less likely to say that airport noise has a substantial negative impact on their overall satisfaction. Furthermore, those who have lived in their home for less than three years are more likely than average to say that airport noise wakes them up, or makes them keep their windows shut when they would prefer to have them open.

Finally, it appears that few households have had alterations to reduce the impact of noise from the airport. Ceiling insulation is the most common kind of alteration, and just over one third of those alterations were done at least partly to reduce airport noise. Those who have lived in their home for a longer time are more likely to report having added ceiling insulation. Those in the high L_{dn} zones are more likely to be unsure whether alterations have been made to their home. This is consistent with results indicating that they have lived in their homes for a shorter periods of time and that they are less likely to own their homes.

Satisfaction with living in the area

- The survey findings indicated that the vast majority of respondents within the ANB (92%) were either quite satisfied or very satisfied with living in their local area. Some of the main reasons for being satisfied included convenience to shops (38%) and amenities (26%), and a friendly local community (21%).

- The key reason for moving into the area was affordable housing (27%). Over half of the respondents (60%) have lived in their homes for 7 years or more, indicating that for many respondents the area is an attractive place to live.

- Around one quarter of respondents said that it is at least quite likely that they will move in the next two years. The main reasons for wanting to move were airport noise (15% of those intending to move), needing more room or a bigger home (14% of those intending to move), and buying a home (13% of those intending to move).

Airport noise in relation to other community issues

- Respondents were asked to indicate how much negative impact a variety of issues have on their satisfaction with living in their area. They could answer on a scale from 0 (no negative impact) to 10 (large negative impact). The majority of respondents (86%) indicated that airport noise has at least some negative impact on their satisfaction (ie, they gave a score above 0). Of the ten issues mentioned in the survey, respondents felt that airport noise, traffic congestion, crime, and vandalism have the most negative impact on their satisfaction. Respondents in the high L_{dn} zone were more likely than those in the medium and low zones to give airport noise a score of 3 or above (77%, compared to 62% and 58% in the med and low zones, respectively).

- To get a sense of the importance of reducing airport noise relative to other areas for improvement, respondents were asked to allocate hypothetical Council funds to improve services or facilities in their area. On average, respondents allocated the most money to reducing noise from the airport. This was over and above other facilities such as roads and footpaths, reducing traffic congestion, and children's playgrounds.

Impact of airport noise

- Seventy percent of respondents said that airport noise interferes with their conversations, and half (50%) said that it interferes with their TV. Respondents in higher L_{dn} zones were more likely than those in the low L_{dn} zone to say that airport noise interferes with their TV, that it wakes them up, and that it makes them keep their windows shut when they prefer them to be open.

- Overall, respondents felt that airport noise annoys them more when they are outdoors than when they are indoors. Just over half of respondents who say airport noise has at least some negative impact (53%) said that airport noise disturbs them more outdoors.

- Respondents said that the most annoying type of noise is aircraft taking off. Half of all respondents who said that airport noise has at least some negative impact (50%) said that aircraft taking off is at least moderately annoying, compared to one third (33%) who said that aircraft landing is at least moderately annoying. Around one quarter of respondents who felt that airport noise has at least some negative impact on their satisfaction said that engine testing (23%) and aircraft taxiing (25%) is at least moderately annoying.

- The time when airport noise annoyed respondents the most is weekdays from 6pm to 10pm (33% who said that airport noise has at least some negative impact on their satisfaction said that noise is at least moderately annoying during this time). The least annoying time is weekdays from 9am to 6pm, when many respondents are not home.

Complaints about airport noise

- Few respondents (7%) reported ever having made a complaint about airport noise. Only eight respondents that were interviewed had made a complaint in the last 12 months. Twelve percent (12%) of respondents intended to make a complaint but had not done so. This proportion was higher in the high and med L_{dn} zones than in the low L_{dn} zone (14% and 15% in the high and med zones, respectively, compared to just 8% in the low Ldn zone).

Homes in the ANB

- According to respondents, 44% of homes have had their ceilings insulated since construction (just over one third of these for sound proofing purposes). Twenty three percent of homes have had their walls insulated since construction (just over one third of these for sound proofing), 21% have had seals placed around doors and windows (two thirds of these for sound proofing), and 9% have had double-glazed the windows installed (three quarters of these for sound proofing).

LUMINS STAGE 2 INSULATION REPORTS

Three reports were carried out to look at costs of insulation to residential and educational buildings within the ANB. These are:

- *Indicative Order of Cost Report for Noise Study (LUMINS)* by Rider Levett Bucknall dated 31 July 2007
- *Estimate of Cost Report for Airport Noise Study LUMINS Stage 2 Acoustic Assessment New Houses* by Rider Levett Bucknall dated 19 December 2007
- *Lumins Stage 2 Educational Facilities Acoustic Insulation Assessment* by Malcolm Hunt Associates dated August 2008

The following results were obtained from these studies:

1. The cost of insulating existing houses inside the Air Noise Boundary (Item 2(l)).

Work was first carried out by Rider Levett Bucknall (RLB and formerly Rider Hunt), which was then peer reviewed by Beca. Their estimates are tabled below. It is noted the Beca estimate accounts for only a ventilation system to houses newer than 1997. The RLB estimate does not allow for this ventilation cost. The Beca estimate has calculated different model houses based on size, number of storeys and scope of work. The RLB estimate only allowed for one house type as their model. The size of this house was larger than the average house in the area and did not account for houses of more than 1 storey.

The Beca estimate recognises the potential for variation from the standard model house and has determined a cost for the houses which differ from this. The Beca estimate includes a risk register which values items which have the potential to impact on costs.

Estimator	Internal noise environment	Cost	Adjusted cost1
Rider Hunt	L_{dn} 45 dB	$17 million	$23 million
	L_{dn} 40 dB	$43 million	$54.7 million
Becas	L_{dn} 45 dB	$22 million	$28.1 million
	L_{dn} 40 dB	$33.5 million	$45.2 million

(Reported Footnotes)

1 The 'adjusted cost' column takes into account the cost of acquiring the balance of houses within the L_{dn} 75 dB sound exposure contour that Wellington International Airport Limited (WIAL) does not already own. The costs of insulating houses within this contour relative to the value of the house are considered so high that it is assumed more cost effective to acquire and demolish [it is also known that the adverse health effects at this level can be high]. For internal noise environments of L_{dn} 45 dB the cost of insulating houses within the L_{dn} 75 dB sound exposure contour has been subtracted from the total costs of insulation, and the cost of acquisition of the balance of houses not owned by WIAL within this contour added. For internal noise environments of L_{dn} 40 dB the costs of insulation of dwellings within the L_{dn} 75 dB sound exposure contour were so prohibitive that they were left unassessed by Rider Hunt and Becas. That allows the costs of acquisition of the balance of properties not owned to simply be added to the costs of insulation of dwellings in the remaining contours.

It is conservatively assumed 26 properties will need to be acquired, @ $450,000 = $11.7 million.

2. The extra cost of insulating **new** houses (Item 2(II)).

Internal noise environment	Noise Band1	Insulation Category	Extra cost
L_{dn} 45 dB	1 (L_{dn} 65- 67 dB)	No Action	Nil
L_{dn} 45 dB	2 (L_{dn} 68- 69 dB)	A	$8000
L_{dn} 45 dB	3 (L_{dn} 70- 74 dB)	B	$13,000
L_{dn} 40 dB	1 (L_{dn} 65- 67 dB)	B	$13,000
L_{dn} 40 dB	2 (L_{dn} 68- 69 dB)	B	$13,000
L_{dn} 40 dB	3 (L_{dn} 70- 74 dB)	C	$23,000

(Reported Footnotes)
1 L_{dn} 75+ dB not assessed, since it assumed no houses will be permitted to be constructed within this band.
Note also that this cost does not include mechanical ventilation and is the cost of insulation only.

3. The cost of insulating existing educational facilities [to L_{dn} 40 dB internal noise environment]

Facility	Sub components	Cost
Miramar South School	Main Classrooms	$17,000
	Old Block	$16,000
	Hall	$113,000
	Prefabs	$38,000
A'Oga Amata Preschool (On Miramar S. School site)		$55,000
Early Years Childcare Centre (Salek Street)		$81,000
Total		$320,000

4. Impact of insulation against property values

The comments of Richard Chung, Wareham Cameron are repeated below:

"In respect of insulation costs, we note that these have been divided into various tranches by Rider Levett Bucknall. The A, B, and C categories reflect costs per house in the range of $13,000 to $28,000. The nature of this work (insulation of ceilings, window and door sealing, installation of an airflow system) are predominantly 'non visual' and we do not believe such costs would be captured in higher process/values....the LUMINS stage 1 report noted "there appears to be only a weak correlation between housing value and proximity to the airport", suggesting the market does not really distinguish between housing in the ANB vis a vis outside the ANB. We suspect the same would generally apply in comparing two houses that were the same, bar one had works A, B or C ie the spend would not be additive per se in terms of market pricing, notwithstanding the improved utility of the dwelling. If the work extended to cat. D...($124, 000 which extends to new external linings to exterior walls, wall and ceiling insulation and replacing windows or glass), then we suspect there would be a positive impact on value, but nowhere near the costs of the work."

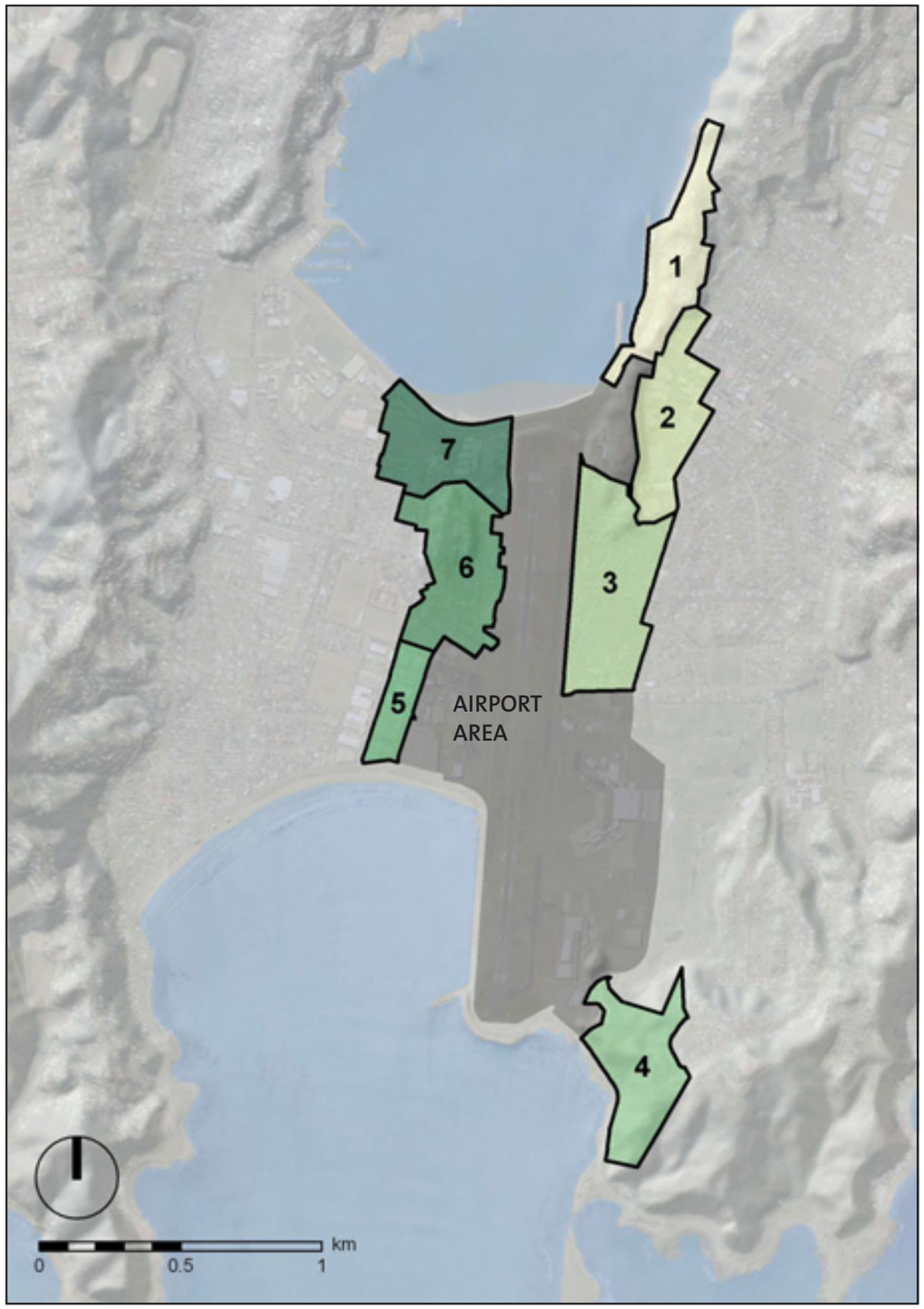


DIAGRAM 1: PLAN OF AIR NOISE BOUNDARY SHOWING PRECINCT AREAS

CURRENT AND FUTURE LAND USE

The area within the Air Noise Boundary (ANB) is large (232 hectares of which the airport is some 110 hectares). Within the ANB there is some variation in characteristics from one place to another. These characteristics are described in the following pages with a view to understanding the place-based issues that affect current compatibility with the noise environment and the potential for accommodating future land use changes. To assist this characterisation the ANB area has been considered in 'precincts' and these are described in Diagram 1 and the text below.

PRECINCT 1

In Maupuia on the east side of Evans Bay, north of Miramar Avenue and northwest of Maupuia Road. Land use is a mix of industrial/commercial and residential.

PRECINCT 2

In Miramar on the northeast side of the airport. Cobham Drive, Calabar Road and Maupuia Road define the western boundary of the precinct. Stone Street and Southhampton Street define the eastern boundary (this is also the eastern limits of the ANB). The southern boundary of the precinct is defined by the edge of the industrial area on Wexford Road. Land use is industrial/commercial.

PRECINCT 3

In Miramar on the eastern side of the airport. Hobart Street defines the eastern boundary (this is also the eastern limits of the ANB). Broadway Street defines the southern boundary. The northern boundary of the precinct is defined by the edge of the industrial area on Wexford Road. Land use is mainly residential, with educational and a small area of industrial.

PRECINCT 4

In Strathmore Park/ Moa Point on the southeastern side of the airport. The northern boundary is defined by the Miramar Golf Course. The southern and western boundaries of the precinct are defined by the edge of Rangitatau Reserve and Lyall Bay. Land use is a mix of residential, open space and utility services.

PRECINCT 5

In Rongotai on the southwestern side of the airport. Part of Rongotai College defines the northern boundary of the precinct. The Lyall Bay coastline borders the southern boundary. The western boundary is defined by Kingsford Smith Street. Land use is industrial/commercial.

PRECINCT 6

In Rongotai on the west side of the airport, south of Rongotai Road and north of the Suburban Centre Area on Kingsford Smith Street. Land use is residential and a small area of industrial.

PRECINCT 7

In Rongotai/Kilbirnie on the northwest side of the airport, north of Rongotai Road. The northern boundary is defined by Evans Bay and the western boundary by the western limits of the ANB. Land use is industrial and a small area of residential.

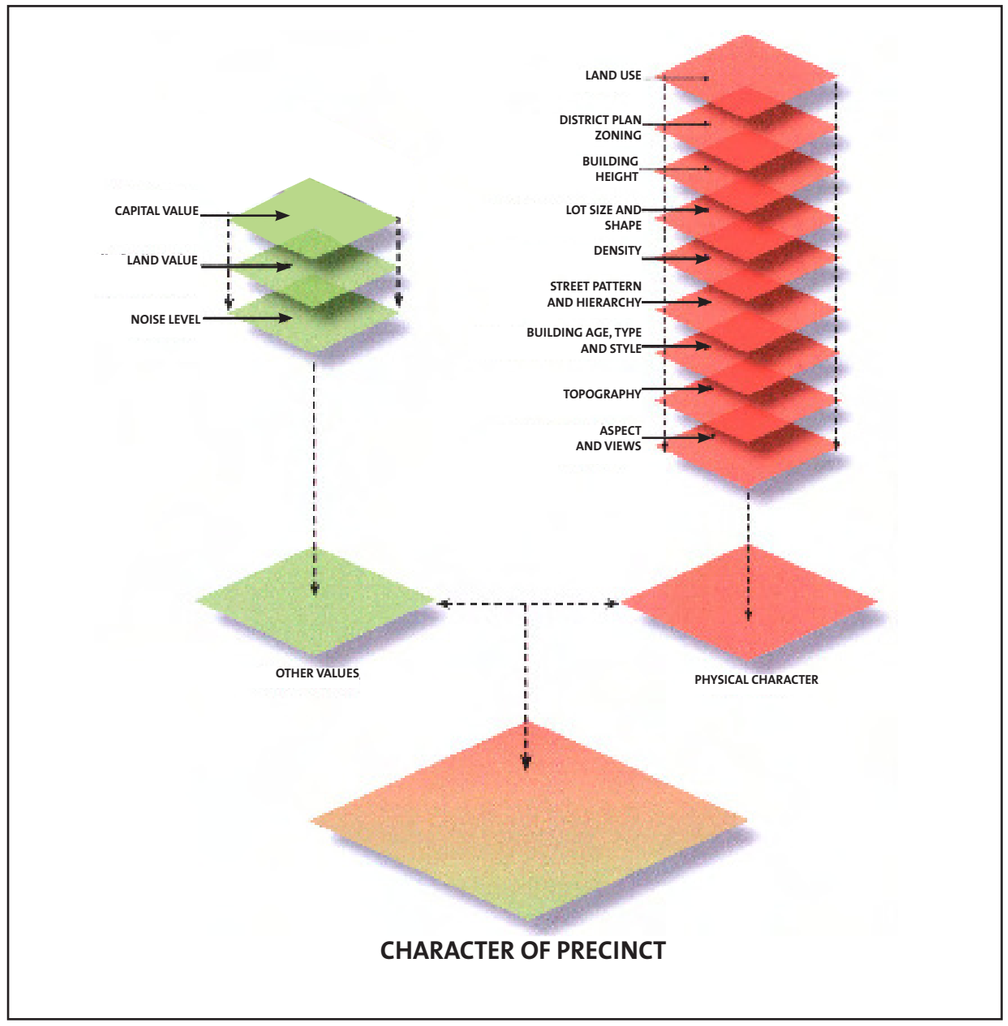


DIAGRAM 2: PROCESS OF DEFINING CHARACTER

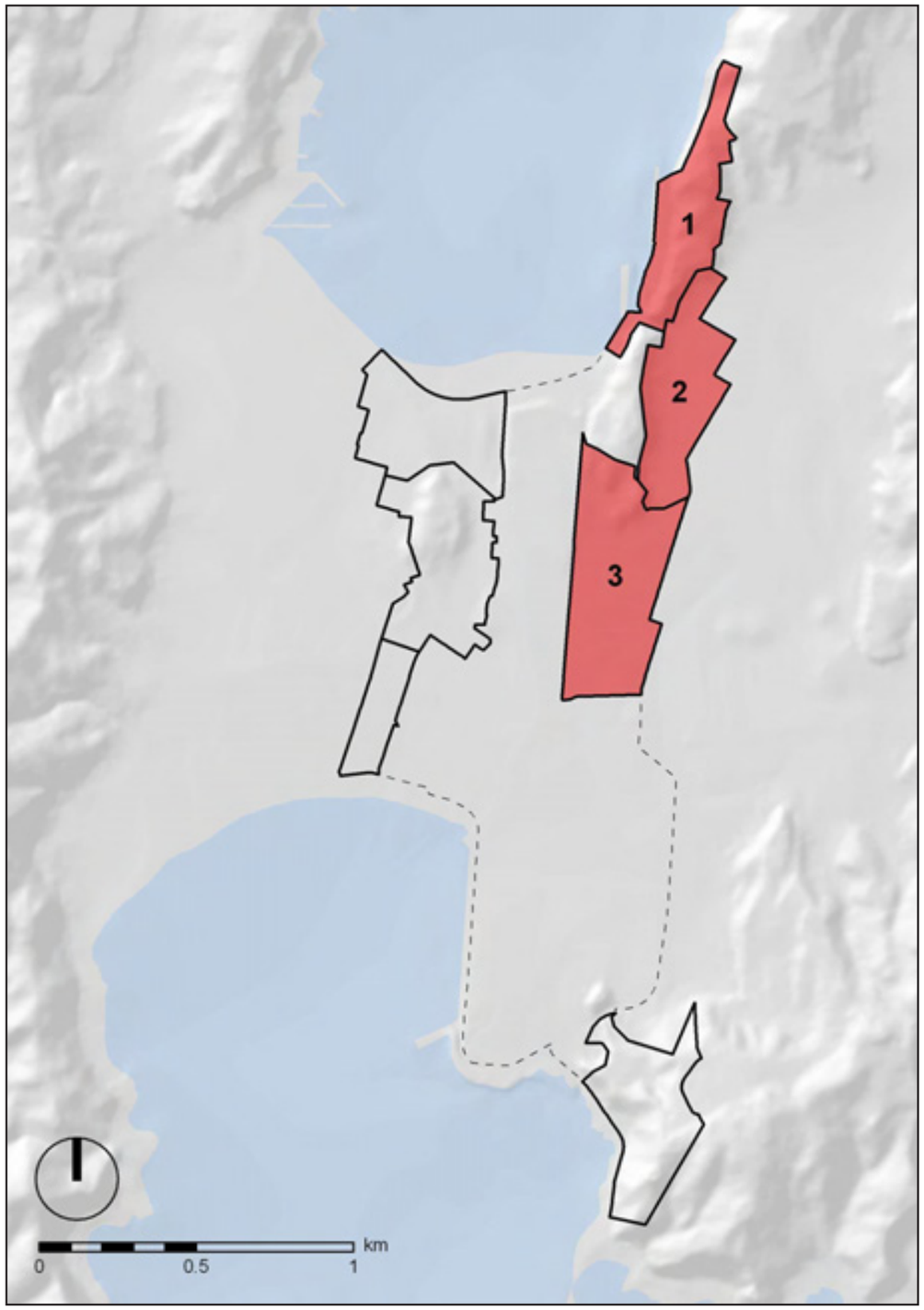
CHARACTER ANALYSIS OF PRECINCTS

The range of characteristics considered includes:

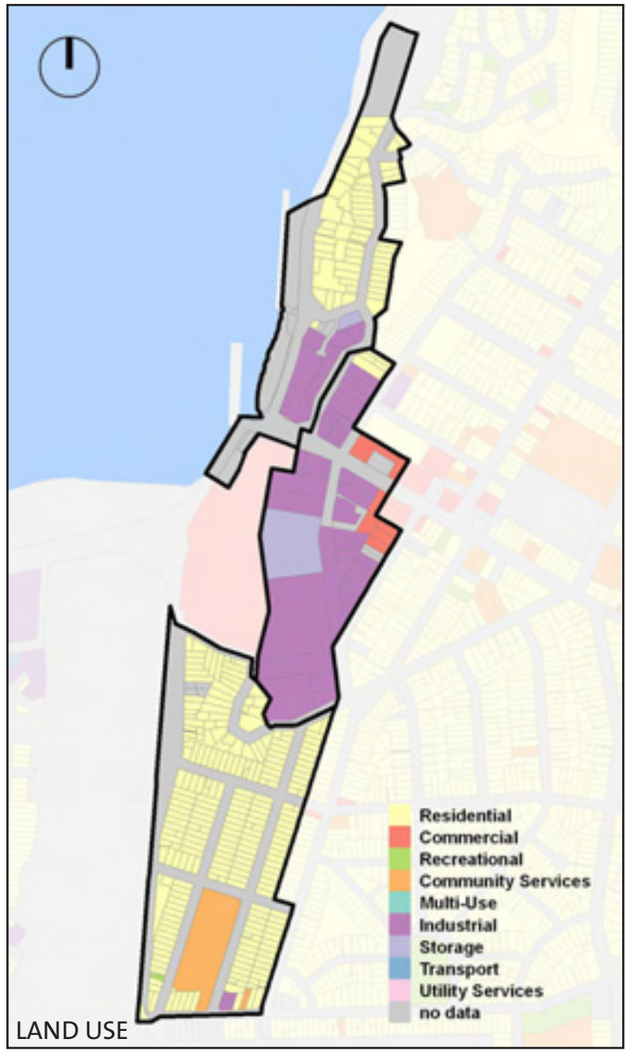
- type of land use
- Wellington City District Plan 'zoning'
- building height
- lot size and shape
- density
- street pattern and hierarchy
- building age, type and style
- topography
- aspect and views
- capital values
- land values
- noise levels.

The combination of different characteristics (refer to Diagram 2) influences the type of land use that may or may not be possible and/or appropriate within the ANB in the future.

The characteristics of the separate precincts are described in the following pages.



PRECINCT 1, 2 & 3



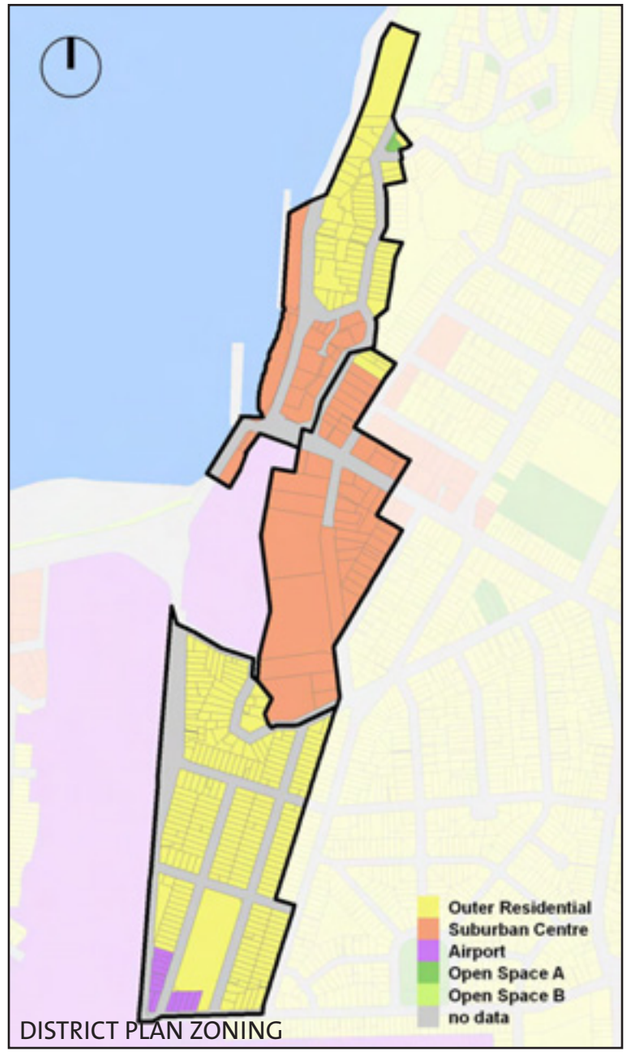
Land Use

Precinct 1 comprises an area of residential land use to the north and an industrial area to the south.

Precinct 2 comprises an area of commercial and industrial land uses including some large land holdings and a small amount of residential land use.

Precinct 3 comprises mostly residential land use (small detached residences) and a community service land use, Miramar South School.

There are some areas where residences and industrial land uses face each other across the street (eg. Southampton and Tauhinu Streets) presenting interface and compatibility issues.



District Plan Zoning

Precinct 1 is predominantly zoned as Outer Residential and Suburban Centre.

Precinct 2 is zoned Suburban Centre and Outer Residential.

Precinct 3 is zoned Outer Residential and Airport.

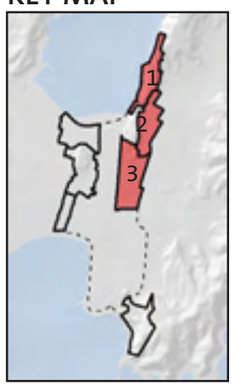
The mix of residential and industrial in Precincts 1 & 2 causes some interface issues.

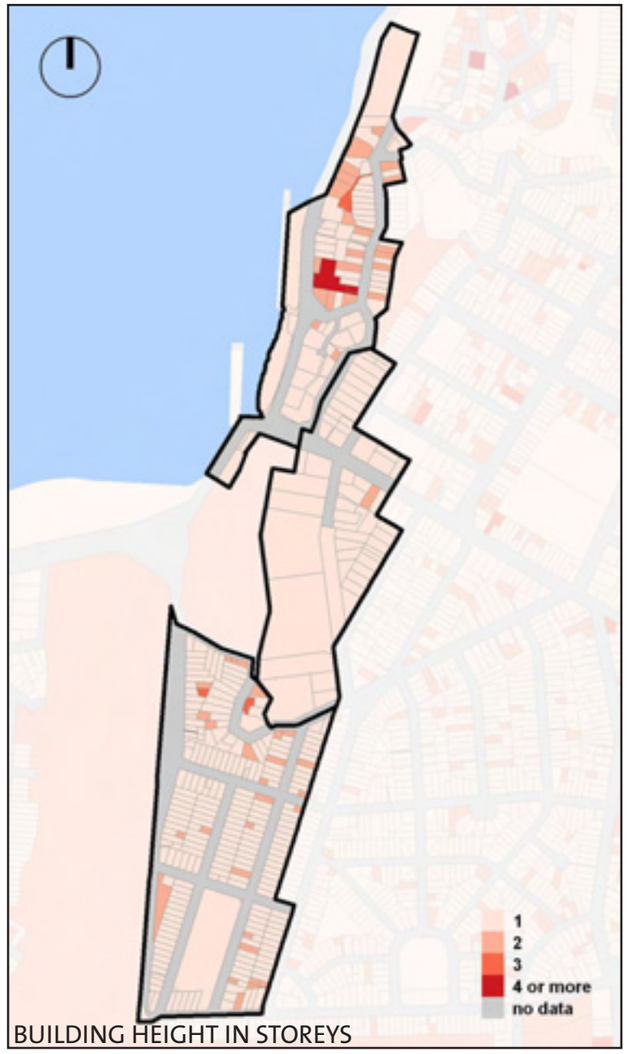
Precinct 2 has commercial land use on Miramar Avenue.

Miramar South School is located in Precinct 3.

Industrial area in Precinct 2.

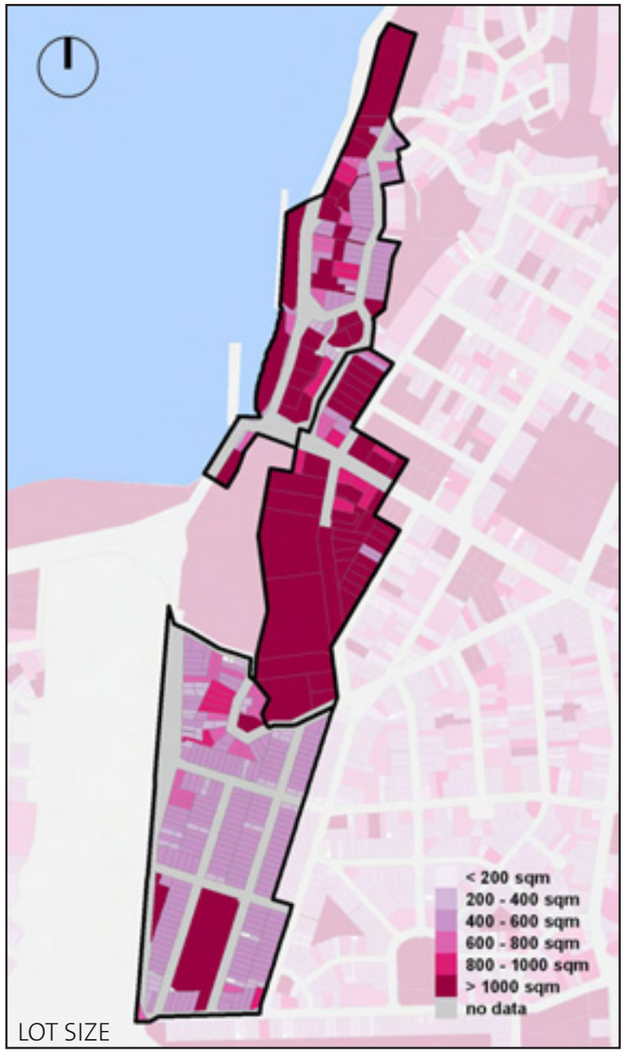
KEY MAP





Building Height

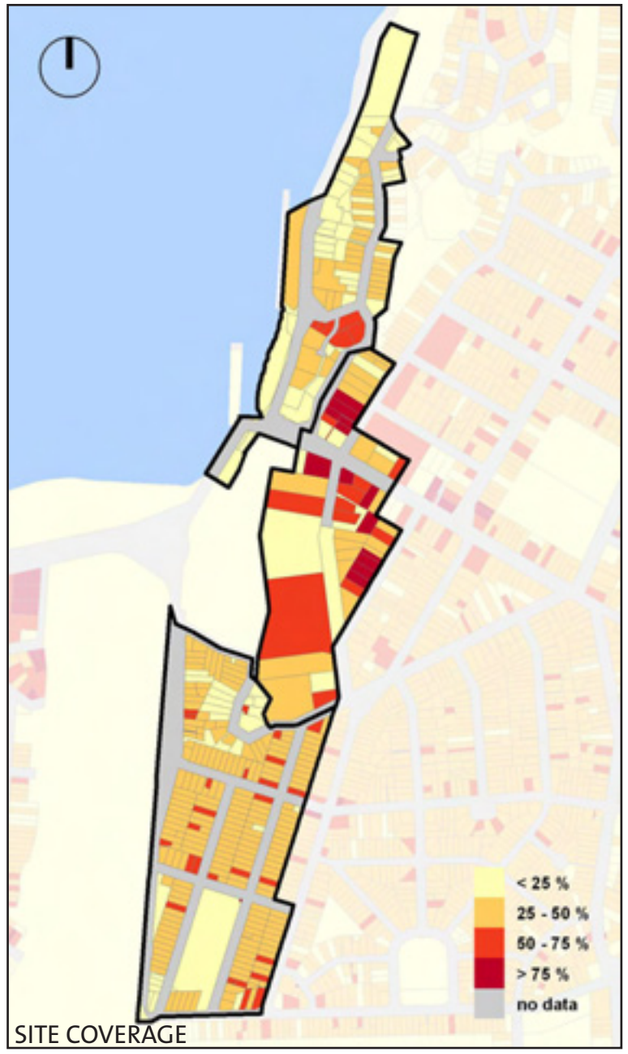
Most buildings are one storey in height. There are a small number of buildings that are two or more storeys in height, including some recent multi-unit developments in Maupuia (Precinct 1). The industrial and commercial buildings in Precinct 2, while mainly one storey, are a greater height than the residences (larger floor to ceiling heights) and of larger scale generally.



Lot Size and Shape

Most residential lots are rectangular in shape. The standard lot size is 12m wide x 40m deep with an east/west orientation. Most lots are 400-600 sqm. The sloping sites in Precinct 1 and 3 are less regular in shape.

Industrial/commercial lots in Precinct 1 and 2 are mostly large (>1000 sqm) and irregular in shape. The industrial lots in Precinct 2 are large and rectangular in shape.

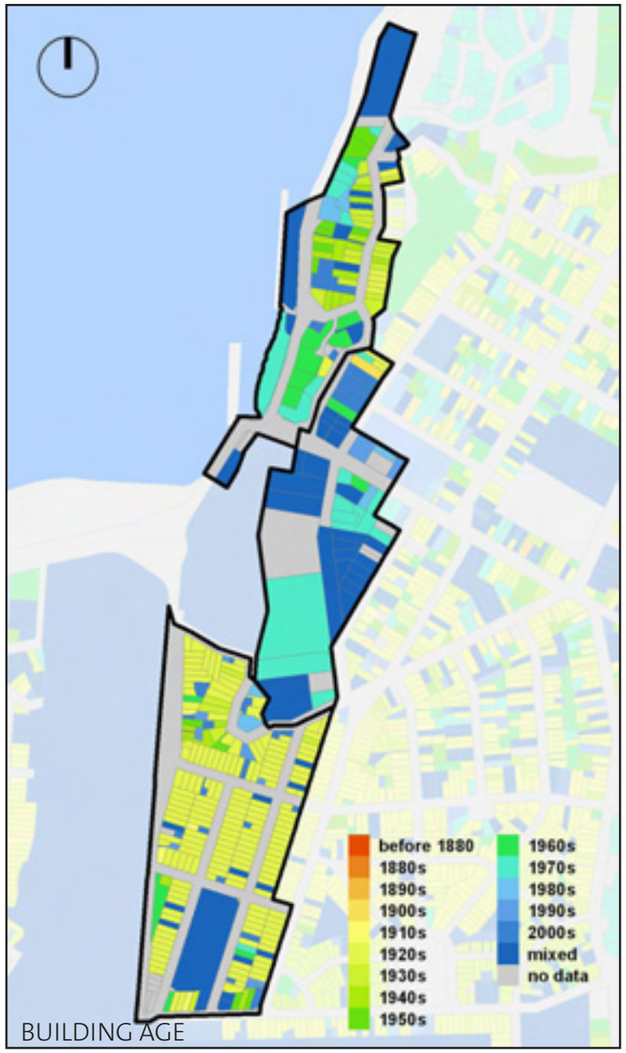


Density

Site coverage varies from less than 25% to greater than 75% with most residential lots in the range of 25-50%. Most industrial/commercial lots have greater than 50% site coverage. This is relatively high site coverage compared to Wellington as a whole. Site coverage is generally higher in the flat areas of the precincts.

Buildings are predominantly aligned to the street. Residences are located in the front half of the lot with 6-8m the average setback from the front boundary. Industrial buildings in the Precincts generally have no or minimal setback.

STREET PATTERN AND BUILDING FOOTPRINTS



BUILDING AGE

Street Pattern and Hierarchy

The street pattern responds to the topography with a grid street pattern in the flat areas of Precinct 2 and 3 and curved streets in Precinct 1. The main streets run in a north-south direction. A pedestrian underpass (under the airport) connects Coutts Street with Miro Street in Miramar. While some streets have a strictly residential character, others such as Maupuia, Tauninu and Stone Street have a mixed industrial/residential character, causing some compatibility issues. The airport forms a strong edge restraining movement to the west of the precincts.

Blocks are long (more than 400m) which is not good for ease of movement within a residential area (a block length of 90-120m is desirable as it provides increased directional choice).

Building Age, Type and Style

Buildings range in age from the 1900s to recent (post 2000s) buildings. The majority of houses were built in the 1920s (prior to the airport) in the bungalow style. The consistency of residence age and style and lack of modification to structures provides a consistent built form character to residential streets. The industrial buildings in Precinct 1 and 2 are all post 1960s and mixed in ages.

While building condition varies form poor to good, most residences have been maintained and have a good overall condition.

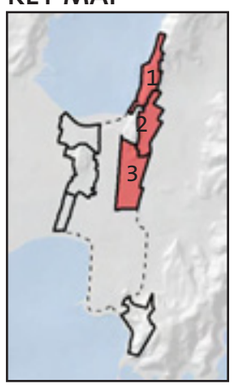
The majority of houses were built in the 1920s in the bungalow style.

A slip road off Calabar Drive provides access to residential properties.

Street trees are common in the streets in Precinct 3 and improve the street appearance.

The pedestrian underpass connecting Coutts Street, Rongotai to Miro Street, Miramar.

KEY MAP

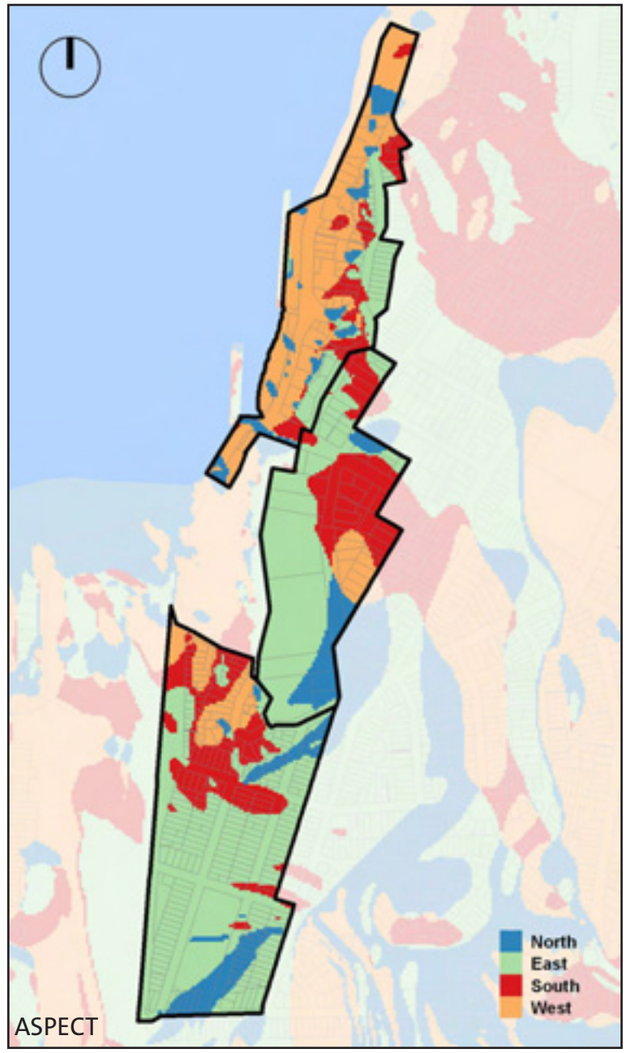


Topography

Precinct 1 has a steep slope facing Evans Bay with development at the top and bottom of the escarpment.

The Wexford hill west of Precinct 2 creates a natural visual barrier between Miramar and the Airport, screening the airport from this area of the city. The hill also creates a green backdrop, contrasting with the sparsely vegetated streets on the flat areas surrounding it.

The development pattern in the area north of Caledonia Street in Precinct 3 responds to the sloping topography. The berm alongside Wexford Street provides some separation from the airport/Calabar Drive and residences, but looks of low visual amenity.



Aspect and Views

The hill in Maupuia provides different aspects and views for buildings located in Precinct 1. Houses located on the slope facing Evans Bay have a western aspect.

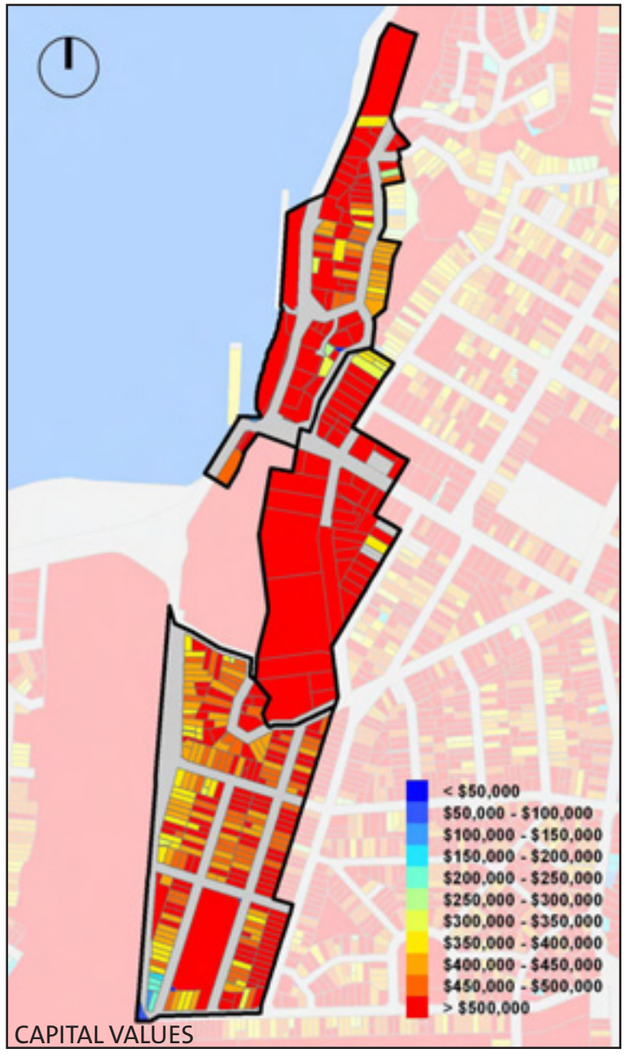
New apartments in Maupuia optimise the views over Evans Bay.

The topography of Precinct 1 makes buildings highly visible across Evans Bay.

The hill in Maupuia offers the amenity of views.

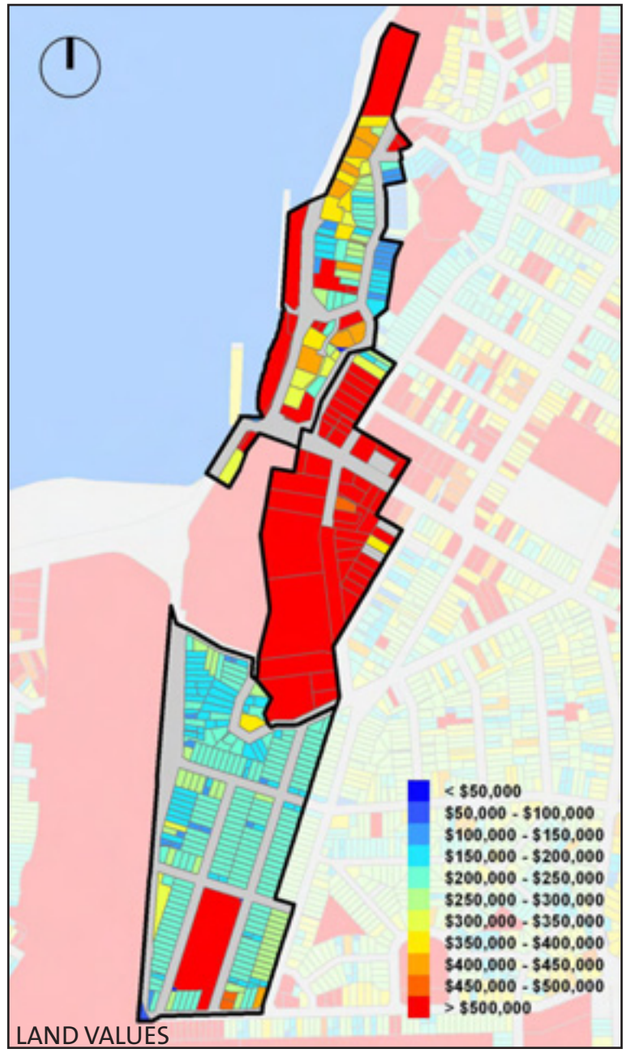
A berm alongside Wexford Street screens the airport and Calabar Drive from residences.

KEY MAP



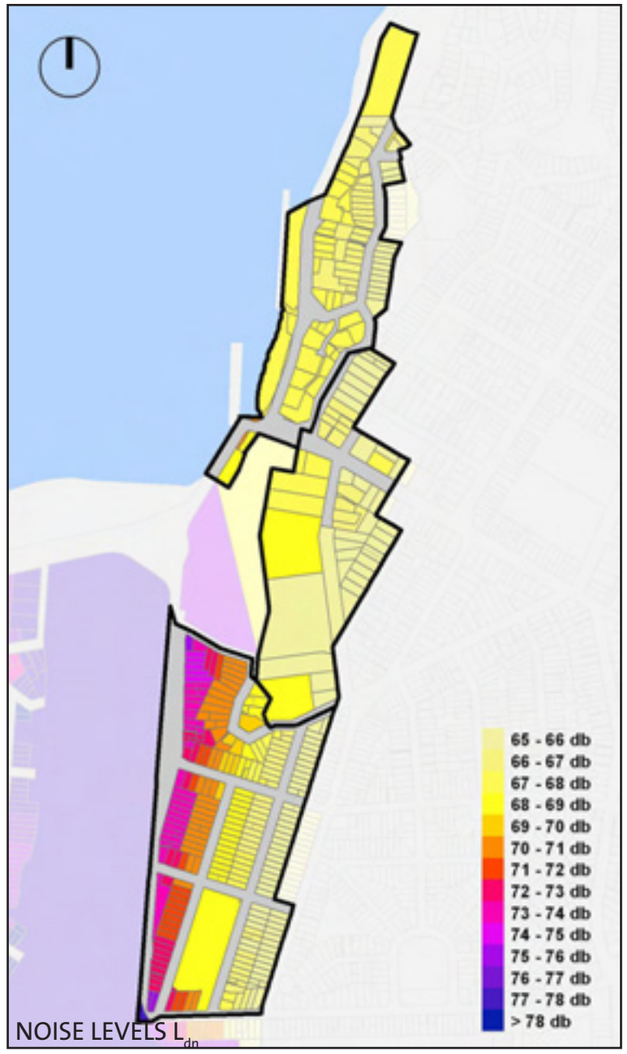
Capital Values

Capital values in Precinct 1,2 and 3 are mostly in the range of $400,000 to $500,000 or more. Capital values are slightly lower in the area closer to the airport which correlates with where noise levels are higher (western side of Precinct 3).



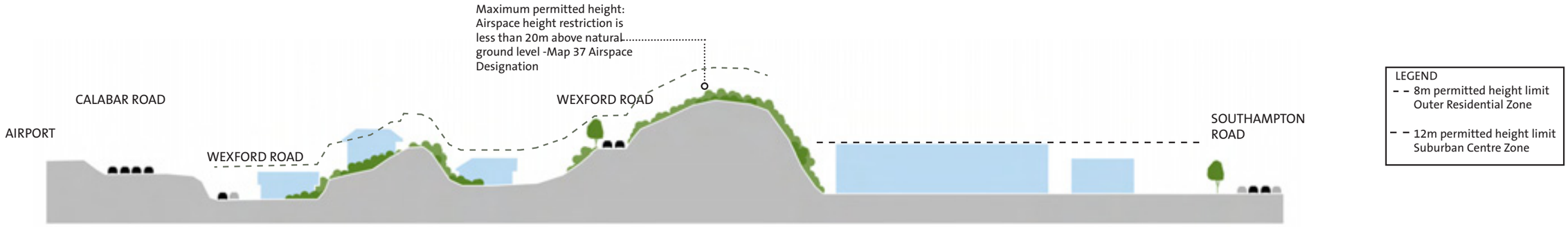
Land Values

Land values in Precinct 1 and 3 are mostly in the range of $100,000 to $300,000. Land values in Precinct 2 are mostly over $500,000. Land values are relatively evenly spread across the Precinct regardless of proximity to airport, noise level, aspect or views. The area to the west of Precinct 3 (close to the airport) has slightly lower values, as does the area to the east of Precinct 1 (perhaps due to the aspect).

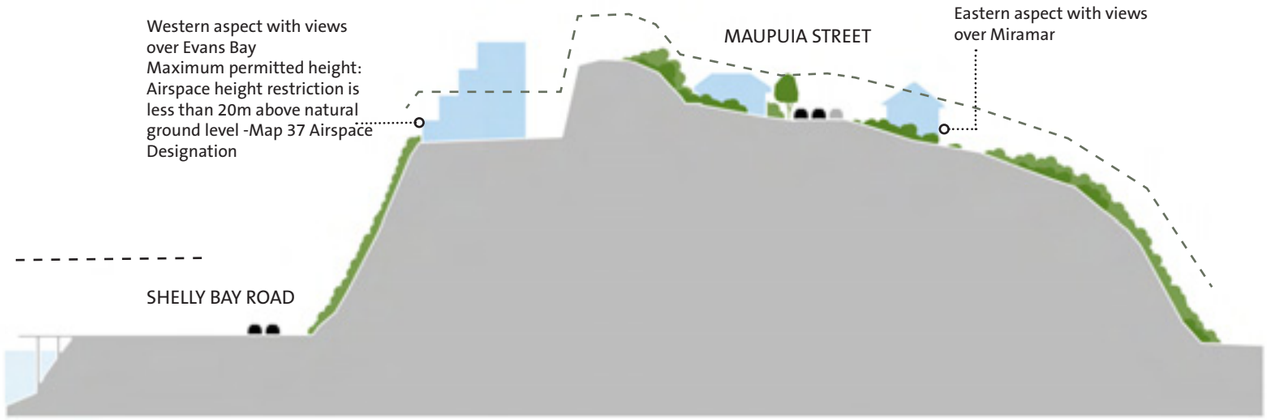


Noise Levels

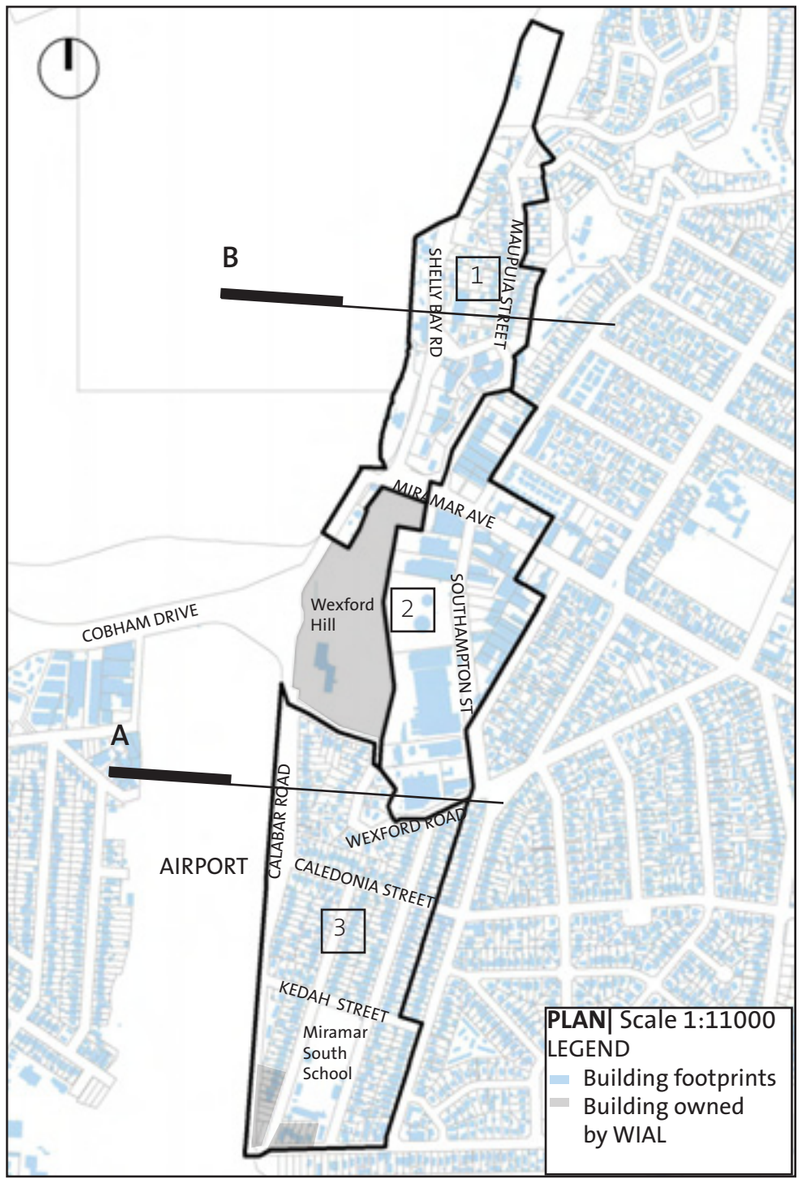
Noise levels range from L_{dn} 65-78 dB. The highest noise levels are received on Calabar Drive. Noise levels are lowest on the eastern side of the precincts.



SECTION A| Scale 1:1000



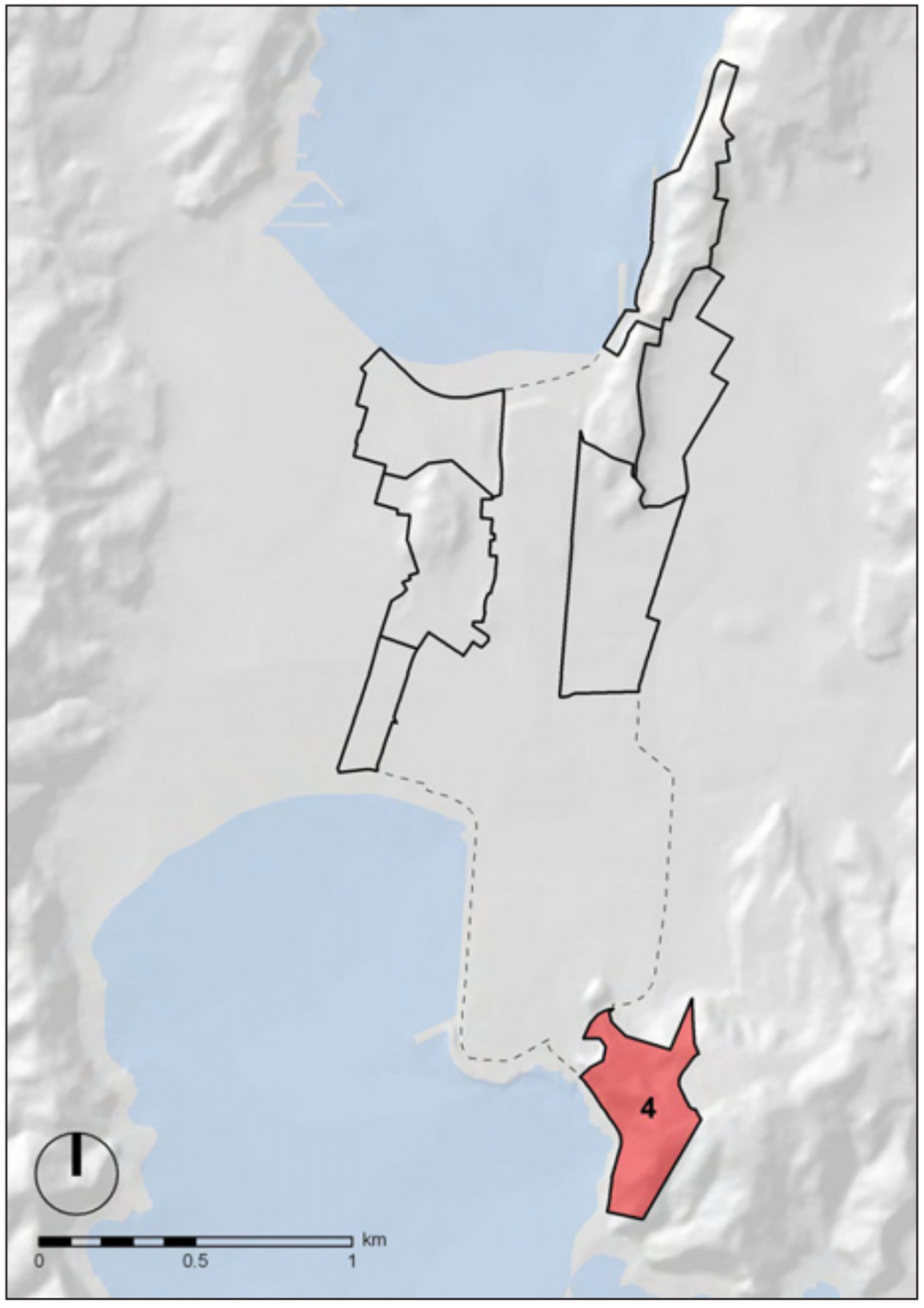
SECTION B| Scale 1:1000



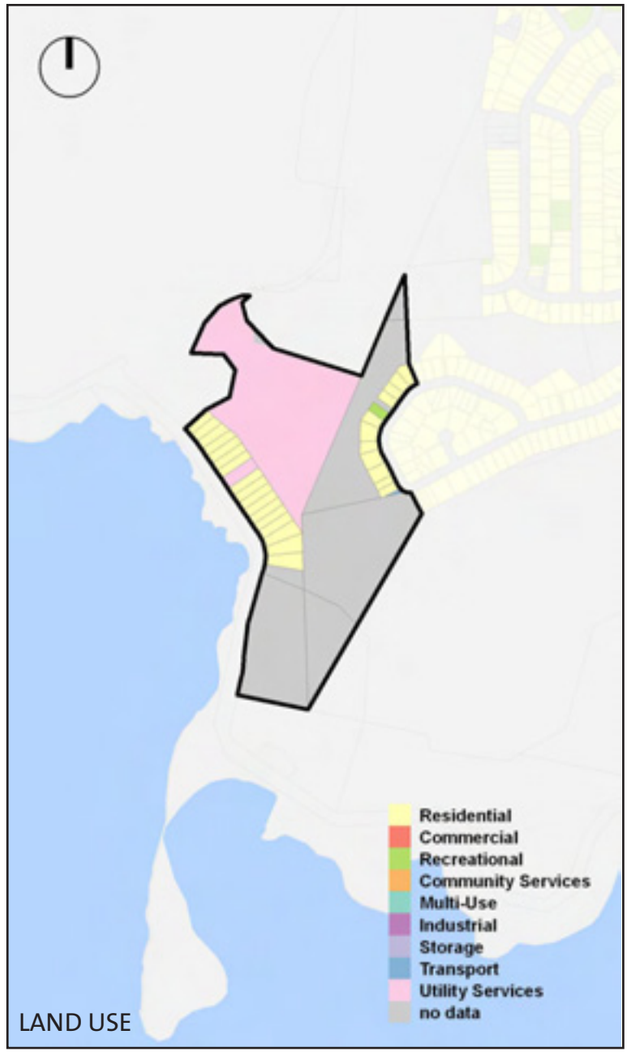
PRECINCT 1, 2, & 3 SUMMARY

Precinct 1,2 and 3 are located on the east side of the airport.

- Land use is a mix of residential, industrial and some commercial (suburban centre zone) in Precincts 1 and 2 and mostly residential in Precinct 3 (outer residential zone).
- Most residential lots are rectangular in shape and 400-600 sqm and relatively intensively used especially in Precinct 3.
- Residential properties closest to Calabar Road are impacted by high noises levels and the adjacency of the busy road - the Miramar South School is also a noise sensitive activity within Precinct 3
- Industrial/commercial lots in Precinct 1 and 2 are mostly large (>1000 sqm) and irregular in shape. The industrial lots in Precinct 2 are large and rectangular in shape -the larger lots suggest some flexibility as to future uses
- Site coverage varies from less than 25% to greater than 75% with tenancies to less coverage of the industrial and steeper sites.
- The street pattern responds to the topography with a grid street pattern in the flat areas of Precinct 2 and 3 and curved streets in Precinct 1.
- Buildings range in age from the 1900s to recent (post 2000s) buildings. The majority of houses were built in the 1920s (prior to the airport) in the bungalow style and are unlikely to be well insulated
- The industrial buildings in Precinct 1 and 2 are all post 1960s and mixed in ages - there are some signs of redevelopment including residential apartments.
- Precinct 1 has a steep slope facing Evans Bay with a good aspect to the west and views - there is development at the top and bottom of the escarpment.
- The hill in Precinct 2 creates a natural visual barrier between Miramar and the airport.
- Capital values in Precinct 1,2 and 3 are mostly in the range of $400,000 to $500,000 or more.
- Land values in Precinct 1 and 3 are mostly in the range of $100,000 to $300,000. Land values in Precinct 2 are mostly over $500,000.
- Noise levels range from L_{dn} 65-78 dB. The highest noise levels are received on Calabar Drive. Noise levels are lowest on the eastern side of the precincts.



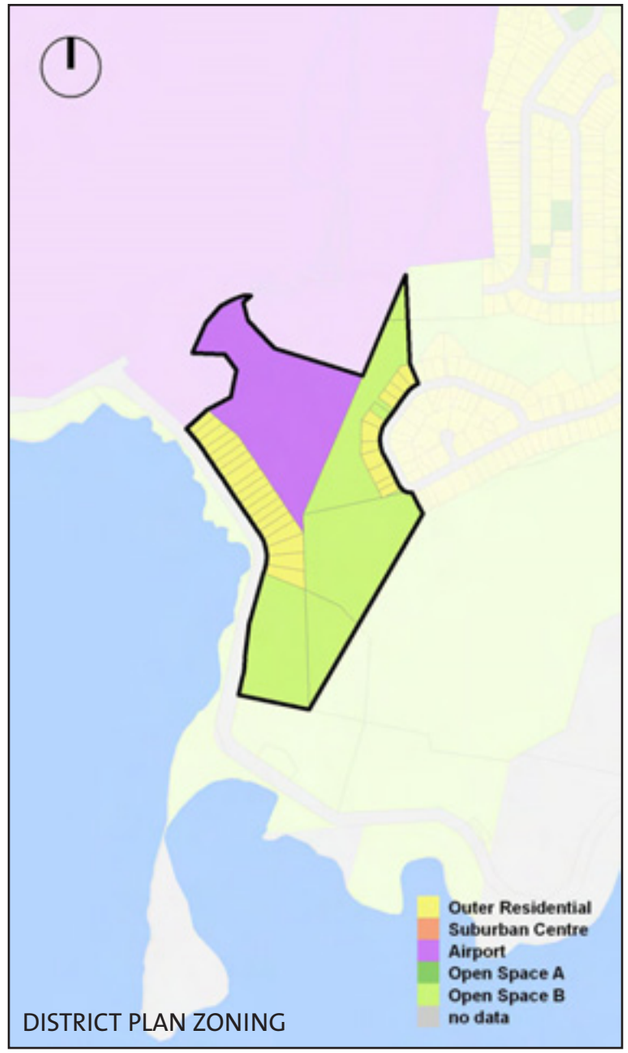
PRECINCT 4



Land Use

The largest land use in Precinct 4 is open space in the form of steep escarpments with sparse significant vegetation, dominated by rank grass and weed species and one group of pine trees. Moa Point comprises predominantly small scale detached residences along the coastal road. Kekeranga Street in Strathmore Park is predominantly state house style houses and a mix of one and two storey attached multi-units. Within the ANB many of the houses are privately owned.

The other major land use is the wastewater treatment plant, accessed via Stewart Duff Drive. The open space and topography assist to visually separate the treatment plant from residential areas.



District Plan Zoning

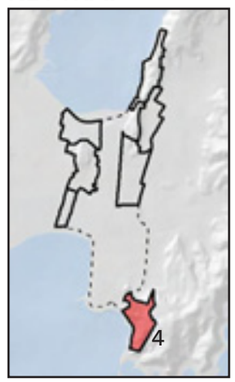
Precinct 4 is zoned under the operative Wellington City Council District Plan as Outer Residential, Airport and Open Space B.

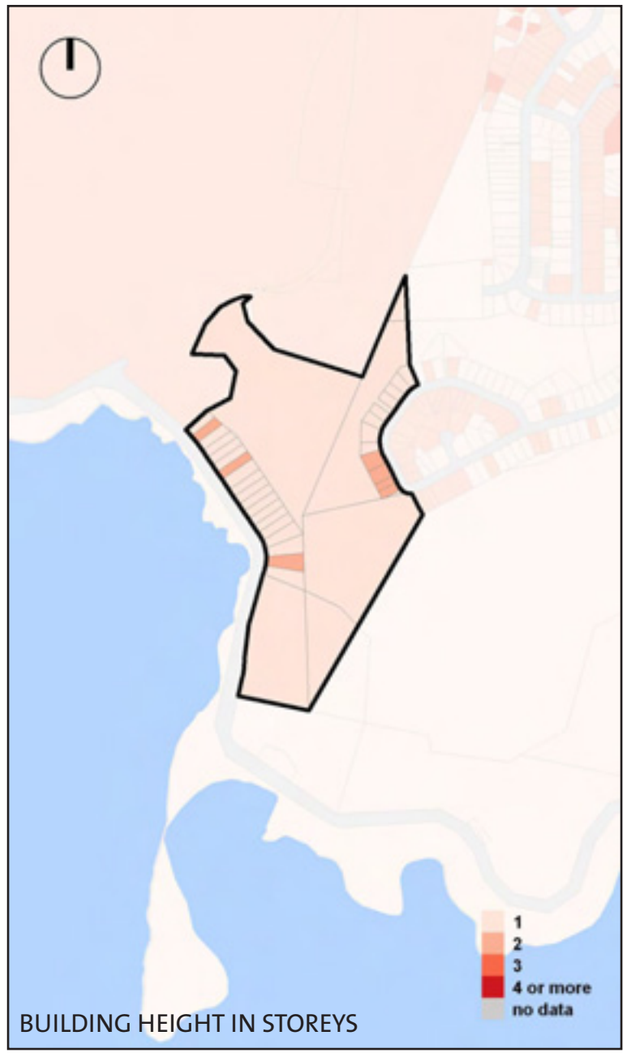
The main land use in Moa Point is residential.

The waste water treatment plant limits the surrounding development options.

The large area of undeveloped open space accentuates the wild, remote character of Moa Point.

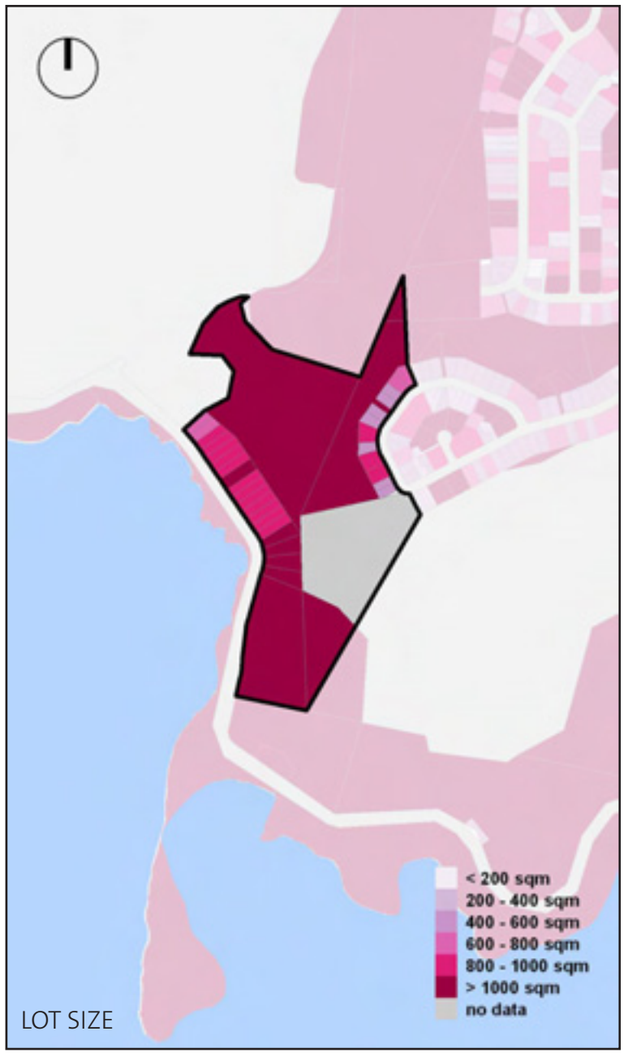
KEY MAP





Building Height

Most buildings are one storey in height. There are no buildings of more than two storeys in the precinct although the scale of some buildings such as the wastewater plant is significantly larger than the residential buildings in the area.

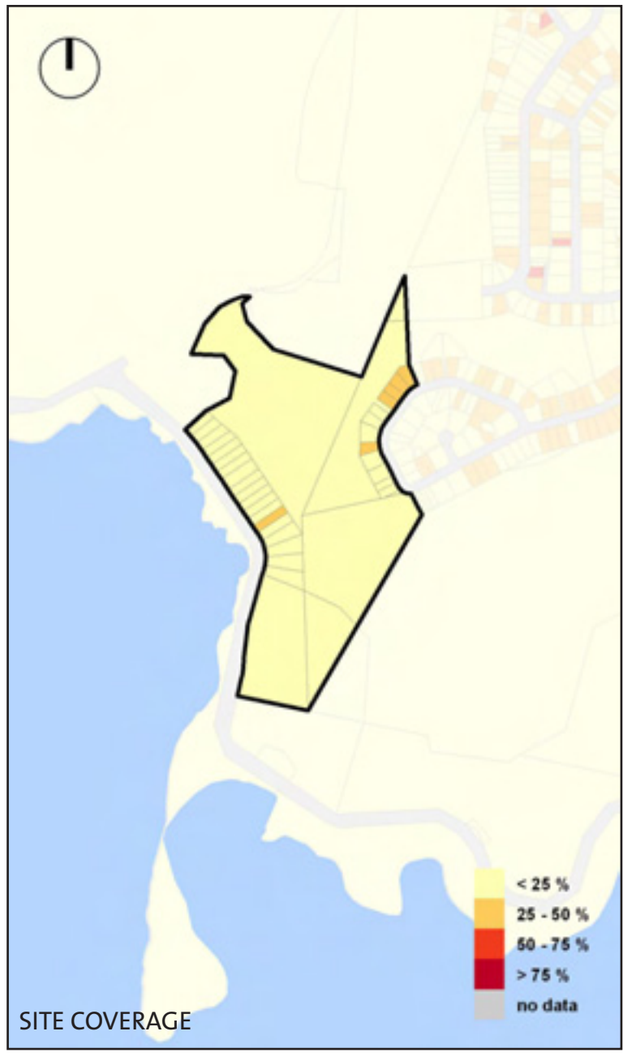


Lot Size and Shape

Most residential lots are rectangular in shape. Where Kekeranga Street curves, lots are less regular in shape.

The standard lot size is 14m wide x 60m deep in Moa Point and 15m wide x 34m deep in Strathmore Park. Most residential lots are 400-1000 sqm in area.

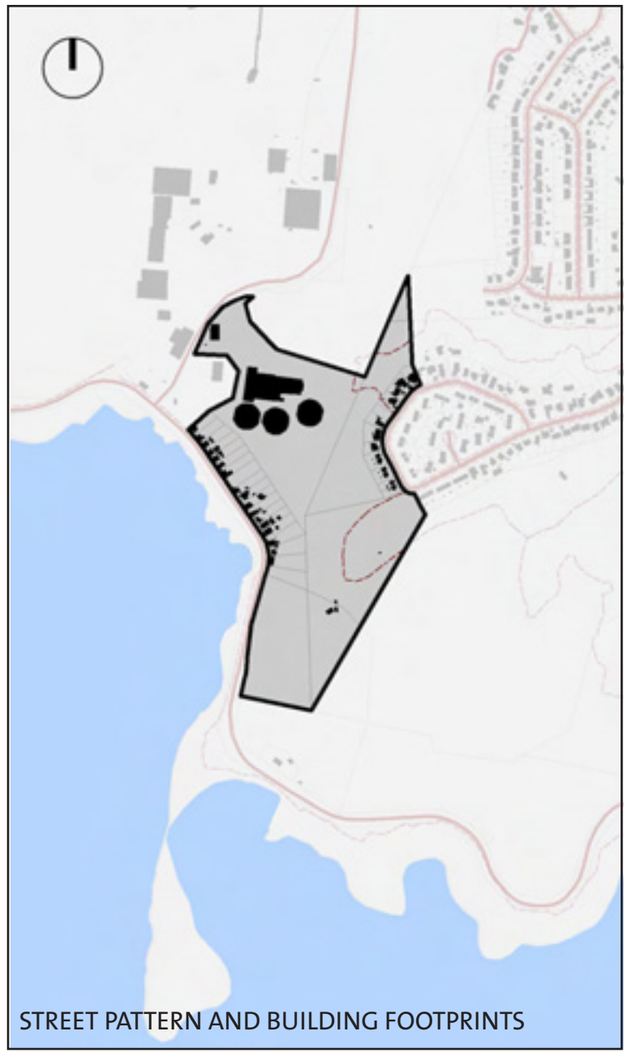
The wastewater treatment plant and open space reserve are irregular in shape and greater than 1000 sqm in area.

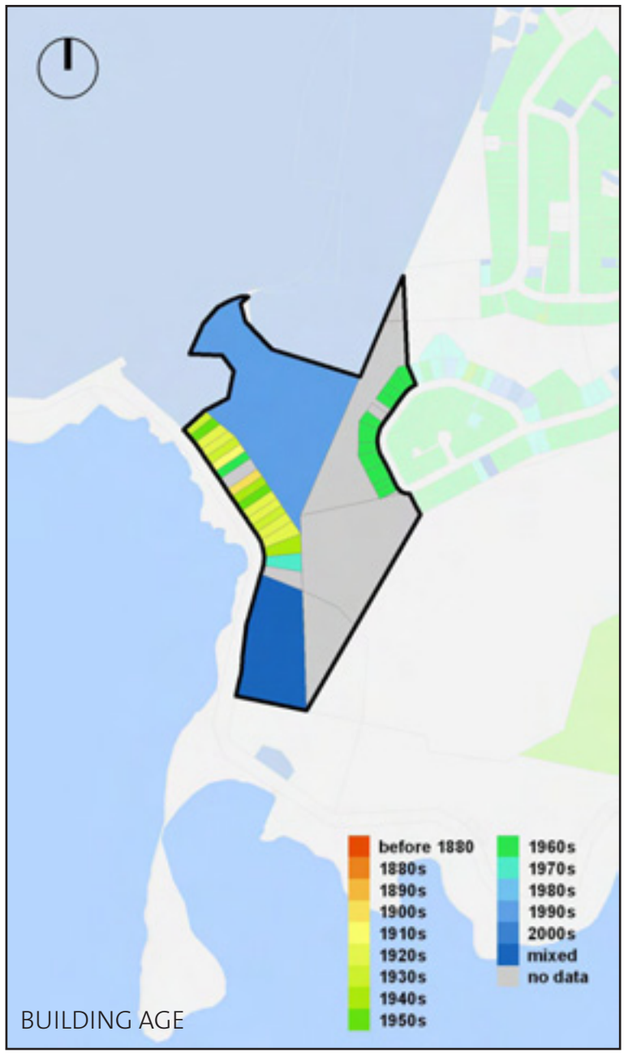


Density

Site coverage is predominantly less than 25%. This is relatively low site coverage compared to Wellington as a whole and gives the precinct an undeveloped character.

Buildings are predominantly aligned to the street and located in the front half of the lot with minimal (less than 5m) setback in Moa Point and 6-8m setback from the front boundary in Strathmore Park.





Street Pattern and Hierarchy

Moa Point Road follows the line of the coastal edge. Kekeranga Street has a distinct curved pattern. Stewart Duff Drive provides a rear entrance to the airport. It has an industrial/commercial character and lacks legibility or definition as an entrance/gateway to the airport.

The airport forms a strong edge to the west and north of Moa Point and the reserve forms a strong edge to the south and east, creating a sense of isolation.

Building Age, Type and Style

Housing age is mixed at Moa Point with houses built from the 1920s onwards. There is more consistency to the houses on Kekerenga Street which were built in the 1960s in the recognisable state housing styles of the time.

While building condition varies from poor to good, most residences have been maintained and have a good overall condition.

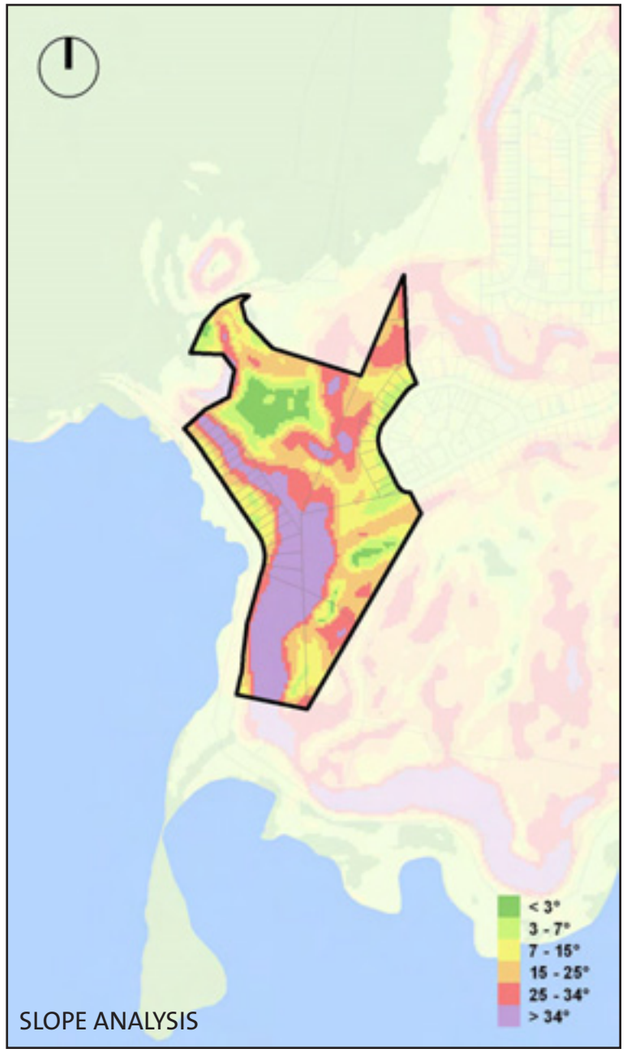
Most buildings are in original condition with little modification evident.

Moa Point Road has a quiet, wild character.

Some of the houses in Kekerenga Street have an identifiable state house style.

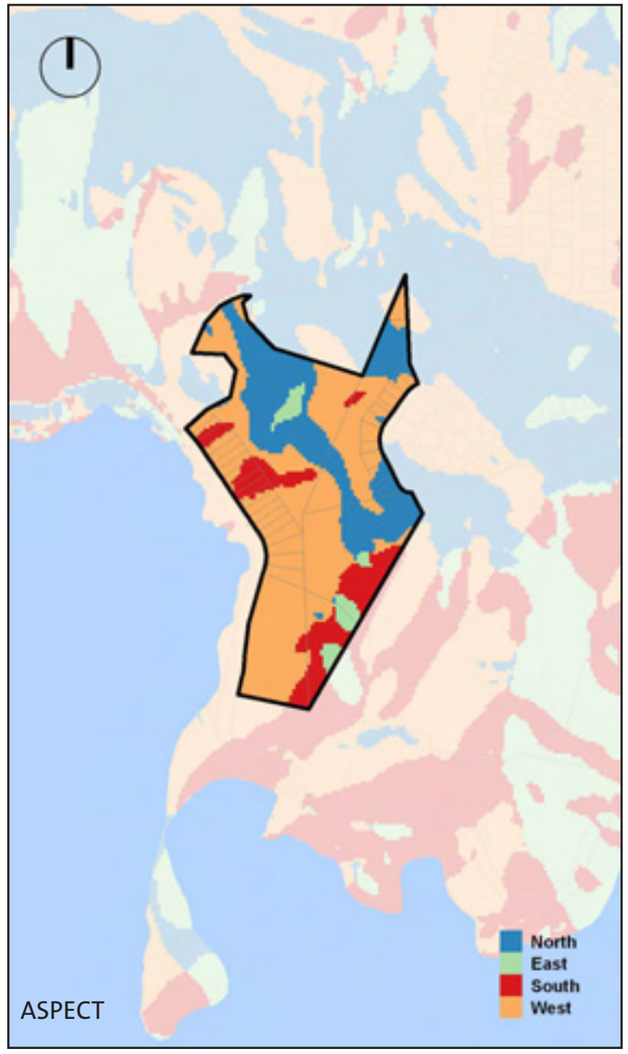
The southern end of Stewart Duff Drive provides the rear access to the airport and has an industrial character.

KEY MAP



Topography

The topography of Precinct 4 has influenced the patterns of development with housing restricted to the ridge top (Strathmore Park) and coastal platform (Moa Point) with the steep coastal escarpment and hills remaining undeveloped. The undeveloped slopes provide a strong green character to the area in contrast with the larger scale of the airport and wastewater plant. The topography also limits the access to Kekerenga Street reducing one aspect of its residential amenity.



Aspect and Views

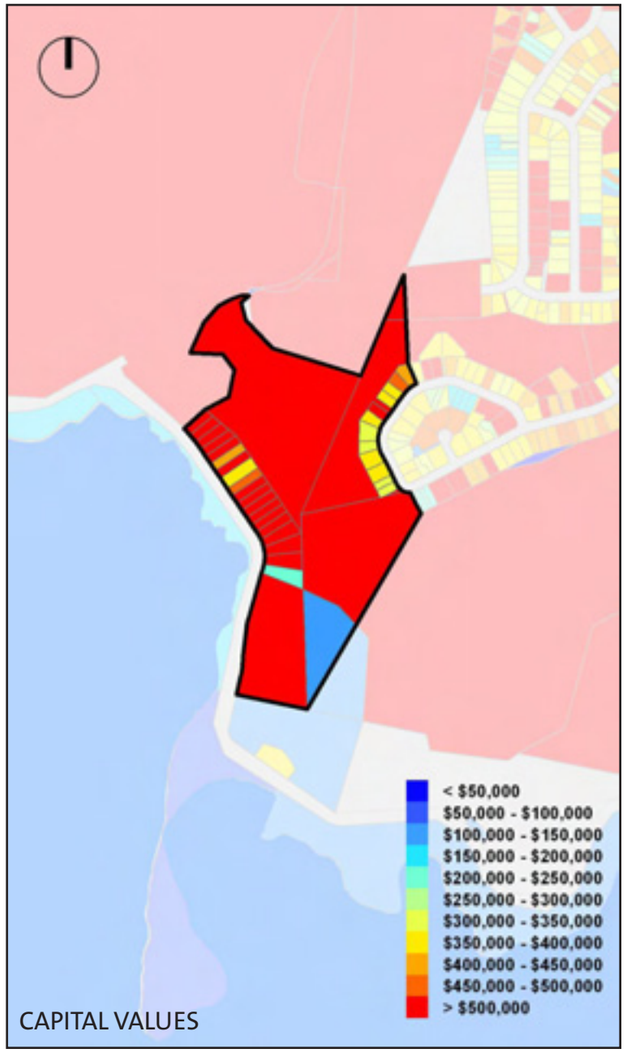
The views and western aspect from Kekeranga Street, Strathmore Park provides visual amenity for residents. Residences on Moa Point Road also have a western aspect and coastal views.

The escarpment behind houses in Moa Point limits development.

The views and western aspect from Kekeranga Street provide amenity for residents.

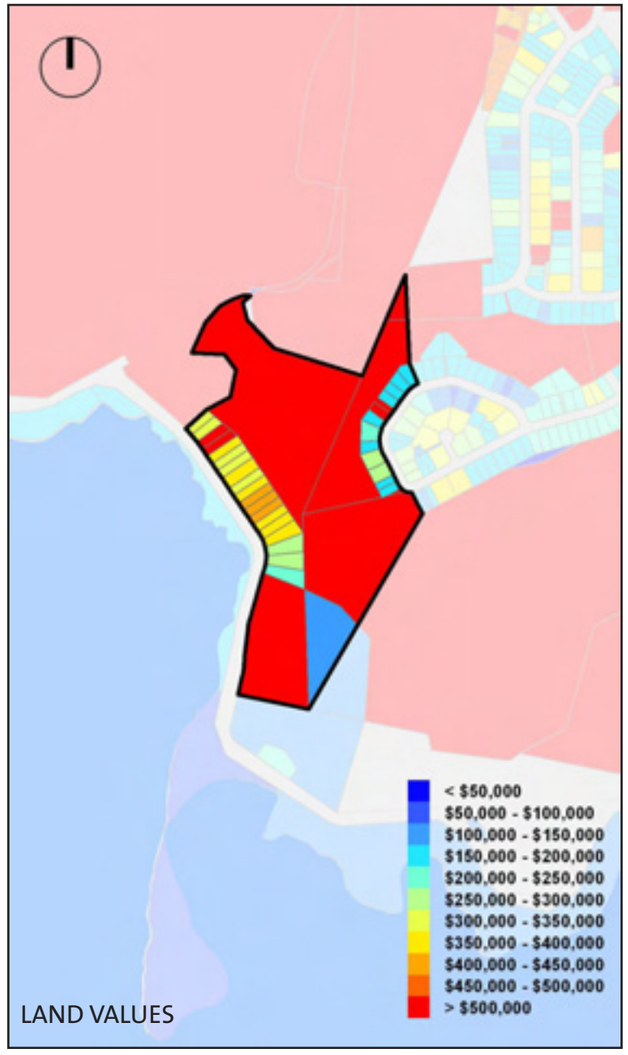
The reserve at the end of Kekerenga Street gives it an open natural feel.

KEY MAP



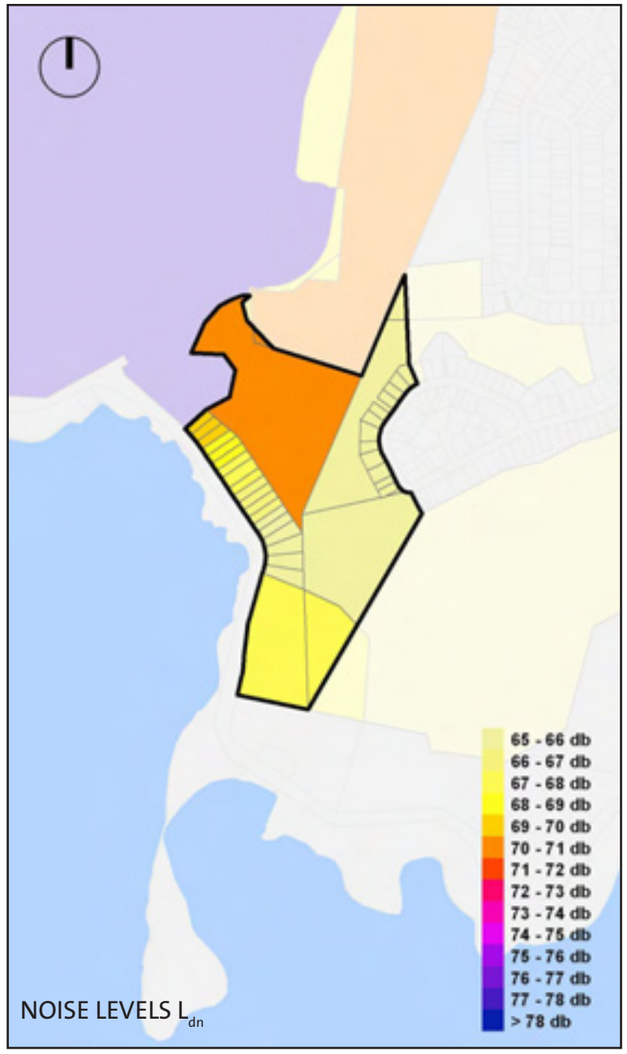
Capital Values

Capital values in Precinct 4 are mostly in the range of $300,000 to greater than $500,000. Capital values appear unrelated to noise levels.



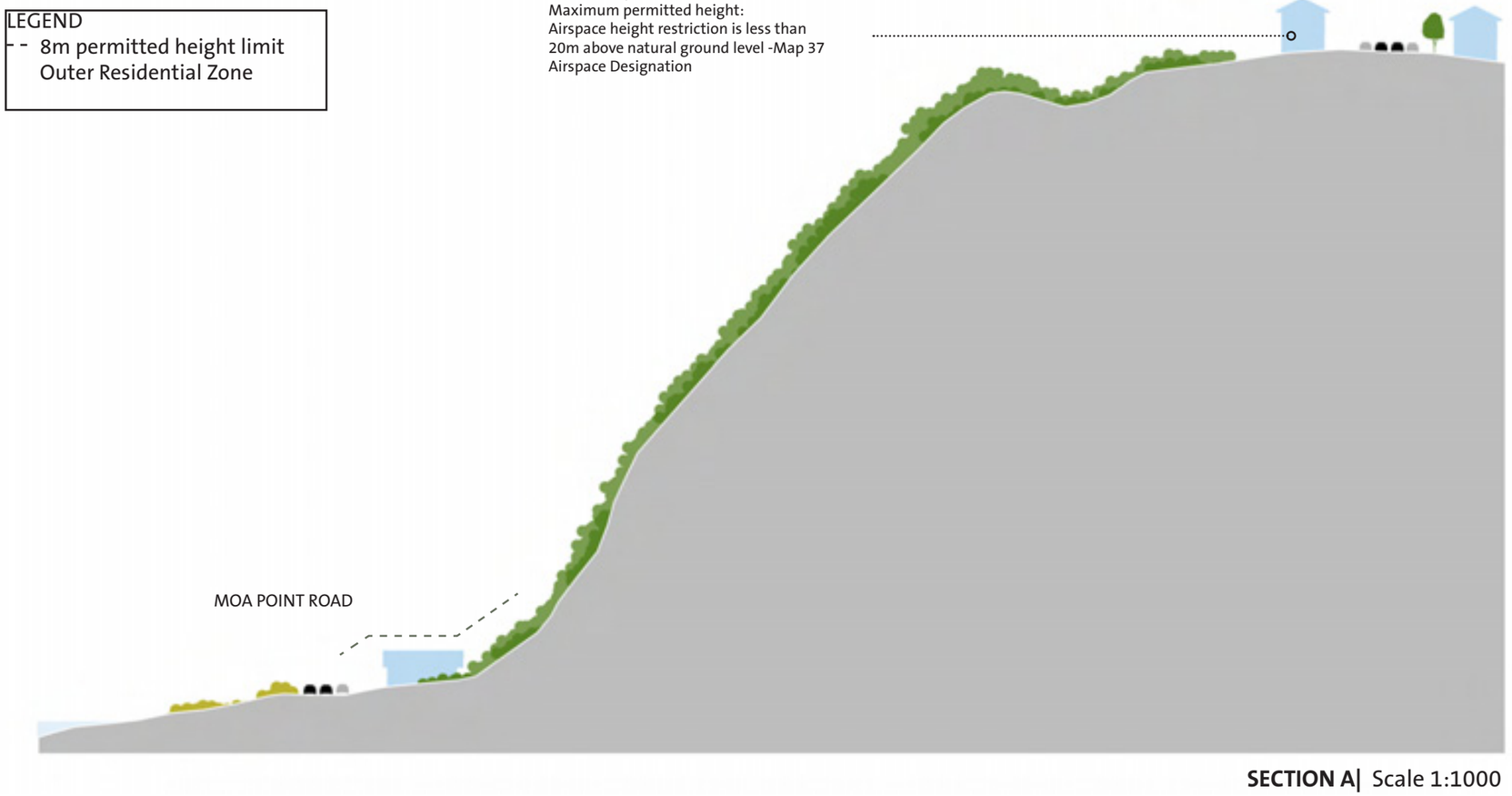
Land Values

Land values in Precinct 4 are mostly in the range of $150,000 to over $500,000. The land values are lowest in Strathmore Park, probably due to the buildings being state housing.

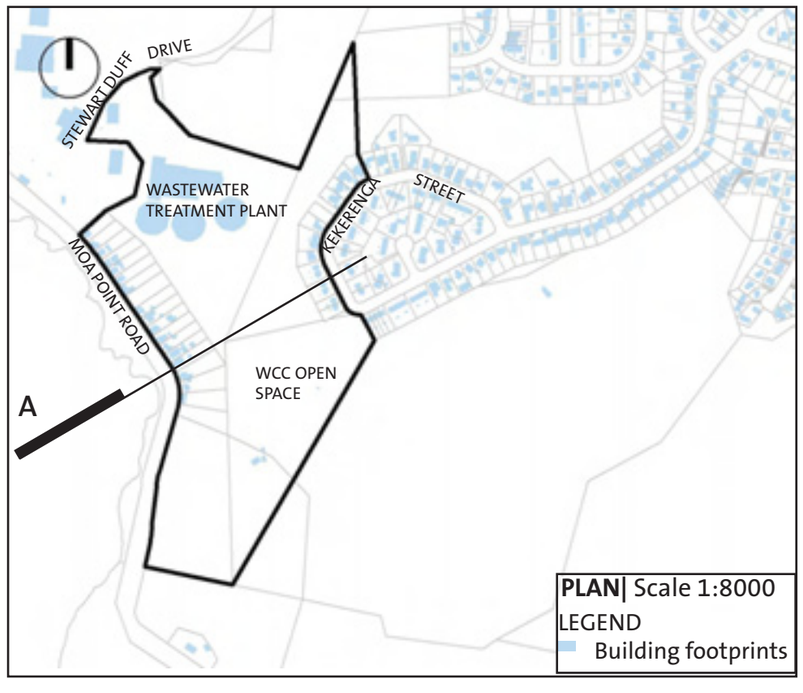


Noise Levels

Noise levels range from L_{dn} 65-71 dB. The highest noise levels are received at the wastewater treatment plant. Noise levels are lower at the southern side of Moa Point and Strathmore Park.



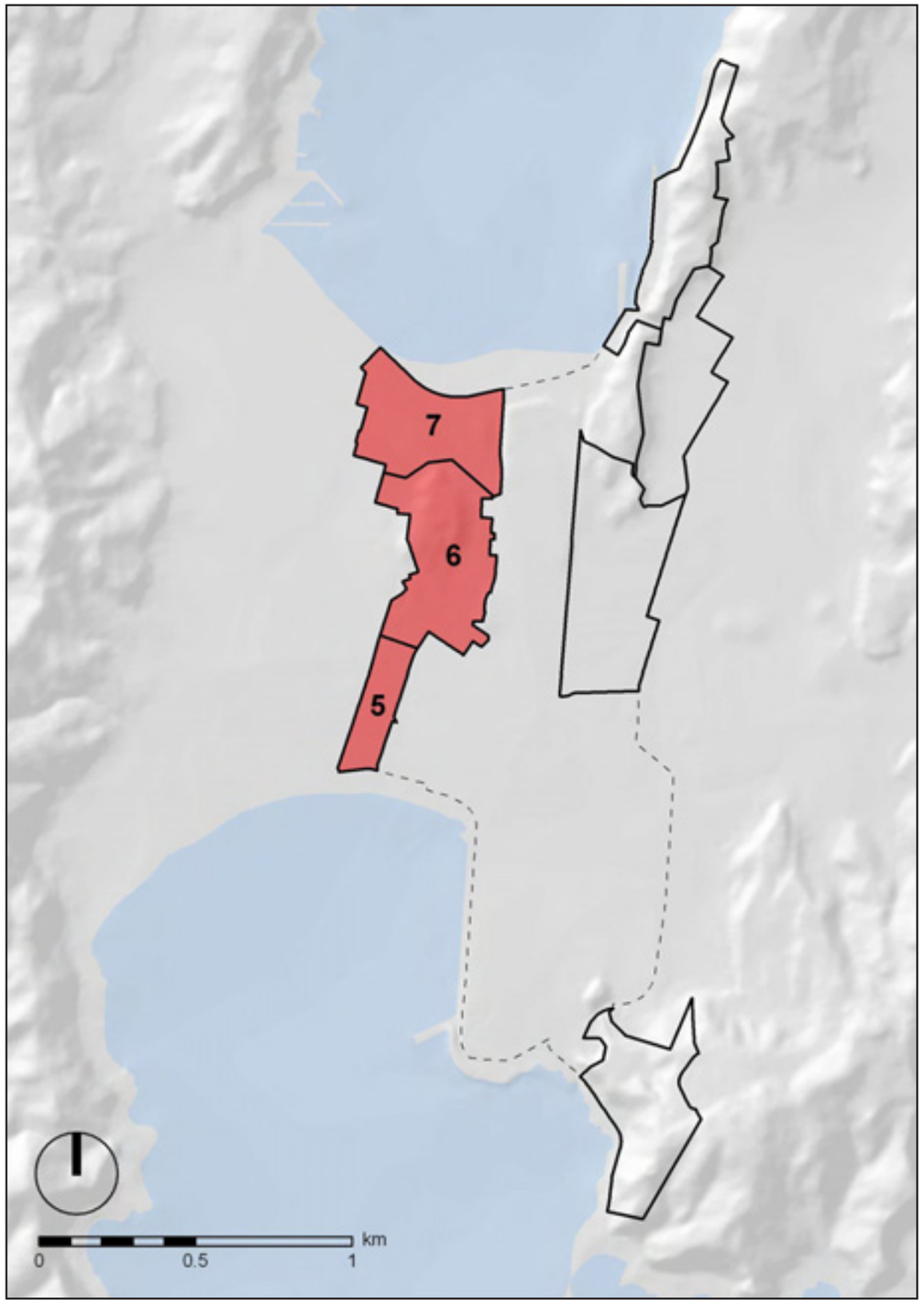
SECTION A| Scale 1:1000



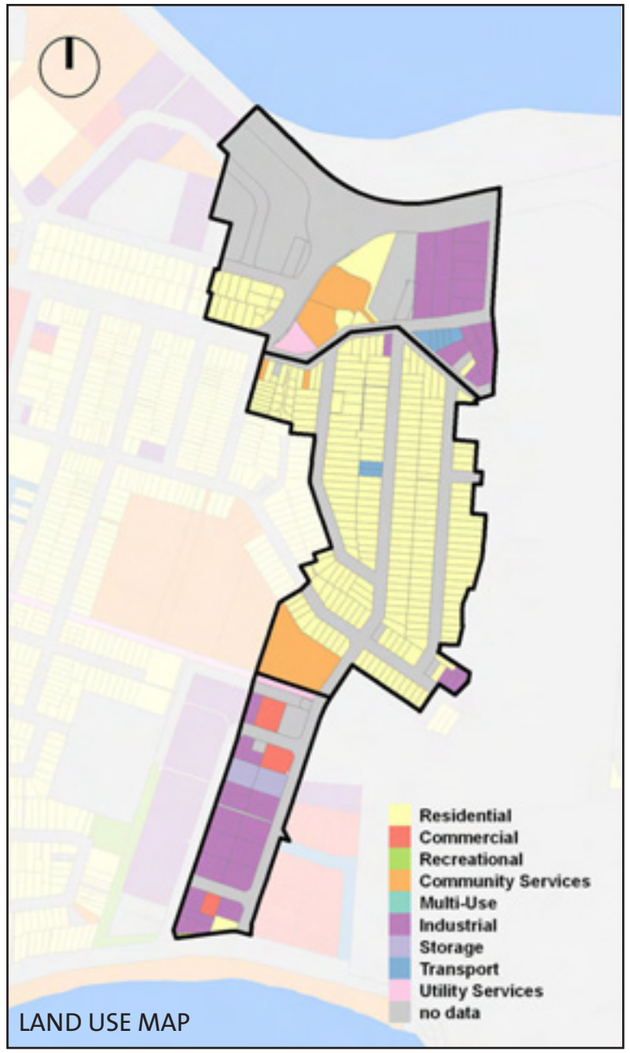
PRECINCT 4 SUMMARY

Precinct 4 is located on the south west side of the airport.

- Land use is industrial, residential and open space and zoned under the operative Wellington City Council District Plan as Outer Residential, Airport and Open Space B. .
- Most residential lots are rectangular in shape and 400-1000 sqm in area, although many larger sites have steep topography which limits future development and site coverage is relatively low (less than 25%)
- The wastewater treatment plant and open space reserve are not particularly noise senstive, although there are effects on open space amenity
- Housing age is mixed at Moa Point with houses built from the 1920s onwards -there are some limited signs of upgrading, but generally the houses are unlikely to be well insulated.
- There is more consistency to the houses on Kekerenga Street which were built in the 1960s in the state house styles.
- The topography of Precinct 4 has influenced the patterns of development with housing restricted to the ridge top (Strathmore Park) and coastal platform (Moa Point) with the steep coastal escarpment and hills remaining undeveloped.
- Capital values in Precinct 4 are mostly in the range of $300,000 to greater than $500,000.
- Land values in Precinct 4 are mostly in the range of $150,000 to over $500,000.
- Noise levels range from L_{dn} 65-71 dB.



PRECINCT 5, 6 & 7

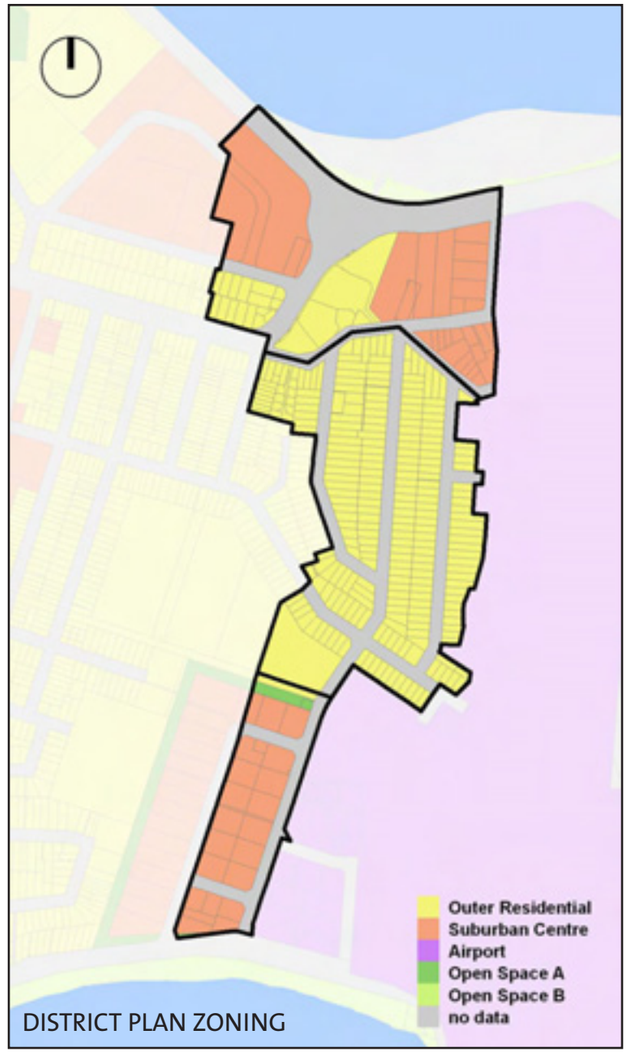


Land Use

Precinct 5 and 7 have industrial/ big box retail uses with a small amount of residential. A fire station is located in the southwest corner of Precinct 7.

Precinct 6 comprises predominantly small scale detached residences and some multi-units. The air traffic control tower is listed as a transport land use and is located on Tirangi Road within the precinct. There is a small amount of industrial use on Coutts Street. There are also some community services land uses in the Precinct. A small part of Rongotai College (generally open space) is in the south west corner of the Precinct.

There are some areas where residences and industrial land uses face each other across the street (eg. Rongotai Road) presenting interface and compatibility issues.



District Plan Zoning

Precinct 5 is zoned Suburban Centre and Outer Residential.

Precinct 6 is zoned Outer Residential and Airport.

Precinct 7 is zoned Suburban Centre and Open Space A.

The adjacent zoning to the west is Outer Residential and east is Airport.

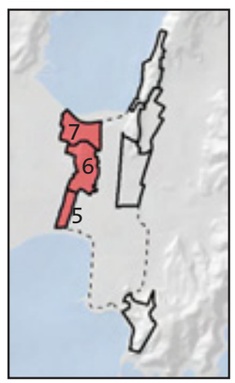
The main land use in Precinct 6 is residential.

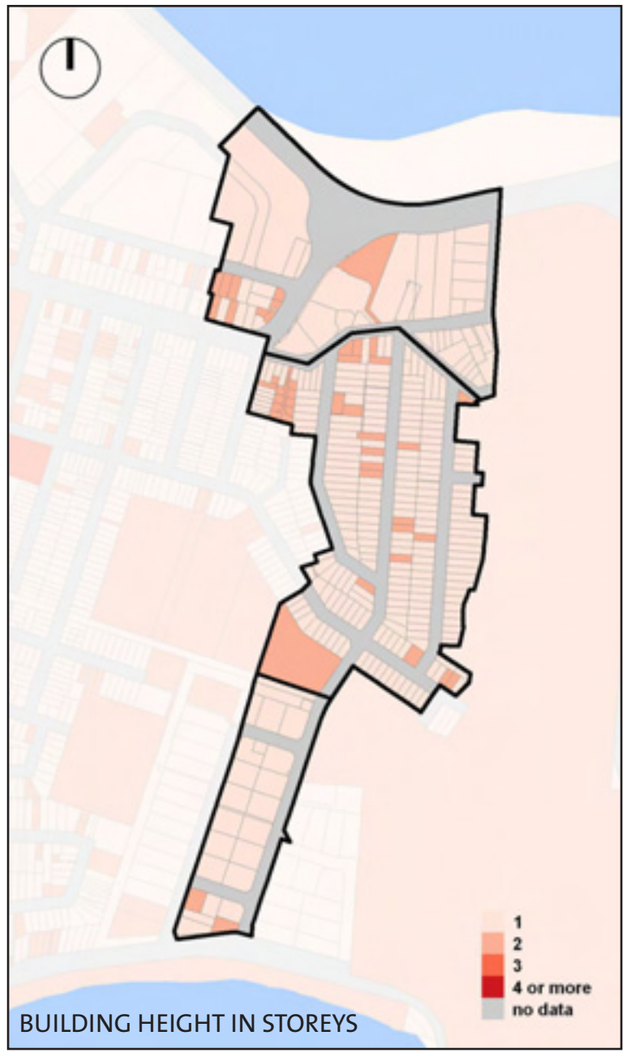
The fire station tower is a landmark land use in Precinct 7.

Part of Rongotai College is located in the southwest corner of Precinct 6.

The industrial land uses in Precinct 7 fit into the pocket between Evans Bay and the hill.

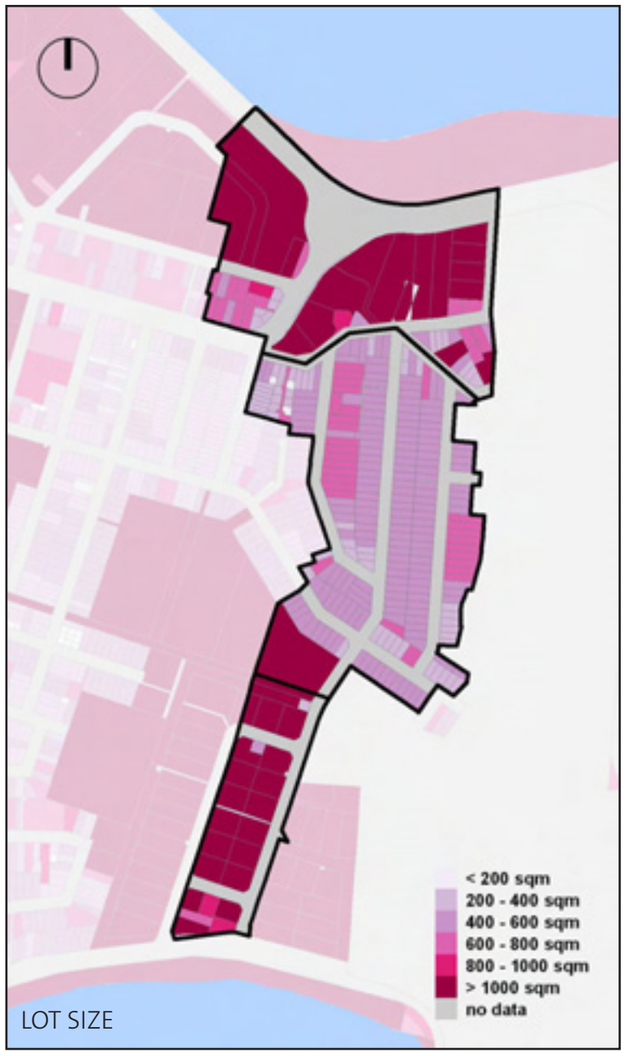
KEY MAP





Building Height

Most buildings are one storey in height. There are no buildings of more than two storeys in the precinct (except the air traffic control and fire station towers). The industrial and commercial buildings in Precinct 5 and 7, while mainly one storey, are a greater height than the residences (larger floor to ceiling heights).

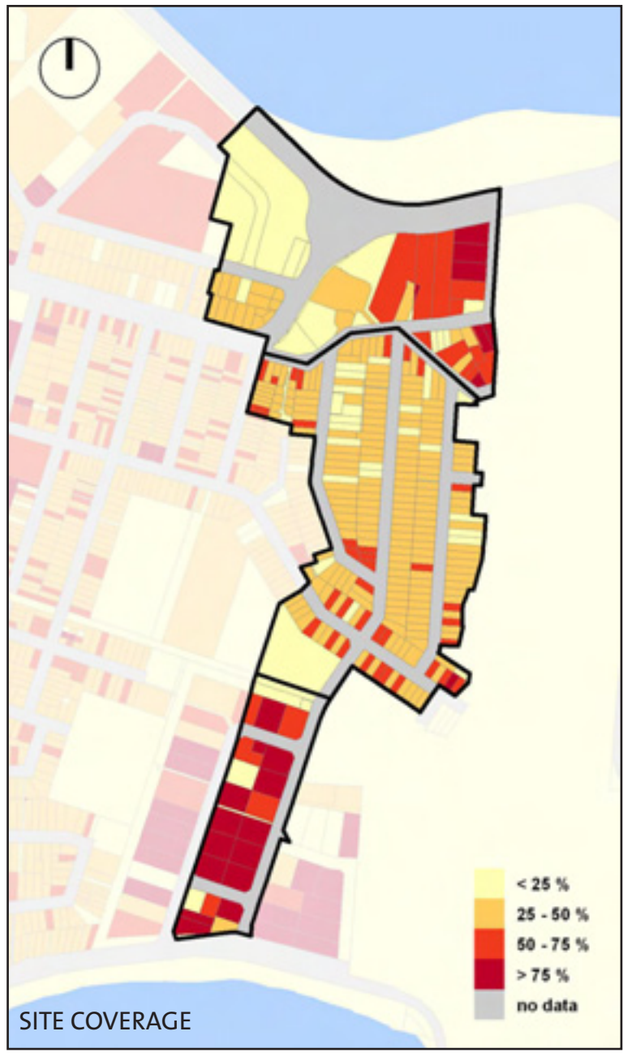


Lot Size and Shape

Most residential lots are rectangular in shape. The standard lot size is 12m wide x 36m deep with an east/west orientation. Most lots are 400-600 sqm in area. Where Lonsdale Crescent curves to fit the contours, lots are less regular in shape.

Industrial/commercial lots in Precinct 5 are large (>1000 sqm) and irregular in shape.

Industrial/commercial lots in Precinct 7 are large (>1000 sqm) and square in shape.

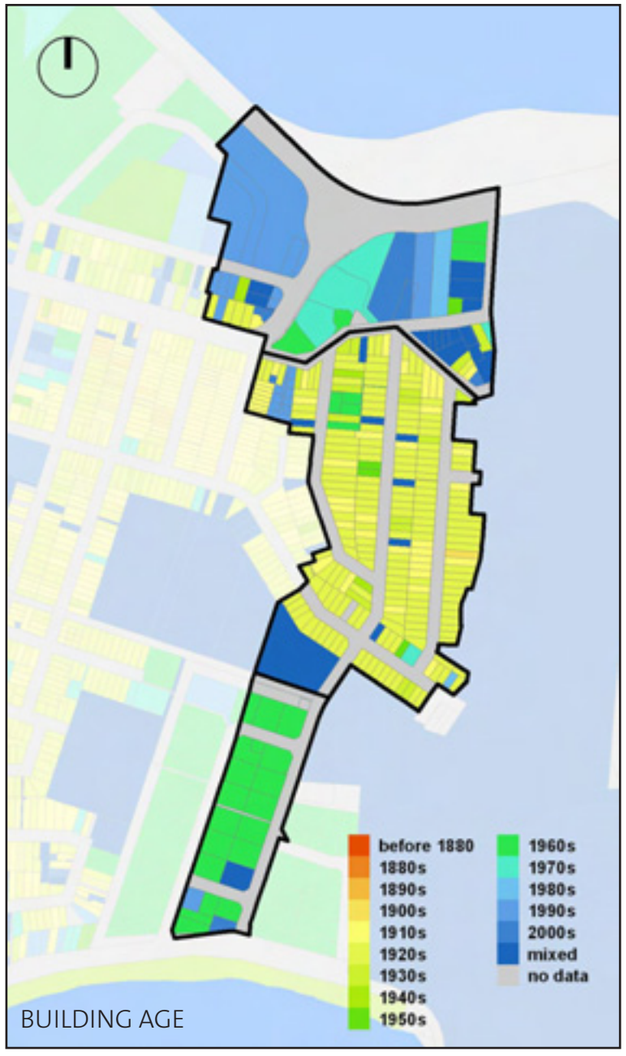


Density

Site coverage varies from less than 25% to greater than 75% with most residential lots in the range of 25-50%. Most industrial/commercial lots have greater than 50% site coverage. This is relatively high site coverage compared to Wellington as a whole. Site coverage is generally higher in the flat areas of the precincts.

Buildings are predominantly aligned to the street. Residences are located in the front half of the lot with 6-8m the average setback from the front boundary. Industrial buildings in the Precincts generally have no, or minimal, setback.

STREET PATTERN AND BUILDING FOOTPRINTS



BUILDING AGE

Street Pattern and Hierarchy

There is a grid street pattern in the precincts. The main streets, Tirangi Road and Bridge Street run in a north-south direction. Tirangi Road is discontinuous, connected only by a pedestrian way at its northern end, where the slope is steep. A pedestrian underpass (under the airport) connects Coutts Street with Miro Street in Miramar. Most streets are 20m wide, a width that facilitates vehicle movement, but is overly wide for a residential area. The airport forms a strong edge that prevents movement to the east of these Precincts.

Blocks are long (more than 400m) which is not good for ease of movement within a residential area (a block length of 90-120m is desirable as it provides increased directional choice).

Building Age, Type and Style

Buildings range in age from the 1900s to recent (post 2000s) buildings. The majority of houses were built in the 1920s (prior to the airport) in the bungalow style. The consistency of residence age and style and lack of modification to structures provides a consistent built form character to the residential streets. There is slightly more diversity of building age and style west of Tirangi Road. Most of the multi-unit housing was built post 1930. The industrial buildings in Precinct 5 are all post 1960s and mixed in ages, while those in Precinct 7 are mostly from the 1960s.

While building condition varies form poor to good, most residences have been maintained and have a good overall condition.

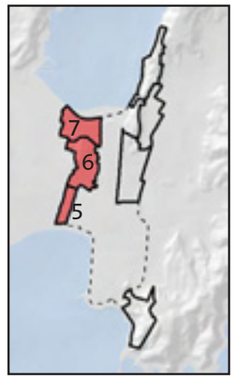
The majority of houses were built in the 1920s in the bungalow style.

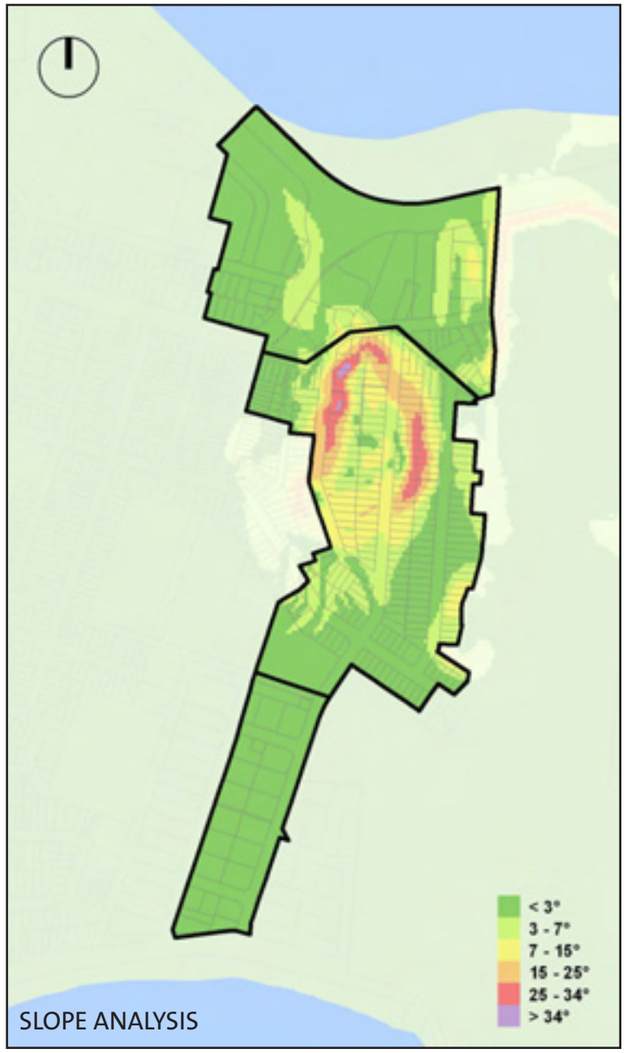
The wide streets and predominantly one storey buildings creates a low ratio scale of building edge to street width.

The pedestrian connection on Tirangi Road.

The pedestrian underpass connecting Coutts Street to Miramar.

KEY MAP





Topography

The hill in Precinct 6 creates a natural visual barrier between Kilbirnie and the Airport, screening the airport from this residential area of the city. The access issues due to the slope of the hill combined with the Obsticle Limitation Surface (OLS) requirements limit the potential land uses for these hill areas.

The hill also creates a green backdrop, contrasting with the sparsely vegetated streets on the flat areas surrounding it. The grid street and development pattern does not relate to the contours of the hill, with houses aligned to the street and accessed via steps or ramps.

Where land is flat (most of Precincts 5 and 7 and part of Precinct 6) this makes it suitable for a wider range of land uses.

Aspect and Views

The hill provides different aspects and views for houses located on the slopes. Houses located on Lonsdale Street have a western aspect and views over Kilbirnie. Tirangi Road provides views over the airport and an eastern aspect. Houses located in the northern section of Tirangi Road have a northern aspect and views over Evans Bay.

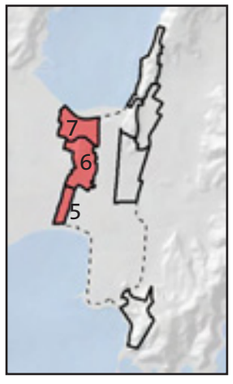
The airport control tower utilises the existing slope for visibility.

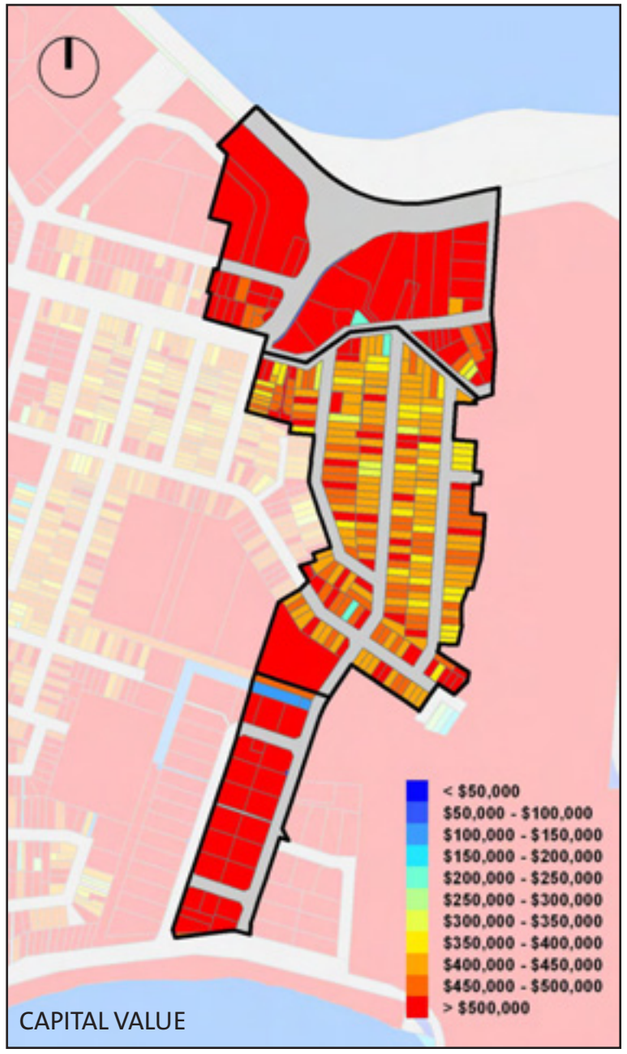
Houses on the east side of Tirangi Road have a view of the airport.

The hill viewed from Rongotai Road blocks the view of the airport.

Access issues limit the type of development opportunities on the slope.

KEY MAP

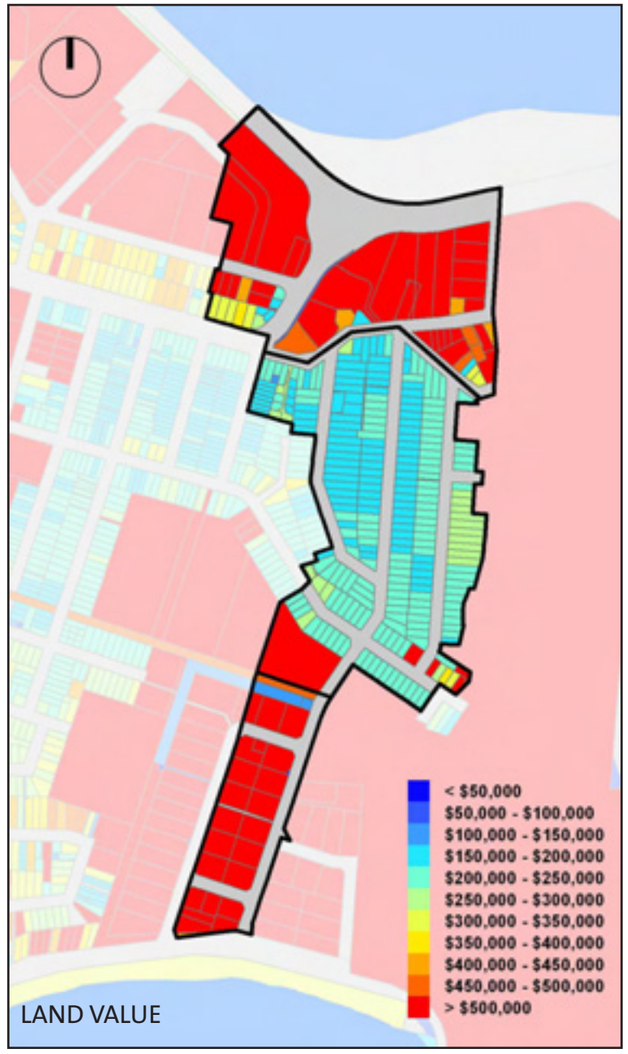




Capital Values

Capital values in Precinct 5 and 7 are mostly over $500,000.

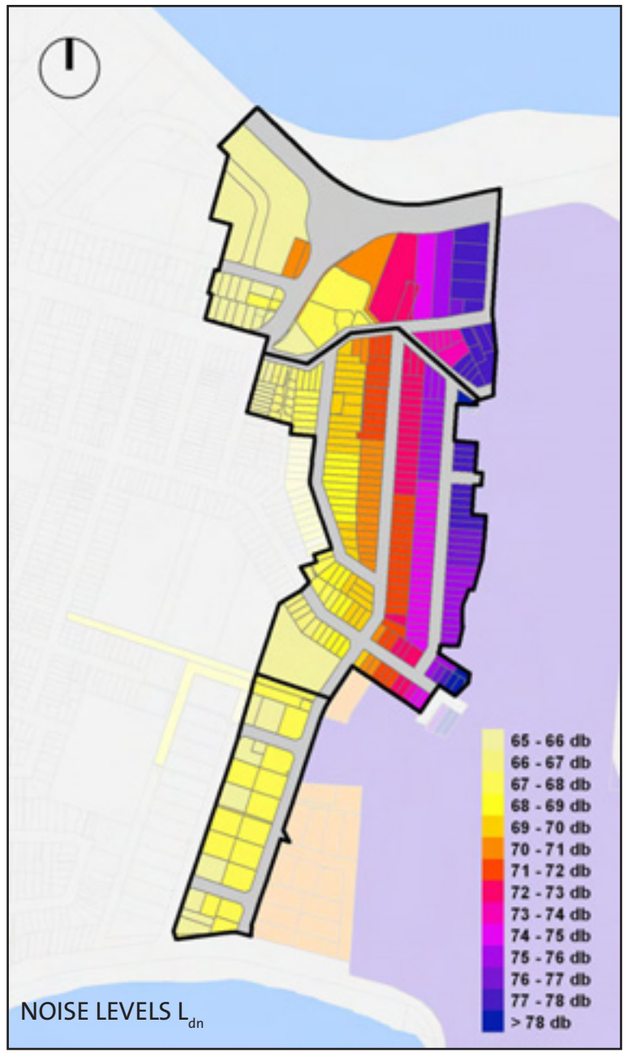
Capital values in Precinct 6 are mostly in the range of $350,000 to 500,000. Capital values are relatively evenly spread across the Precinct regardless of proximity to airport, noise level, aspect or views.



Land Values

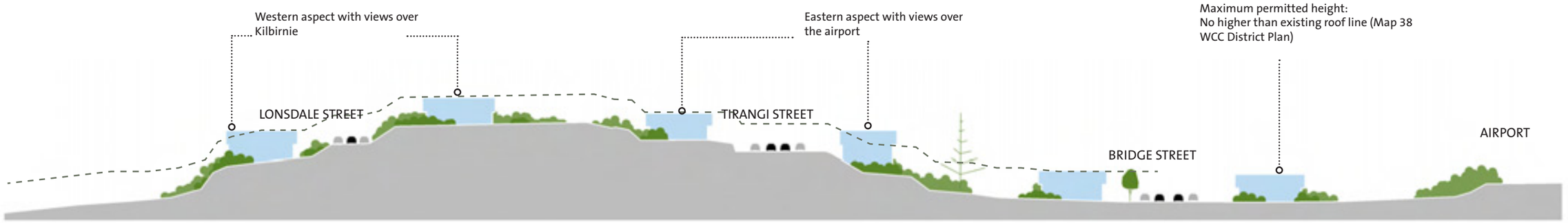
Land values in Precinct 5 and 7 are mostly over $500,000.

Land values in Precinct 6 are mostly in the range of $150,000 to 300,000. Land values are relatively evenly spread across the Precinct regardless of proximity to airport, noise level, aspect or views. The areas located on the flat land appear to be slightly high in value. The size of the land parcel is the biggest determinant of value.



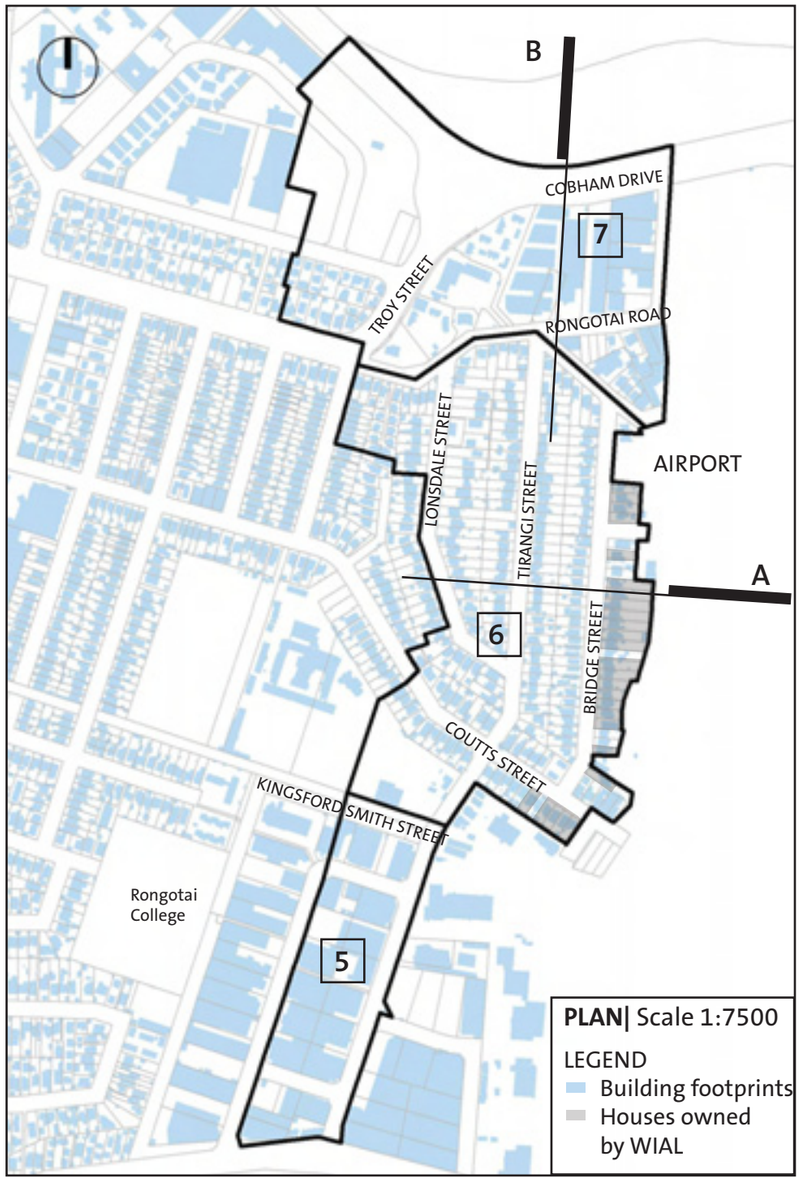
Noise Levels

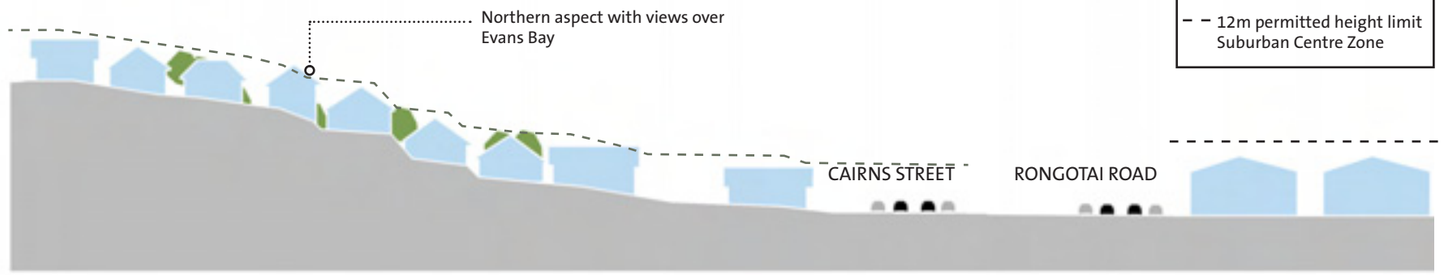
Noise levels range from L_{dn} 65-78 dB. The highest noise levels are received on Bridge Street and the end of Coutts Street. Noise levels are lower on the western side of the hill (Lonsdale Street).



SECTION A| Scale 1:1000

LEGEND
- 8m permitted height limit Outer Residential Zone
- 12m permitted height limit Suburban Centre Zone





SECTION B| Scale 1:1000

PRECINCT 5, 6, & 7 SUMMARY OF EXISTING CHARACTER RELEVANT TO FUTURE USE

Precinct 5, 6 and 7 are located on the west side of the airport.

- Land use is industrial and some commercial (suburban centre zone) in Precincts 5 and 7 and mostly residential in Precinct 6 (outer residential zone). There is also a pre-school located in Precinct 6.
- Many of the residential properties in Bridge Street are owned by Wellington International Airport Limited (WIAL) and will likely be removed and the land used for airport operations in the medium future as this is one of the most affected noise locations - they also correspond with the draft Airport Master Plan proposed changes.
- Site coverage varies from less than 25% to greater than 75% with most residential lots in the range of 25-50% which does not suggest a significant potential for infill given the 35% allowance for permitted activities.
- The majority of houses were built in the 1920s (prior to the airport) in the bungalow style which makes them less well insulated than contemporary buildings.
- Most residences have been maintained and have a good overall condition.
- The hill in Precinct 6 creates a natural visual barrier between Kilbirnie and the Airport which reduces the noise effects in that direction.
- The access issues due to the slope of the hill combined with the OLS requirements limit the potential land uses for these hill areas.
- The hill provides different aspects and views for houses located on the slopes.
- Capital values in Precinct 5 and 7 are mostly over $500,000.
- Capital values in Precinct 6 are mostly in the range of $350,000 to 500,000.
- Land values in Precinct 5 and 7 are mostly over $500,000.
- Land values in Precinct 6 are mostly in the range of $150,000 to 300,000.
- The size of the land parcel is the biggest determinant of value.
- Noise levels range from L_{dn} 65-78 dB. The highest noise levels are received on Bridge Street and the end of Coutts Street.

DISTRICT PLAN (and Changes)

NOISE MANAGEMENT APPROACH

The Wellington City District Plan is the main Wellington City Council (WCC) policy document in terms of directing and controlling the land uses in the city. It is a statutory document prepared under the Resource Management Act 1991 (RMA).

The airport has its own zone - Airport Area zone - which applies generally to the airport's operational 'footprint'. Within the Airport Area there are limits to operation including curfew on the hours of operation to avoid 12 midnight/1am to 6am period. The noise 'zone of influence' is represented by the Air Noise Boundary (ANB) which acts as an overlay to the various other zones contiguous with the airport (Residential, Suburban Centre and Open Space as described on District Plan Map 35). The District Plan seeks a balance between accommodating development within the ANB, while mitigating the effects of airport noise through an insulation standard. These standards differ for zones over which the ANB is overlayed.

For the residential areas within the ANB, the District Plan specifically manages residential development (including multi-unit where there is three or more dwellings created) as a discretionary activity for which a resource consent is required. The specific assessment criteria Council uses to determine whether a resource consent should be granted for each case are set out in the District Plan. The criteria require noise effects on an increased number of residents to be assessed along with the potential for reverse sensitivity constraints on the airport's operations.

The current Residential Area provisions for the ANB do not address other potentially noise sensitive activities (such as tourism accommodation or rest homes for example). Nor does the Plan limit alterations or additions to existing dwellings; or single dwelling infill within the ANB.

The Suburban Centre Area zone provides for a wide range of activities to provide for commercial and industrial development. There has been recent work by Council to review the approach to managing Suburban Centres. The proposal currently is to nominate which of these zones should be managed for a mix of residential with employment, and which should be retained more exclusively for employment related activities. The Suburban Centres review is at the draft stage currently.

There would be new noise management provisions within Suburban Centres as a result of the review that allow higher noise generation in employment areas where residential use would be limited. The policy also seeks that any new residential properties (as noise sensitive activities) that were developed would be insulated to limit the effects of the increased noise environment on them.

Insulation standards currently used in the Central Area and Port Noise Affected Area ($D_{nT,w} + C_{tr} > 30/35$ dB) are proposed to be carried over to apply to all new residential development in Suburban Centres (except within the ANB) as a result of the review.

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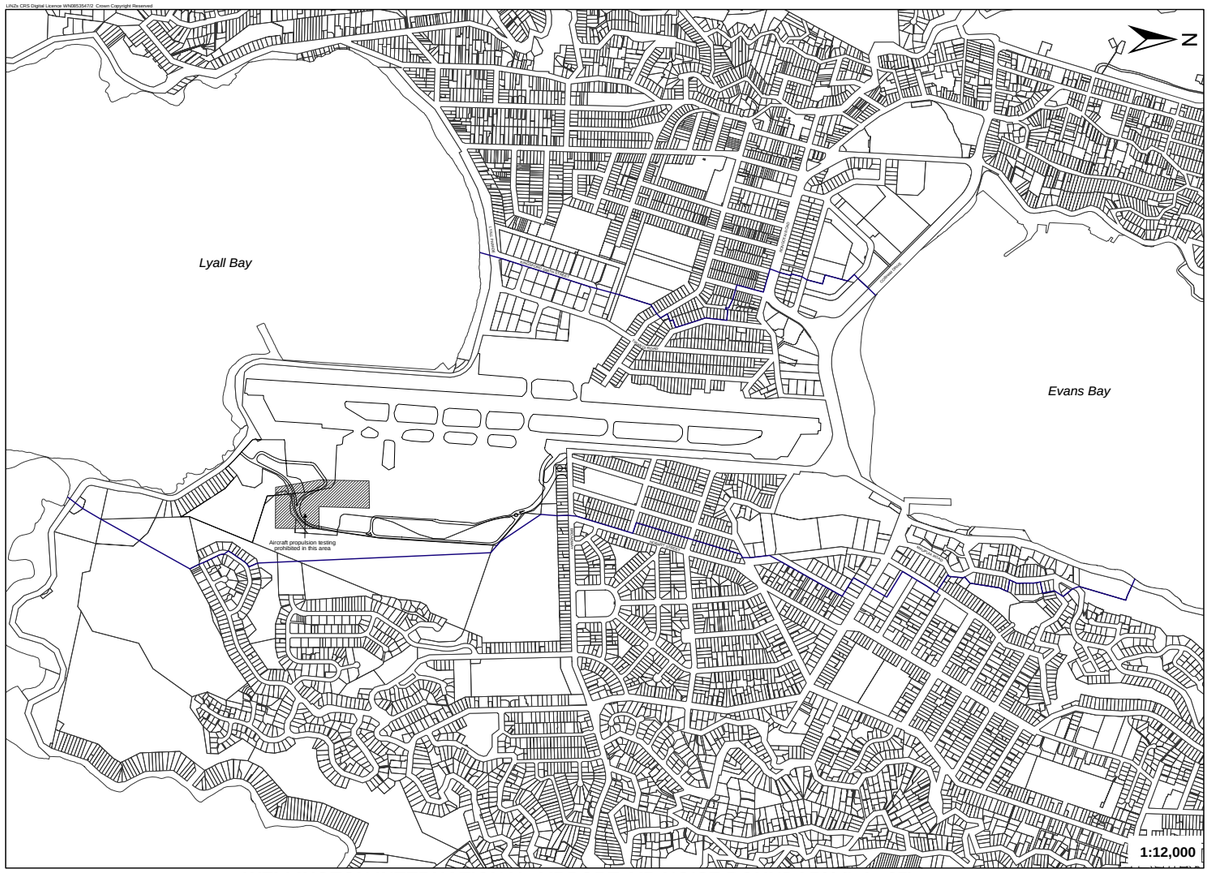

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Absolutely Positively Wellington

WELLINGTON INTERNATIONAL AIRPORT AIR NOISE BOUNDARY (Ldn 65)
Refer to Rule 11.1.1.1

OPERATIVE: 27/07/2000
REPRINTED: 02/11/2005

This $D_{nT,w}$ approach is effectively a building wall design specification for effective insulation against noise, as different than the current approach within the ANB of calculating the desired level of sound insulation to achieve the specified internal noise criterion. The aim is the same - seeking an internal noise level of no more than L_{dn} 40 dB - but the approach is a specification for the construction required to achieve it - this provides some certainty within the new building design process.

A key question for this study (LUMINS) is whether this approach should be similarly carried over to apply to new residential development in the ANB. This would give a consistency in approach with the other known noise sensitive areas of the city. It is understood that this approach is being used successfully for the Dunedin Port Noise Affected Area.

INFILL HOUSING POLICY (2007)

In May 2007 Wellington City Council introduced Plan Change 56 to enable it to better manage infill (backyard type) housing. This plan change is relevant to LUMINS as it put in place tighter controls on residential development to better protect the character and amenity of existing residential areas. In effect the plan change aims to limit changes in density to most residential areas of the city and target it to locations around nominated centres. There was strong community endorsement for this change.

URBAN DEVELOPMENT STRATEGY (2006)

This WCC strategy defines a long term direction (30-50 years) for urban development in Wellington. It proposes to direct growth to where the benefits are greatest, where adverse effects are minimised and improve the quality of development.

The growth scenario for long term planning purposes is 50,000 more people in the city by 2055. One of the key features of the strategy is a proposed 'Growth Spine' from Ngauranga to Wellington Airport defined as 'transit orientated intensification of employment and housing along a spine of growth'.

The two key implications for the airport area from this strategy are:

1. **Improved transport connections to the airport.**
   The location of the airport as the end point of a growth spine which is supported by a core public transport link and some road improvements implies the likelihood of enhanced accessibility from within the city to the airport and its surroundings. The transport implications are discussed in greater depth in the Ngauranga to Wellington Airport Draft Corridor Plan below.

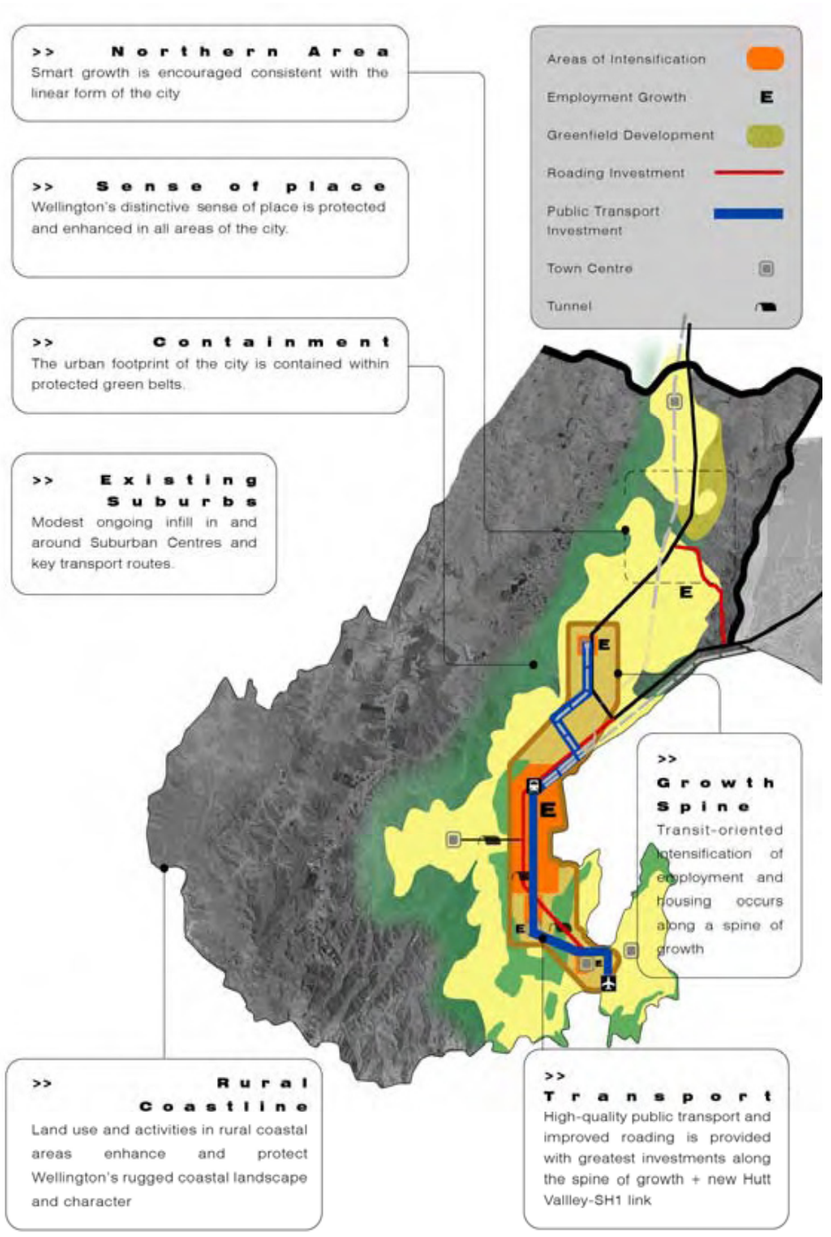
2. **Future growth along the spine.**
   Both residential and employment growth is proposed to be directed along the growth spine providing opportunities to intensify current land uses around the airport area.

NGAURANGA TO WELLINGTON AIRPORT CORRIDOR PLAN (2008)

This plan is connected directly to the Wellington Regional Land Transport Strategy (RLTS 2007-2016) which guides the long term development of the region's transport system. The plan outlines the current and ongoing activities and initiatives within the corridor then sets out proposed improvements and actions. The area of Kilbirnie is highlighted as a growth node in the plan.

3. Long-term direction for Urban Development

Our 50-year growth concept



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SUBURBAN CENTRES POLICY (2008)

This is a framework to assist the development and management of Wellington City's centres. It will be supported and implemented through more detailed policies (including the District Plan and centre plans). It introduces a hierarchy of centres to provide guidance on their role and function and to assist in assessing the appropriateness of proposed developments.

The Suburban Centres in the Air Noise Boundary are defined under the categories of:

Town Centres
Miramar (not within Air Noise Boundary area, but adjacent)
Work Area
Rongotai East, Rongotai South
Live/Work Areas
Miramar South, Ropa Lane Miramar

Town Centres are recognised as retail/community hubs servicing one of more suburb. Objectives include to strengthen the multi-functional nature of centres, including their role as community foci, public transport hubs, places to live and work and centres for entertainment, recreation and local services. The review of infill housing has identified areas around centres as offering the greatest benefits from residential intensification due to good transport accessibility, suitable physical characteristics and lower sensitivity to changes in character.

Live/work areas and work areas have more of a single-activity focus (industrial or large-format retail) and are not considered to be centres with the same roles and functions of centres. The policy looks at managing the impact of "out of centre" location of large format retail and the effects on centres and industrial land availability. Live/work areas are recognised as having a mixed use role and function including residential activities, while work areas have no future anticipated residential activities.

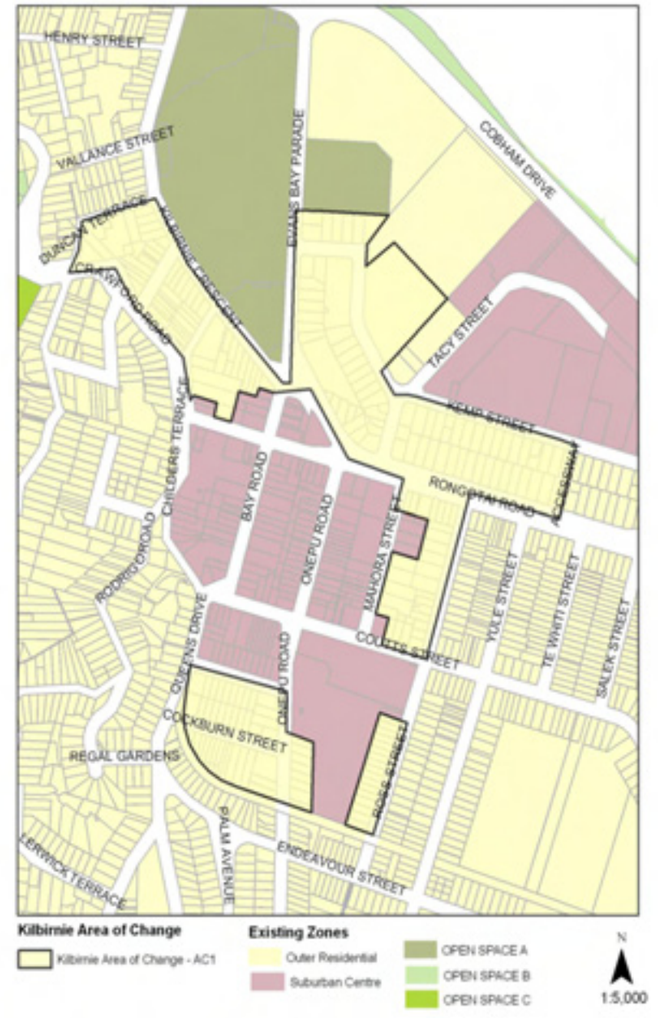
The Kilbirnie Sub-Regional Centre is described as having several parts that are located within a wider catchment including the Airport and Rongotai West. Building and improving connections between these parts is listed as a key aim of this policy.

HOW AND WHERE WILL WELLINGTON GROW? DISCUSSION PAPER (2008)

As part of the implementation of the Urban Development Strategy, Council initiated a major review of infill housing opportunities. This discussion document forms part of this review. The main initiative outlined in this discussion document is a targeted approach to infill housing - encouraging growth in and around key centres with good infrastructure and public transport, while restricting growth in areas of 'special' character (refer to Infill Housing Policy above).

The paper lists 'areas of change' (growth areas) and 'areas of character protection'. Kilbirnie, Miramar and Lyall Bay Parade are listed as areas of change in the paper. These are areas where comprehensive redevelopment of housing would be encouraged and facilitated, resulting in moderate to significant increases in residential density and changes to the character of the areas.

It is noted that following public feedback on this strategy, Council has changed its plan to concentrate only on three centres in the near future: Kilbirnie, Johnsonville and Adelaide Road. Kilbirnie is most proximate to the airport area, but is not immediately affected by the ANB overlay.



KILBIRNIE AREA OF CHANGE

PART 1 KEY ISSUES SUMMARY

NOISE INSULATION FINDINGS

In general, noise has an effect on the residents of the area within the ANB and influences their quality of life and the decisions they make. There are cost/value implications for insulation and existing District Plan issues in respect of managing development within the ANB. Particular points in these respects are:

- The main reason people want to move out of the ANB, if they are considering moving, is airport noise.
- The majority of residents indicate that airport noise has at least some negative impact on their satisfaction with living in the area.
- 70% of residents say that airport noise interferes with their conversations. Residents in higher L_{dn} zones are more likely than those in low L_{dn} zones to say that airport noise interferes with daily life such as sleeping and watching TV.
- Residents feel that airport noise affects them more outdoors than indoors.
- Airport noise is most annoying weekdays 6pm-10pm.
- Less than half of the houses have had some form of insulation since construction which means that there are many people experiencing unmitigated noise levels.
- Newly arrived residents are more likely to complain about airport noise than those who have lived in the area for some time.

- The cost of insulating existing houses is significant, under both the L_{dn} 40 and 45 scenarios.
- The extra cost of insulating new houses is not significant in terms of overall construction costs, except for the most noise exposed housing under the most stringent noise insulation scenario.
- There is evidence that the delivery of education at Miramar South School could be improved through the insulation of certain school buildings. The cost of insulating existing educational facilities within the ANB is significant.
- The insulation of existing housing against airport noise is unlikely to positively impact on house value.

- Current noise levels are L_{dn} 3-4 dB quieter than what is permitted under the District Plan.
- Relatively few complaints are received about noise.
- Under existing District Plan provisions residential intensification is encouraged, subject only to less than ideal noise insulation.
- Under existing District Plan provisions the extent of the effect of aircraft noise on the likely future population is likely to be significant.
- Further to the Environment Court decision (known as the Corrigan case), some residential conversion of existing industrial areas (Suburban Centres) within the ANB is possible, depending on the area's visual amenity and relative position within the ANB.
- Under the existing District Plan provisions non-residential noise sensitive activities are permitted inside the ANB and do not have to be insulated (eg childcare centres or tourist accommodation).
- Under the existing District Plan provisions, additions and alterations to existing residential dwellings are permitted without acoustic insulation.

CHARACTER FINDINGS

In general, the character of the ANB area varies widely as each of the precincts has different combinations of the character elements assessed. This variation suggests that a one size fits all approach to land use will not be appropriate and that there will be different responses possible in different locations. Particular points in these respects are:

- Building height is constrained by the OLS and Airways designations on the west side of the Airport and also Wexford Hill.
- There is a problematic road hierarchy in the Kilbernie/Rongotai/Lyall Bay area as any large vehicles or large quantities of traffic seeking to move between State Highway 1/Cobham Drive and Lyall Bay/Rongotai must traverse the residential streets of Kilbirnie.
- Road access around the Wexford Hill/Rongotai Ridge area is also constrained by topography.
- The affects of noise levels are the greatest in the areas to the east and west of the airport runway and this will be important to consider for change from current residential use and/or forms of residential development.
- Steep topography in parts of the ANB, particularly around Tirangi Road and in Maupuia, is influential to the type of development that will be possible there - it will generally be unsuitable for commercial or industrial uses.
- The aspect (views/sun) afforded by the topography in some places presents opportunities for alternative land uses.
- The majority of housing within the ANB dates from the 1920's and 1930's and although there has been some renewal and infill, there are opportunities for change to reflect changing lifestyle and demographic needs.
- The current lot size of individual residential sites will constrain more comprehensive forms of redevelopment.
- Under utilisation of the visual amenity and proximity of the south coast for the areas which are around Moa Point, but particularly on the west side of the ANB's coastal interface.
- The larger lot sizes on the ANB west side in the current commercialising area present more flexible options for redevelopment.

STRATEGIC CONTEXT FINDINGS

WCC has initiated strategic planning for the future growth and change in the city and there are some contextual points of note from this work:

- WCC's Urban Development Strategy anticipated significant intensification along the 'Growth Spine' which terminates within the ANB area.
- Significant transport infrastructure improvements to the City to Eastern Suburbs route are likely to emerge from the Ngauranga - Airport Corridor Plan and this suggests that the airport's function as a node should be considered in respect of mutually beneficial landuses. The wider context of the State Highway from the airport to north of Levin as a road corridor of 'national significance' is also noted.
- WCC's Centres Policy anticipates residential development alongside commercial development in suburban centre zoned land in Miramar South and Maupuia.
- Following public input, WCC have determined that further residential intensification will occur in only 3 areas (in addition to the CBD), including Kilbirnie. The precise extent of the Kilbirnie sub regional centre area is as yet unconfirmed.

PART 2 | LANDUSE OPTIONS

PART 2: LAND USE OPTIONS AND EVALUATION CRITERIA

The purpose of Part 2 is to: (a) identify and define the various types of land uses and activities that can be considered for the different precincts within the ANB; and (b) identify and define criteria that can be used to evaluate the land use options as to their appropriateness to meet the LUMINS purpose.

LAND USE OPTIONS IDENTIFICATION APPROACH

The approach to identifying land uses and activities that can be considered within the ANB has been, in conjunction with the application of local knowledge and understanding of urban dynamics in the Wellington area, to consider:

- **Current uses in the area**

  As described in Part 1 there is a general mix of residential, light industrial commercial and airport type activities within the ANB. The residential activities are known noise sensitive uses and special care will be required in how these are considered by the evaluation criteria. However, whatever choices are made about future land uses will need to provide for residential given that this is a predominant existing land use that will not change its predominance significantly in the foreseeable future.

- **Variations in the existing uses**

As described in Part 1 and the summaries to the precincts, there are some locations where there are opportunities to utilise certain attributes (for example good aspect in combination with lesser noise levels) to enable some location specific changes in the scale or density of some uses - including residential. These could only ever occur through a resource consent process that enabled the necessary assessment to be undertaken and for consent to be declined as appropriate. There is a concept for consideration in this respect which is that by encouraging residential *re*development (ie replacing existing older houses with new ones) then a better insulation performance from those new buildings could be achieved. This could be considered somewhat out of step with the current planning provisions (refer to Part 1 Urban Development Strategy) which aim for increased density around nominated areas of change.

An aspect of this concept that could be considered is whether increasing the density of residential development would both give additional uptake of change (ie there would be some market motivation to gain value from increased number of units) as well as insulation performance.

In respect of increased insulation performance there are possibilities to redevelop the site (or possibly for larger scale redevelopment) a collection of sites with outdoor and more noise sensitive internal activities such as bedrooms that are better positioned and away from the noise source, and where the material may be more substantial (ie concrete) and so better insulating than a smaller scale wooden structure replacement.

Industrial land in the subject area is also able to accommodate variations in type and scale. The historical uses in these areas have been heavily influenced by whole of sector changes which have been pronounced in the Wellington region as the New Zealand economy has moved away from a domestic manufacturing base. The areas in Rongotai and Miramar that are within the ANB, as well as contiguous with it, have changed markedly in terms of the type of activities that are accommodated there - their future is less easy to prospect.

One aspect of the changes to these areas that can be anticipated is an expectation for a greater mix of activities and use for what are typically considered commercial type activities (this is evidenced by proposals for the Rongotai Area for a large format retail complex). With this there is an expectation of higher amenity and in some places the change to more residential living mixed within. As noted above, some care with residential activities will be required within this environment. There are linkages in this element to Council policy on Suburban Centres which are described further below.

The airport itself as the biggest single activity within the ANB is also going to continue to have a fundamental role in the area. The changes that may be required within the aviation industry - such as towards safety, different sized aircraft and frequency of flights, together with the ancillary activities in terms of services, amenities and local transport can be influential to the airport's needs over the medium to longer term. WIAL have developed a Master Plan (draft as at September 2009) which sets out the airport's intentions and needs to 2030. This master plan is described further below.

- **Strategic influences**

  The strategic influences are explained more fully in Part 1 of this report, but primarily relate to the Wellington City Council's (WCC) District Plan and urban development policy, as well as WIAL's strategic planning, embodied in the Master Plan.

  With regard to WCC's planning the principal aspect of its policy direction of interest to LUMINS and the land uses option is the Suburban Centre's policy changes. There are residential aspects also of note in regard to where infill and intensification should occur. Areas of intensification are all out of the ANB area and are only relevant to the extent that the policy is not encouraging of intensification within the ANB.

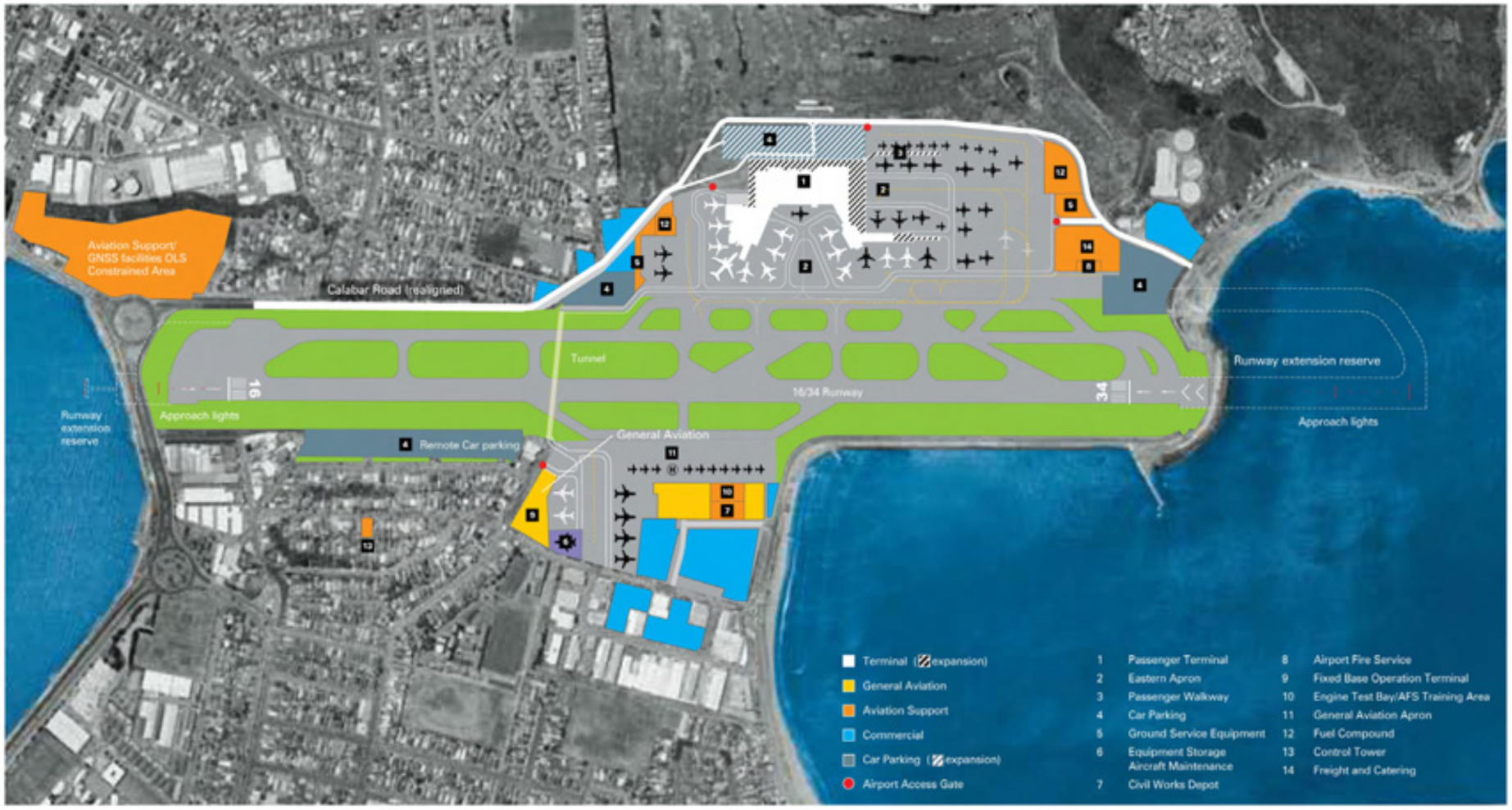
  Within the land areas zoned Suburban Centre the policy is to nominate some of these as living/working areas, or more exclusively for work. Within the subject ANB there are a mix of both and the option for more residential in the live/work centres (only in Mapiuia) will need consideration.

  With regard to the WIAL draft Master Plan (see below) the potential for extending the footprint of the airport is clear. To the east this potentially means changes to the alignment of Calabar Road, removal of some residential properties and some commercial areas, to the west again involves some removal of residential properties, car parking and commercial activities.

  The various land uses that may be possible, considering the above factors, are described below.

2030 Airport Layout

Figure 10-5



A RESIDENTIAL LAND USE OPTIONS

The range of residential land uses that may be possible in the ANB are considered below.

Some of these already occur within the ANB (for example, the suburban house) and others have potential suitability. As discussed earlier, the suitability will need to be carefully assessed to ensure that the risk of additional noise effects being generated are addressed by any change to the land use type.

Typical existing residential street in the area.

A1 SUBURBAN HOUSE

Detached house on single lots
500m^2 typical lot size in ANB
two to four bedrooms and garage.
1-2 storey

A2 MEDIUM DENSITY TOWN HOUSE

Townhouse with attached party walls - sometimes body corporate or separate titles
300 - 500m^2 typical lot size or in split larger lot
two to four bedrooms and garage.
2-3 storey

A3 HIGH DENSITY APARTMENTS

Apartment typology with some shared walls and floors.
body corporate and separate strata titles
100 - 300m^2 typical size
requires larger lot - over 1000m
one to three bedrooms and separate or bulk garaging.
3-5 storey

A4 ELDERLY HOUSING

Detached, townhouse or apartment typology with some shared walls and floors - ownership or rental.
Requires larger lot > 5000m2 to create
One bedroom, sometimes garage
50 - 100m^2 typical size
1-4 storey

A5 VISITOR ACCOMMODATION

Apartment typology with shared walls and floors giving vertical attachment between units.
Requires larger lot >5000m2 to create
One bedroom, sometimes bulk garaging
50 - 100m^2 typical unit size
1-4 storey, Typically on main road routes

B COMMERCIAL/INDUSTRIAL LAND USE OPTIONS

The range of commercial and industrial land uses that may be possible in the ANB are considered below. All of these either currently occur in the ANB or may be possible in the future due to market demand.

They all have generally internalised functions and tend to be places of work that are not where people live or sleep and are in that sense less noise sensitive. However, the smaller scale retail and to some extent any quality office/industrial type space will be attracted by amenity in the form of quality external space (such as for outside seating) as well as view or outlook.

As noted earlier there is some WCC policy tendency towards mixed uses for retail type activities that encourage residential at higher densities in conjunction with commercial uses (ie ground floor retail and residential above which is a consideration, but in relation to potential noise issues must be carefully considered.

To some extent airport related activities of a commercial and industrial nature could be included in this group, but a separate type is identified below for airport related activities.

Typical scale of commercial and industrial activity and structures in the area

B1 SMALL RETAIL

Small retail of less than 500m2. Could be isolated dairy or store or part of a group of shops. A variation on this type is also the smaller scale fast food outlet. Need for some parking/potentially 'drive through' . Potential for external amenity spaces associated for outside seating if food related

B2 LARGE FORMAT RETAIL

Large format retail of 500m2 or greater size. Large surface car parking area requirements. Vehicle orientated and typically little external amenity public space

B3 OFFICE

Office building - range of floor area sizes, and storeys. Car parking needs, often external. Can benefit from outlook and relationship to amenities for staff, including transport. Typically in locations with other office/commercial activities

B4 SERVICE STATION

Car park type area for vehicle movements, canopy over fuel pumps, ancillary shop, ancillary mechanics. Signage dominant.
Provides local shop role. Little external amenity in terms of public space quality

B5 INDUSTRIAL BUILDING

Industrial activities, warehousing or storage buildings. Tend to larger footprint sizes. Flatter sites for larger footprints, heavy transport needs. On site parking/external open yard space needs. Noise and amenity typically less of a concern.

C AIRPORT LAND USE OPTIONS

The airport is a major landuse in the subject area and it has a combination of types of activities that occur in association with the function. These include:

- large open hard surfaced areas for runway and apron
- large buildings to accommodate passenger and freight terminal functions
- associated commercial activities which can be ancillary to the airport such as for supply to aircraft, goods distribution or mechanical servicing
- large open areas or structures to accommodate car parking and access roads

as well as associated visual amenity spaces

Typically the airport and associated functions require flat areas of land and they tend to be contiguous with one another. The airport is relatively 'fixed' in the sense of the LUMINS study in that it cannot changes the position of its footprint - it can only expand and retract from its current position.

For the purposes of LUMINS the options are distinguished as either building type development or open space for parking/open space amenity - it is assumed that the runway itself and terminal buildings will not relocate or change from the current location.

C1 AIRPORT SERVICE/COMMERCIAL

Storage and ancillary office and industrial facilities. Typically have larger scale and have little general public accessibility

C2 AIRPORT OPEN SPACES/ PARKING

Open areas for parking and amenity landscape - visual amenity for large parking areas and managing stormwater in ecologically sustainable way. Parking structures also possibility

D PUBLIC LAND USE OPTIONS

The range of public and community related land uses that may be possible in the ANB are considered below. Some of these already occur in the ANB (for example, Rongotai College and streets and reserves) and others new uses may be possible in the future due to changes in demographics or market demand. There may also be changes to streets and associated amenity reserves spaces that can occur.

Typical street road reserve space and school

D1 EDUCATION FACILITY

Childcare, Primary or Secondary School or tertiary facility including classrooms, hall and outdoor areas
Surface parking generally
Requires larger lot > 2 ha to create
1-2 storey
Typically near bus service

D2 RECREATIONAL OR CIVIC BUILDING

Council building, sports clubrooms, swimming pools, libraries.
Surface parking generally
Requires larger lot > 1ha to create
1-2 storey
Typically near bus service and main road routes and town/local centres

D3 HEALTH CENTRE/ HOSPITAL

A health centre operates in daytime hours. A hospital/ hospice will have patients staying overnight.
Surface parking generally
Requires larger lot > 2 ha to create
1-2 storey
Typically near bus service and main road routes

D4 OPEN SPACE RESERVE

DESCRIPTION
Reserves including road reserves and street spaces

D5 UTILITIES

DESCRIPTION
Public utility type structures and uses
Reserves including road reserves and street spaces

OPTIONS EVALUATION CRITERIA

LANDUSE OPTIONS EVALUATION CRITERIA APPROACH

In order to be able to evaluate the land use options a set of evaluation criteria has been developed. Those evaluation criteria are derived from the consideration of the following :

The Lumins Study Purpose

The study brief establishes a terms of reference which provides the objectives of the work , this being the focus on the land use management methods (in conjunction with insulation) that can be used to address the noise related conflicts between existing land uses (essentially residential and airport). Despite noise management being the focus, there has been some consideration given to the urban planning opportunities that may be consequent to the change in land uses that can occur in the future, especially where that relates to some of the strategic changes being proposed such as through the Airport Master Plan, and the WCC Suburban Centres review.

Guidance of ANMC

There has been a series of meeting of the Airnoise Management Committee in the process of undertaking this study. That group has provided guidance on the draft criteria which were revised as appropriate in response. The ANMC guidance has enabled the representative interests to be recognised and provided for in the criteria so that these interests can be provided for the decisions made about the appropriateness of any proposed changes in land uses.

Best Practice

The criteria being used to 'test' the options for land uses within the ANB need to reflect best practice technique for this type of study. In this case that means the criteria need to be:

- clear so that all the people with an interest in this study understand what they pertain to
- measurable as far as possible so some comparative analysis of relative fit of different options against that criteria can be made
- comprehensive so that the outcomes are robust and the objectives in respect of noise management are tested against all the right considerations for them to stand scrutiny

The criteria that will be used to test the land uses options described earlier in this report are set out and described below.

1. NOISE MITIGATION MEASURES

Benchmarks for Noise Mitigation

There are several different types of noise benchmarks to consider in evaluating the land use options for the subject area. Although different, all of the benchmarks have the common goal of seeking an acceptable internal noise environment for people living in the particular subject area.

The New Zealand Standard [NZS6805:1992] while providing a base definition for noise sensitive activities (a definition which notably has not been followed in the Wellington City District Plan) does not prescribe an ideal internal noise level. Instead, this Standard looks more closely at where noise sensitive activities are appropriate in proximal relation to airports. In particular, it prescribes projected L_{dn} contours be overlayed the subject airport, then uses these contours to prescribe what activities are appropriate, given their relative location to the airport.

The outermost contour prescribed is based on the future L_{dn} 55 dB contour and within which the Standard recommends some degree of noise mitigation is applied to manage the effects on noise sensitive activities. As the sound exposure contours increase (ie moving towards the subject airport) the Standard recommends higher standards of mitigation to a cut off at the L_{dn} 65 dB noise contour line. Past that contour (ie between the contour and the airport) the Standard recommends that noise sensitive activities are prohibited.

This Standard could not be applied fully to the Wellington scenario due to the airport being constructed within an existing built up area. This area included residential land uses immediately adjacent to what became (and are still) operational airport areas. Instead, only the L_{dn} 65 dB contour was established in the WCC District Plan (known as the ANB) and rather than prohibiting noise sensitive activities inside this contour, the associated District Plan land use rules attempt to manage the existing noise sensitive activities contained within the ANB.

Specifically, these rules attempt to ensure that ***new*** noise sensitive activities meet certain noise mitigation standards. While these standards will be described in more detail below, it is important to be aware that neither existing noise sensitive activities nor extensions to existing noise sensitive activities were subject to these rules.

NZS6805 aside, other New Zealand Standards identify and describe acceptable internal noise levels. NZS6807:1994 (also known as the Helicopter Noise Standard) notes that noise sensitive activities should deliver an internal environment of L_{dn} 40 dB. The Helicopter Noise Standard does not set a limit for existing noise sensitive activities.

NZS6809:1999 (also known as the Port Noise Standard) contemplates scenarios where noise sensitive activities are already present within a noisy environment and notes that an internal noise environment of L_{dn} 45 dB would be the upper limit of acceptability. Given that existing dwellings, particularly older buildings, are difficult to retrofit for noise mitigation, the L_{dn} 45 dB standard outlined in the Port Noise Standard is seen as a practicable approach to managing noise within existing urbanised environments.

Although L_{dn} 45 dB is not specified in the airport noise standard (as noted above), there is a general acceptance of L_{dn} 45 dB being the upper end of acceptable internal noise level, which is evidenced by its use both internationally and in other New Zealand standards (as also noted above).

This noise level (L_{dn} 45 dB) is considered to be an appropriate benchmark to adopt as the baseline measure for noise sensitivity inside the ANB. While attaining this acceptable internal noise environment of L_{dn} 45 dB inside existing dwellings is, in all but the noisiest of locations, generally achievable, insulating beyond this standard (say to L_{dn} 40 dB or less) in an existing building is a significantly more complex task. While an internal noise environment of L_{dn} 40 dB would be an 'ideal world' goal, the relative benefits of the additional noise reduction to less than L_{dn} 45 dB are difficult to justify when the scope of work and costs are considered.

Experience from other airports has also noted the issues faced with retrofitting existing houses for noise mitigation. This is known to be apparent at Auckland International Airport, where in an operative noise insulation scheme running for the last 5 years, the L_{dn} 45 dB has been used as the benchmark for improving dwelling's noise mitigation performance. In this instance, the L_{dn} 45 dB was used as the best practical option, although it is noted that home owners had the option (at their cost) of insulating beyond this level if they chose to.

The constraints of insulating to deliver an internal noise level of L_{dn} 45 dB for ***existing*** older dwellings are described above. However, for a ***new*** dwelling if specified appropriately, even the normal modern materials and building techniques can deliver an internal noise environment of L_{dn} 45 dB with ease. With relatively little additional cost further reductions in noise levels can be achieved to less than L_{dn} 45 dB.

Given the relative ease with which new dwellings can be built to achieve internal noise levels of less than L_{dn} 45 dB this is an opportunity that should be taken. This is consistent with the Helicopter Noise Standard, which notes an internal noise environment of L_{dn} 40 dB is ideal for new dwellings.

With regards to new construction, and in addition to the New Zealand Standard benchmark, there are two other broad benchmarks which could be adopted:

WCC District Plan

The Wellington City District Plan has two sets of requirements for noise management outside of the Airport Area and these are broadly reflective of either a standard residential environment, or an environment where there are known issues or potential issues with noise between different types of land uses, typically with residential being one of those. The former of these benchmarks is recognised not to be applicable in this situation - the ANB is recognition in its own right of the noise conflicts between the airport and other, predominantly residential, land uses.

In respect of the District Plan's recognition of noise conflicts there are now two types of District Plan benchmark:

- the existing ANB requirements which are described in Part 1 (rule 5.1.3.8 - any new residential dwelling inside the ANB must achieve an internal level of L_{dn} 45 dB inside any habitable room with doors and windows closed); and

- the existing requirements for Port Noise Areas and the Central Area which require the habitable rooms of buildings to be insulated to manage the effects of external sound through insulation design to the measure of $D_{nT,w} + C_{tr} > 30$dB (some noisier areas require the external facade performance at 35dB). A schedule describes the materials that would be needed to be used in building construction to achieve this measure.

In addition to these construction standards, the WCC District Plan outlines further noise mitigation measures in the form of a curfew on activities inside the Airport Area Zone. In particular, land use rules specific to this zone set limits on operation including a midnight (for domestic/1am for international flights) to 6am curfew to avoid the period when people's sleep could be most disrupted by aircraft noise. The zone also has a 'rolling average' over 90 day requirement such that the airport's operation should not result in an excess of L_{dn} 65 dB outside the ANB.

Wellington Case Law

A real Wellington example where the opportunity to deliver noise insulation to a higher standard than the District Plan (or even the various NZ Standards) is seen in the decision by the Environment Court know as the "Corrigan" case. This particular application sought resource consent for four new residential units in Ropa Lane, Maupuia, which is within the Suburban Centres Zone. This consent was granted subject to noise insulation and mechanical ventilation being used to achieve indoor noise levels of L_{dn} 40 dB, with further insulation for bedrooms designed to achieve an L_{max} of 55 dB. Step 1(b) of the Stage 1 LUMINS report contains a more detailed discussion of this case and the potential precedent it sets.

Summary of Noise Mitigation Benchmarks

To summarise the noise mitigation benchmarks, given the noise mitigation practicalities facing retrofitting existing homes relative to new construction, it is appropriate to address 'new' and 'existing' dwellings separately. The New Zealand Standards describe an appropriate internal noise environment for an existing noise sensitive activity as being L_{dn} 40 or 45 dB. The application of mitigation measures that will achieve L_{dn} 45 dB for existing dwellings will give residents a significant improvement in their internal living environment. For the most part this will not involve substantial and costly rework of the building. As new construction can more easily achieve a higher internal noise standard than retrofitting existing buildings, a standard goal for new noise sensitive activities should be L_{dn} 40 dB.

2. NOISE SENSITIVITY RISK

The noise sensitivity of each of the land use options varies and accordingly the risk of the people associated with those land uses being affected by noise will be a function of:

- the type of activity it is - the noise sensitive activities are recognised in the District Plan definitions section as being residential, hotels/motels and like type temporary accommodation, and early childhood centres
- the variations in the type of activity and the construction of the buildings associated with it - for example an increase in resident numbers through new residential multi-unit development may generate increased risk of noise issues due to more people being affected, whereas redevelopment of new, but smaller units of good construction which keeps resident population to existing levels may reduce the risk through improving the noise insulating properties of the dwelling.
- the relative noise levels that exist in that location currently, or that could potentially occur in the future based on allowances the airport has for its operation as expressed in the noise contours.

3. INSULATION COSTS

The cost of insulating existing noise sensitive activities within the ANB has been described in Part 1 of this report. As that part describes, the higher the existing noise level context and the better the objective internal noise level sought, the higher the costs to insulate.

This is also affected by the age and condition of the building in question with older buildings being more difficult to achieve effective internal noise insulation for. In brief the cost to insulate the existing residential properties to an internal noise level of L_{dn} 45 dB within the ANB is between $23 million and $28 million depending on the parameters used to cost this work.

The degree to which the insulation is effective over time will also vary - with an older building the insulation will be dependant on maintaining the insulation levels - if exterior wall cladding deteriorates for example, this will affect the insulation of the dwelling as a whole.

As a criteria the test will be the degree to which for existing noise sensitive activities it is more cost effective to insulate the existing associated building or to change that land use due to the very high cost and its potential long term effectiveness.

4. ACHIEVABILITY

The degree to which the various land use option can be reasonably expected to be achievable into the future requires consideration. There has had to be some determination of what land uses are conceivable for the subject area (the approach to identifying these is set out in earlier in this report) as a starting point so all of these are considered at least theoretically possible. However, all of the land uses identified as possible will be more or less achievable dependant on factors such as:

- land and capital values which will reflect the opportunities for change on each site
- market demand for the land use activity in the area in question - this will vary over time
- the ease with which the proposed activity can be consented bearing in mind the District Plan provisions that apply (currently)

5. TIME FRAMES SUCH AS STAGING AND SEQUENCING

Consideration needs to be given as to how to stage land use changes to achieve the best noise management outcome in the ANB. The areas where the noise levels generated from the airport are highest could be the initial focus of changes to land uses. There are potentially considerations that relate to staging that are outcomes from the Airport Master Plan also.

The timing for any land use changes or other methods for achieving the best noise management outcomes will also be coordinated with changes that are made to the District Plan.

6. ENVIRONMENTAL EFFECTS and OPPORTUNITIES

The environmental effects relate to the potential for the proposed land use options to generate potential adverse effects in their own right. The changes from currently noise sensitive activities such as residential into other land uses like businesses, large format retail, airport activities or associated car parking can generate changes in the existing environment that have effects in their own right.

Types of adverse effects from some of the options may be in relation to:

- additional or different traffic movements (such as trucks or cars)
- loss of visual amenity from larger scale buildings or car parking and/or on prominent landforms
- changes in neighbourhood or community function from loss of residential activities
- reverse sensitivity (such as from residential activities in a Suburban Centre work area)

In addition to potentially adverse environmental effects there could be opportunities to improve the existing environment (in addition to noise benefits) through new land uses that have positive environmental effects. These positive effects may come from:

- improved visual amenity by the design of the additional airport land use extensions on the Calabar Road frontage
- improved vitality within live/work centres through the introduction of residential activities where these are compatible with business
- improved residential living diversity in the area through the introduction by a resource consent process of new smaller units in less noise sensitive locations with high visual amenity/aspect
- improved accessibility options for the future through redevelopment of new transport routes (such as Bridge Street and Calabar Road) that are realised by changes in the existing residential use context.

7. DEGREE OF FIT WITH STRATEGIES

The relevant strategies associated with the subject ANB area are canvassed earlier in Part 1 of this report. These are principally the Wellington City Council strategies for the development of Suburban Centres as well as the WIAL strategy which is embodied in the (currently draft as at July 2009) Master Plan. Although peripheral other strategies of Council around intensification and transport are noted.

PART 3 | LANDUSE OPTION EVALUATION

PART 3: INTRODUCTION

Part 3 of this LUMINS report presents an evaluation of the various land use options relative to the criteria, both of which were described in Part 2. Ultimately a proposed set of land uses is recommended for the land within the ANB and an outline for implementation is provided.

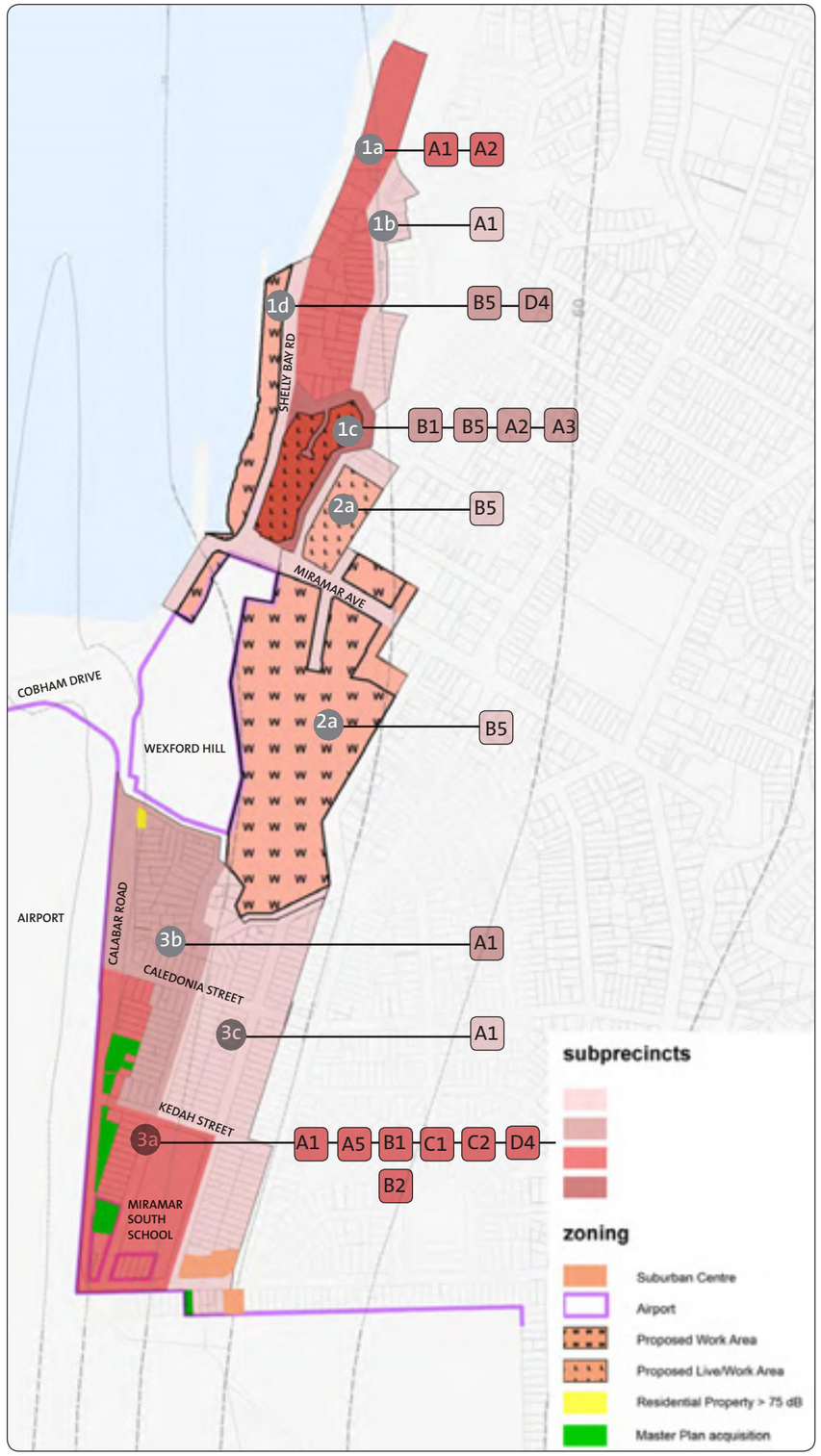
The evaluation uses the structure provided by the precincts identified in Part 1 to articulate the land use options considered. This enables the different conditions between each of the precincts to be recognised and provided for in determining the most appropriate land use options.

For each precinct a plan of the area with a reference to the land use types is used to convey either the proposed changes or proposed status quo..

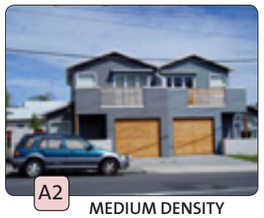
It is important to note that:

- Any proposals set out in this report for changes to land uses cannot take effect without a willing landowner - existing landowners can continue their current activities as long as they wish to. In time the proposals for changes are expected to be given effect to through the Wellington City District Plan and the outline for those proposals is noted in the implementation below. At that time there are statutory processes that are required to be followed before the land use zoning can be changed. Any landowners affected by these changes will be notified and can support or oppose such changes. The statutory processes set out under the Resource Management Act (1991) and administered by Wellington City Council will ultimately determine whether the land use zoning and associated rules will be changed. Even at that time existing uses are able to be continued until such time as owners want to change.

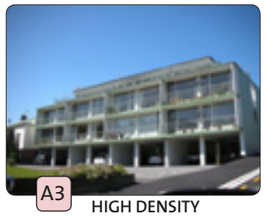
- Any proposals which involve the retention of existing land uses should be encouraged to insulate to prevent adverse effects from air noise. Incentives may be given to provide encouragement towards better insulation. The level of this incentive will vary depending on the location of the residential activity relative to the airport. Those closer to the airport are generally experiencing higher noise levels and thus are requiring greater costs for noise insulation which will need to be reflected in the level of incentive provided.



A1 SUBURBAN HOUSE

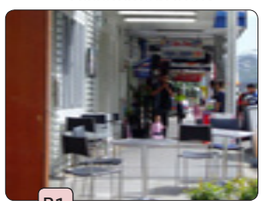


A2 MEDIUM DENSITY TOWN HOUSE



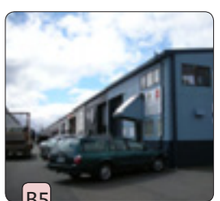
A3 HIGH DENSITY APARTMENTS

A5 HOTEL, MOTEL OR TEMPORARY VISITOR ACCOMMODATION

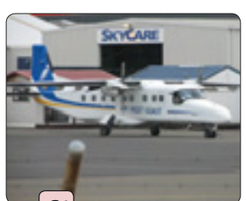


B1 SMALL RETAIL

B2 LARGE FORMAT RETAIL

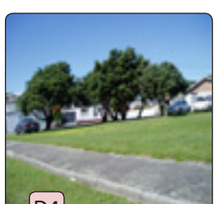


B5 INDUSTRIAL BUILDING



C1 AIRPORT

C2 PARKING



D4 OPEN SPACE RESERVE

PRECINCTS 1,2,3

Precinct 1,2 and 3 are located on the east side of the airport. Precinct 1 has been considered in four parts as each suggests different propensities for redevelopment involving either new types of land uses or retention of the existing land uses. Reference is made to Part 1 (which describes the existing environment) and Part 2 which describes the range of potential land uses and evaluation criteria .

Precinct 1a

The current land uses in Precinct 1a are residential. The benefit of this location for redevelopment is that contexturally there are some existing taller height buildings, larger sites and older buildings which suggests this may be a good area for redevelopment at greater density. Some sites are relatively large enabling multi-unit development. The sites to the west side are also able to gain some aspect towards Evans Bay. However, the area is within the L_{dn} 65-70 dB sound exposure range.

In considering the options for Precinct 1a continuation of the low and mid range density residential uses appears most appropriate. The change to less noise sensitive activities is unlikely to be appropriate given the access constraints for the likes of larger vehicles or increased traffic movements. The major constraint to any larger scale commercial type activities is the topography which is relatively steep combined with the potential for reverse sensitivity issues.

There is the potential for Precinct 1a to accommodate through a resource consent process higher residential density given the opportunities provided by the good west aspect from most properties in conjunction with some larger sites. The land values would suggest that the quality of redevelopment would tend to be higher (and thus construction quality and insulation effective).

There is some evidence of higher density residential development in the adjacent Precinct 1c. The Environment Court case law appears to support the use of the higher amenity location for residential development in combination with good quality construction that enables internal insulation standards to be met. However, recent WCC strategies towards residential intensification are focused around centres so a deliberate change to higher density in Precinct 1a may be seen to be at odds here.

As noted in the recommendations and implementation section of this evaluation, any changes to higher residential density should be subject to specific noise controls and design via a resource consent process - this should be consistent with the Corrigan case (35 dB facade (which gives L_{dn} 40 dB internal rooms), and further insulation to give L_{max} 55 dB internal performance for bedrooms). Consideration should also be given to changes to the ridgeline landscape that may occur from increased residential density, especially for the larger scale apartments.

Consideration was given to other forms of accommodation, such as elderly housing or visitor accommodation. However, the area is relatively isolated from facilities that would support these activities and so these are considered less suitable.

The alternative to higher density residential development for Precinct 1a is to provide insulation options to the existing landowners to enable an improved internal noise performance from the existing building. This would retain the current density of use for residential purposes and enhance the amenity of the existing dwellings. Given the noise range environment here the costs of insulation of existing buildings may also be in the lower range.

The recommendation for land uses in Precinct 1a is Land Use Options A1, and A2 in combination with both improved noise insulation District Plan rules for noise sensitive activities, as well as encouraging insulation improvements for existing residential property owners.

Precinct 1b

In Precinct 1b the current land uses are residential. The precinct does not have the same amenity as Precinct 1a in that its aspect is east facing and lots are in the smaller size range - this difference is reflected in the land values in Precinct 1b. The combination of slope, lot size, existing uses and potential reverse sensitivity effect and access suggest that this area is not suitable for less noise sensitive activities such as commercial. The most appropriate options are considered to be retention of the residential land use at the existing lower density.

The recommendation for land uses in Precinct 1b is Land Use Option A1 in combination with both improved noise insulation District Plan rules for noise sensitive activities, as well as encouraging insulation improvements for existing property owners.

Precinct 1c

The current land uses in Precinct 1c are a mix of commercial/light industrial and higher density residential, including residential apartments the consent for which was established through the "Corrigan' decision of the Environment Court. That decision addressed the issue of noise sensitive activities being increased within the ANB and found that with the appropriate insulation standards in construction (required 35 dB facade construction (giving an internal L_{dn} 40 dB performance and internal L_{max} 55 dB for bedrooms) the amenity offered by the location supported the proposed residential development at higher density.

Precinct 1c is within the area zoned Suburban Centre and this is proposed to be a live/work area that would allow for residential buildings as Discretionary Activities. Because it is within the ANB residential uses are excepted from compliance with new noise standards ($D_{nT,w} + C_{tr}$ > 30 dB) for any habitable room within the building. The current noise provisions for properties within the ANB continue to apply here.

The options for land uses considered most appropriate in Precinct 1c include the current mix of higher density forms of residential where amenity is high and commercial/light industrial activities or some greater or lesser proportion of one or the other. Consideration has been given to other land use options including visitor accommodation, elderly housing and airport related activities. However, for the latter the location is too distant from the airport to be useful for its core purposes. For other forms of residential activities as with the other Precincts 1a and 1b, this location is away from the types of supporting activities and with steep streets for access which makes it less desirable for older people.

The recommendation for land uses in Precinct 1c is Land Use Options A2, A3 and B1, B5 in combination with both improved noise insulation District Plan rules for noise sensitive activities consistent with non-ANB live/work areas, as well as encouraging insulation improvements for existing residential property owners.

Precinct 1d

Precinct 1d sits on the east edge of Evans Bay and includes the Burnham Wharf area. The current land uses are typically light industrial in nature with much of that activity relating to the wharf (at least historically). There is public amenity provided for by the wharf itself and this is a popular place for fishing from.

The area is a Suburban centre and the proposed changes to this zone would make it a work area. As with Precinct 1c the proposed new suburban centre noise management provisions are excepted here as it is within the ANB and the current ANB provisions would apply.

The coastal location and easy flat access would suggest some higher amenity opportunities for the future redevelopment of this area. However, the land is constrained in width and the current uses are likely to be incompatible with any forms of residential activity (although this could change over time). The land sits within the L_{dn} 65 to 70 dB sound exposure contour and its working nature suggests that it will continue to provide for light industrial forms of land use into the future.

The recommendation for land uses in Precinct 1d is Land Use Option B5 although the current uses for open space suggest an element of D4. The proposed provisions for noise sensitive activities consistent with non-ANB live/work areas, and work areas are recommended to apply.

Precinct 2a

Precinct 2a is a relatively simple area to address in respect of the future land use options. It is currently and consistently throughout an area that provided for work related industrial and commercial type activities. Much of the land is flat (although the west side is a steep escarpment), has larger lots and provides an economic and functional role within the city with its current uses - the work area zoning proposed for the suburban centres review supports this value in a strategic sense.

It is not contiguous with the airport and has limited potential to provide for any airport extension, but is proximate so can provide satellite services and facilities as required. The introduction of residential or noise sensitive activities would have the potential to generate reverse sensitivity issues for the current businesses operating there. The area is in lesser range of noise affected land within the ANB.

The recommendation for land uses in Precinct 2a is Land Use Option B5. The proposed provisions for noise sensitive activities consistent with non-ANB live/work areas, and work areas are recommended to apply.

Precinct 3a

Precinct 3a is predominantly residential at present with airport zone at the south end which accommodates some commercial activities. The Miramar South School is also located here. This precinct is contiguous with the airport on its west side and Calabar Road, which provides the main access to the airport, is aligned on this edge. Typically the lots are of a smaller size. This precinct is affected by higher levels of noise including some properties that experience noise beyond L_{dn} 70 dB closest to Calabar Road and the airport runway.

The general amenity of the residential properties closest to Calabar Road is further impacted on by the busy road and the topography which puts them below the airport runway level and the road itself which is most extreme at the south end. Strategically this precinct is affected by the WIAL draft airport Master Plan which proposes over time to widen the runway towards the east, which consequently requires relocating Calabar Road slightly further east and the acquisition of some of the first line of residential properties at the south end particularly.

The opportunities this presents (not overlooking the effects on existing residents which are recognised) is to not only improve the airport's operation, but to improve the amenity of this main access to the airport through the treatment of the landscape around the realigned road.

In respect of future land uses in Precinct 3a the residential uses are considered to remain appropriate for those areas which are not in the noisiest locations. This is a large area of residential properties and it can be expected that over time gradual change will occur as people improve the buildings through alterations and additions. The conditions (aspect, larger lot size, values) that may encourage large scale multi-units redevelopment appear not to be present, although again this may change over time as many of the existing buildings are of an older age (1910-20).

The location of the area close to the airport and its flat topography suggests opportunities for the airport's needs to be met through some use extending into this Precinct (as reflected in the Master Plan). The commercial opportunity potential (either as part of the airport function or independently) also seems a reasonable fit with the current node of commercial activities in this location on the west end of Broadway. There is some evidence currently of changing residential land uses to service type commercial activities (eg rental cars) in this location. There is some question as to how to best manage this transition in land uses at this airport interface. Communication with existing private and other land owners will be important and some certainty as to the future and timing will need to be given consideration to.

Options from a land use planning point of view are to extend the current Airport zone , or to leave the current zoning in place and continue to manage the area as residential with the airport proposals in the background. It is considered that for the certainty of people in the area generally, the affected parties and for more effective decision making by Council land use planning that rezoning this area for Airport would be appropriate. There will need to be discussion with Council about this and the timing of the process in due course.

As noted above the proposed area for Airport activities is a significant one for the city in the sense of this being the "front door" to the city for many visitors. It is considered appropriate that consideration is given to the way in which any new use of this area, including proposed roading changes, will enable a high quality environment to result, such as through an appropriate set of urban design requirements.

The recommendation for land uses in Precinct 3a is Land Use Options A1, A5, B1, B2, C1, C2 and D4 in combination with both improved noise insulation District Plan rules for noise sensitive activities, as well as encouraging insulation improvements for existing residential property owners. It is further recommended that those residential properties which are within the > L_{dn} 75 dB sound exposure contour are acquired and decommissioned from residential use. The school and preschool are noise sensitive activities and given their location within the ANB should be insulated.

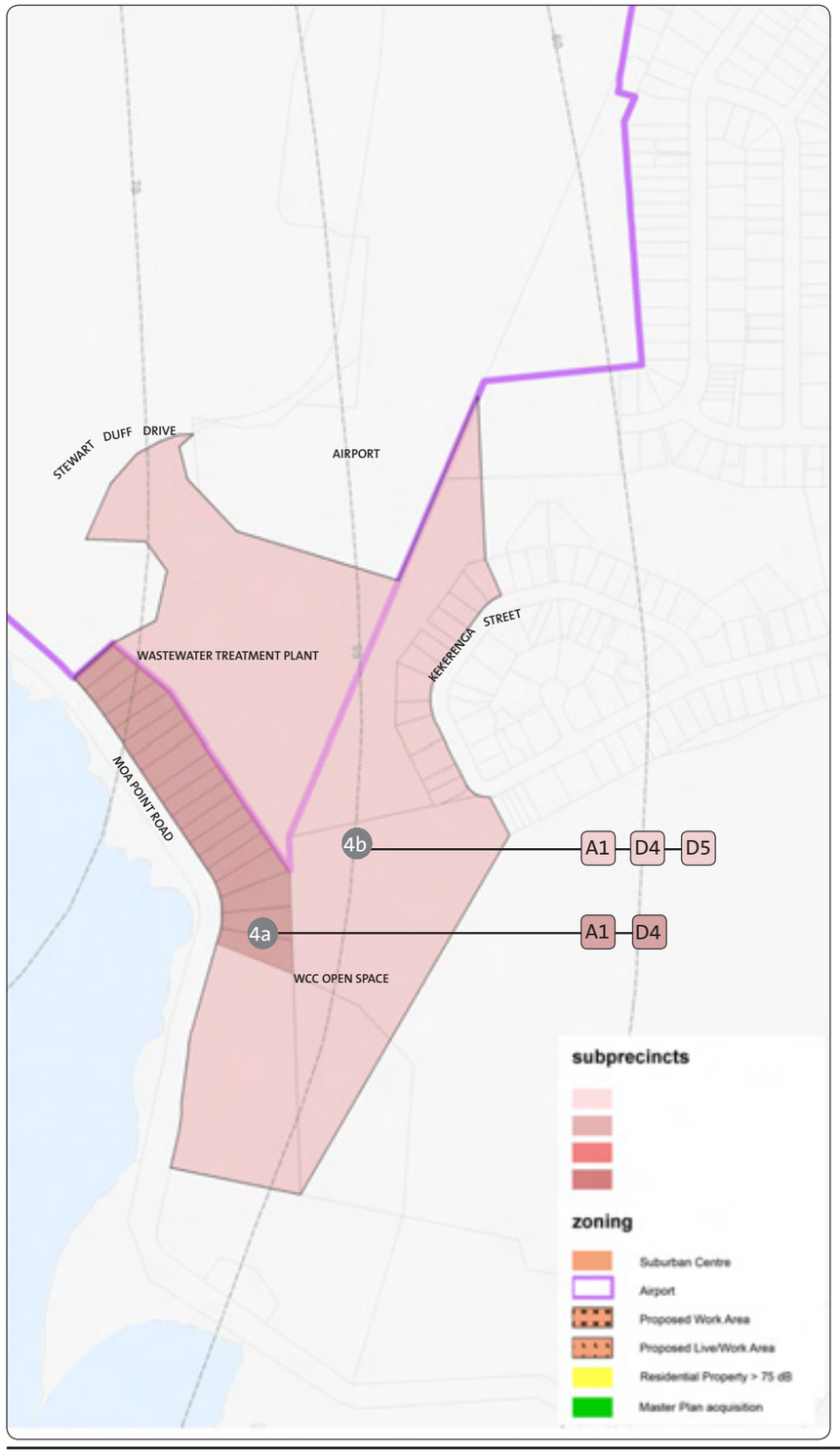
It is also recommended that the land required by the airport for the draft Master Plan is rezoned to Airport.

Precincts 3b and 3c

The current land uses in Precincts 3b and 3c are residential and the main distinction between the two are the topography which is higher in 3b with some residential properties enjoying a good west aspect; and the sound exposure levels that apply. There are some of the higher noise levels in the ANB in Precinct 3b including one property with greater than L_{dn} 75 dB, whereas generally they are in the L_{dn} 65-70 dB sound exposure range in Precinct 3c.

In common with Precinct 3a the residential conditions are similar and the expectation is that the current suburban housing density will remain into the foreseeable future for the most part. The current lot sizes, the comprehensive nature of the residential uses and the values in the area do not suggest any major redevelopment will occur for either alternative land uses or the residential high density alteratives. There remains a need to consider the appropriate ways to manage noise for the area given its proximity to the airport and for those properties (there is at least one in Precinct 3b) in the range > L_{dn} 75 dB decommissioning for residential purposes may need to be considered.

The recommendation for land uses in Precincts 3b and 3c is Land Use Option A1 in combination with both improved noise insulation District Plan rules for noise sensitive activities, as well as encouraging insulation improvements for existing property owners. It is further recommended that those residential properties which are within the > L_{dn} 75 dBA sound exposure contour are acquired and decommissioned for residential uses.



SUBURBAN HOUSE

OPEN SPACE

UTILITY

PRECINCT 4

Precinct 4 is located at the south end of the airport and has been considered as two parts. Reference is made to Part 1 (which describes the existing environment) and Part 2 which describes the range of potential land uses and evaluation criteria.

Precinct 4a

The current land uses in precinct 4a are residential. This is a discrete area of properties that sits at the base of the coastal escarpment and has good south coastal views and west aspect to sun. The open space values of the escarpment and the coastal strip are also a feature.

Because of the amenity the coastal location provides there can be some reasonable expectation of owners towards alterations and additions to these properties. There is some evidence of this currently which may well be a combination of the increased desirability coupled with the older age of the properties and their exposure to extreme weather conditions. Council is initiating protection for the coastal escarpment which is likely to limit the potential for development up this face which would otherwise provide potential for residential expansion in this precinct.

Sound exposure is in the L_{dn} 65-70 dB range, with those properties furthest to the west most affected. The draft Airport Master Plan shows a possible runway extension which would presumably alter the noise profile in this area bringing aircraft in closer proximity to this precinct.

The options for land uses in this location could include extensions to the contiguous utility (wastewater treatment plant), although there is no known need for such an extension. The land parcel sizes and the sloping nature of the site suggest the area has limited potential for commercial or industrial activities. This is location also has coastal landscape values which would suggest that large scale development would be challenged.

In general it is considered that the existing residential use is likely to be the most appropriate form of activity for the foreseeable future. It may be desirable to consider the implications for any runway extensions from the Master Plan for the noise environment of these properties.

The recommendation for land uses in Precinct 4a is Land Use Option A1, D4 in combination with both improved noise insulation District Plan rules for noise sensitive activities, as well as encouraging insulation improvements for existing residential property owners.

Precinct 4b

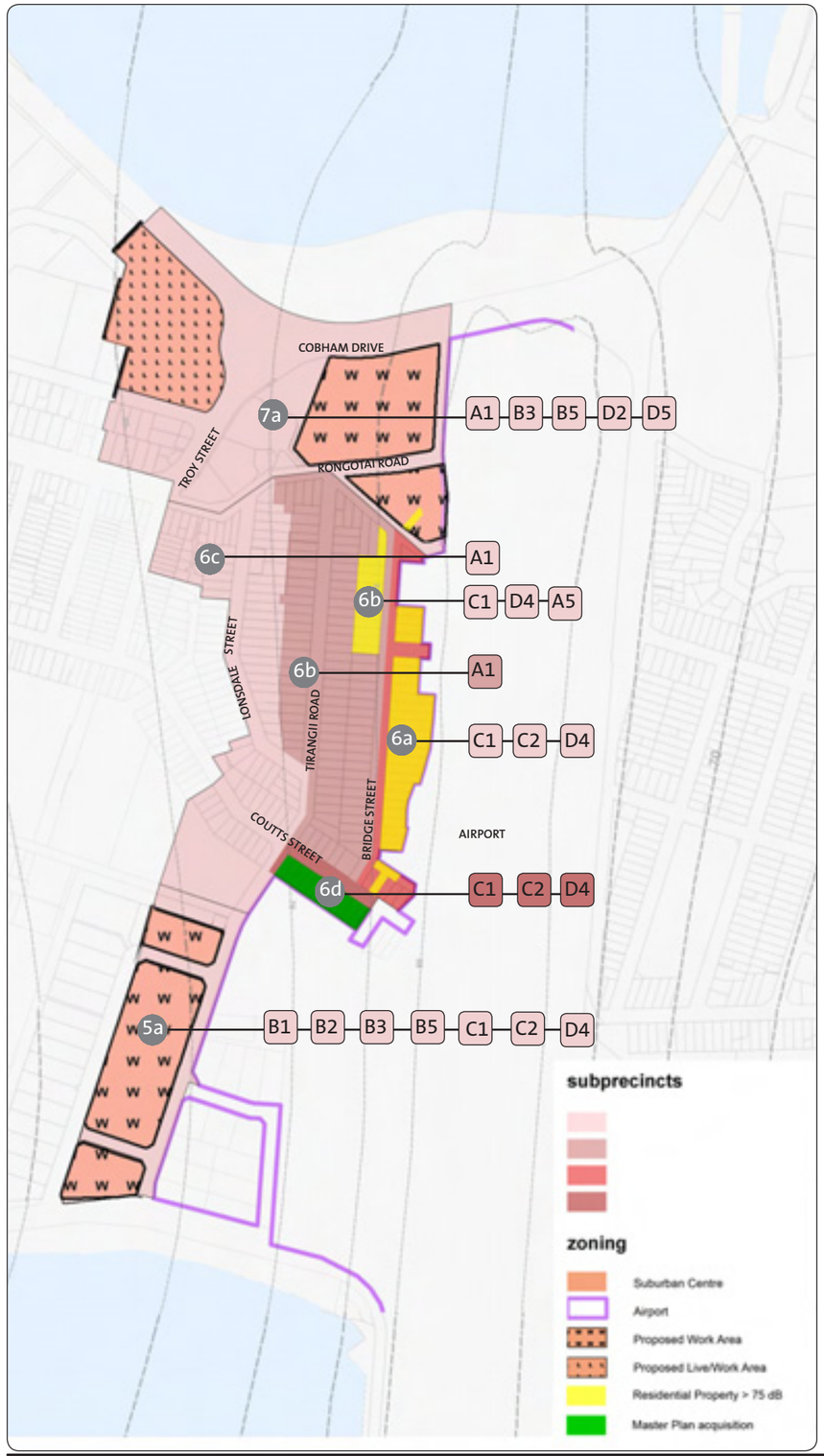
Precinct 4b is dominated by the wastewater treatment utility activity and the Wellington City Council owned open space. There is an enclave of residential activity on the hill top. These residential properties are of a 1960s era and tend to be within mid to low range of value.

They are within the L_{dn} 65-70 dB range within the noise contours. The location of these properties is dislocated from the airport and flat land of Miramar topographically as well as from an accessibility point of view.

There are few options from a land use point of view within this precinct aside from those that currently exist.

Although there would potentially be some benefit to the open space and landscape values of the escarpment from their acquisition by Council for open space, this is untenable and unwarranted.

The recommendation for land uses in Precinct 4b is Land Use Option A1, D4 and D5 in combination with both improved noise insulation District Plan rules for noise sensitive activities, as well as encouraging insulation improvements for existing residential property owners.




A1 SUBURBAN HOUSE


A5 HOTEL, MOTEL OR TEMPORARY VISITOR ACCOMMODATION


B1 SMALL RETAIL


B2 LARGE FORMAT RETAIL

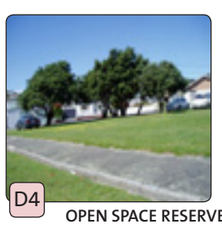

B3 OFFICE BUILDING


B5 INDUSTRIAL BUILDING

C1 AIRPORT


C2 PARKING


D2 RECREATIONAL OR CIVIC BUILDING


D4 OPEN SPACE RESERVES


D5 UTILITY

PRECINCTS 5,6,7

Precincts 5,6 and 7 are located on the west side of the airport. Reference is made to Part 1 (which describes the existing environment) and Part 2 which describes the range of potential land uses and evaluation criteria.

Precinct 5a

Precinct 5a is located at the south end of the airport and adjoins the Airport zone. The area has traditionally had industrial uses and the built environment is relatively large scale in terms of building footprints and the quality of the public amenity in respect of streets and public space is low. The amenity of the adjacent south Coast (Lyall Bay) is high. There are some constraints for traffic movements to this area from the State Highway network and arterial roads.

The flatness of the area, its relationship to the south coast, its large lot sizes and location relative to the airport suggest a range of potential future land uses. There is evidence of new large format retail activities in the land to the east and there are known proposals for increasing the retail development within this precinct by current landowners/lessees.

Sound exposure is in the L_{dn} 60 - 70 dB range. Strategically the area has been identified as a work area by Wellington City Council in its Suburban Centres review. This would allow for residential uses as Discretionary Activities. Because it is within the ANB residential uses are excepted from compliance with new noise standards ($D_{nT,w} + C_{tr} > 30$ dB) for any habitable room within the building. The current noise provisions for properties within the ANB continue to apply here. The WIAL draft Master Plan suggests some commercial development within the precinct in the future.

In considering the potential land uses for this precinct the potential for residential activities appears limited, although possibly visitor accommodation close to the coast, or higher residential density would be conceivable. The challenge for these forms of land use will be getting close enough to the coast to benefit from the amenity it provides to balance the 'robustness' of the old industrial legacy in the rest of the precinct. Although this could change over time, the move to large format retail is unlikely to be conducive to encouraging quality residential (including visitor accommodation) if the new retail follows the nature of that recently added to the area. Given the challenges to residential in this location from the work area zoning and the above factors, the most appropriate future use appears to be business - probably retail, office and the current industrial with possibly airport related activities also. Car parking associated with these activities is also likely. The work area zoning proposed for this precinct will attempt to manage the scale of retail activities and their effects, such as for transport and traffic movements, as well as urban design considerations.

These types of commercial activities will present low risks for noise conflicts. However, the potential for improved public amenity from these forms of uses will be less likely to be achieved than that of a mixed use approach.

The recommendation for land uses in Precinct 5a is Land Use Options B1, B2, B3, B5 and C1, C2 and D4. The proposed provisions for noise sensitive activities consistent with non-ANB live/work areas, and work areas are recommended to apply.

Precinct 6a

Precinct 6a sits immediately contiguous with the west side of the airport. The land uses here are residential with generally older houses, small sites and a relatively flat topography. These properties are all within the high range of sound exposure within the ANB being > L_{dn} 75 dB. Bridge Street itself is used as a transport route from the State Highway 1 and work areas of Precinct 7 through to Rongotai.

The WIAL draft Master Plan identifies these Precinct 6a properties for use as car parking - many of the properties are already in WIAL ownership.

The options for these properties in terms of land uses are particularly constrained by the high noise levels. There are also constraints given the height restrictions associated with the Control Tower and the Obstacle Limitation Surface (OLS). The high noise level effectively eliminate any continued use for residential activities. The adjacency to the airport provides a good opportunity for the airport to take over these residential properties for its own operations. Care will be needed with the way in which this Precinct is transitioned to ensure that the opposite residential properties on Bridge Street are not adversely affected by the change in use. Although the airport has signalled the land's use for car parking there are potential visual and increased traffic effects to be considered.

The potential for the land to accommodate office type activities or commercial activities could be considered appropriate, although this should be considered relative to the future of Precinct 6b as discussed below. In conjunction with the removal of a substantial number of residential uses from Bridge Street there is also opportunity to consider the development of this street as a redesigned higher volume transport route from the north to the south of Rongotai - this would require new connections to be made at the north end to Cobham Drive and for the south end link geometry to Tirangi Road to be determined. As discussed below there are implications for Precinct 6b from such a change.

The recommendation for land uses in Precinct 6a is Land Use Options C1, C2 and D4 with the potential in the future for "B" types. It is recommended that those residential properties which are within the > L_{dn} 75 dB sound exposure contour are acquired and decommissioned for residential uses.

It is also recommended that the land required by the airport for the draft Master Plan is rezoned to Airport.

Precincts 6b and 6c

The properties in Precincts 6b and 6c are similar in that they are typically on the east facing slopes of the ridge that separates the airport from Kilbirnie. A small number of properties in Precinct 6c are over the ridge facing west to Kilbirnie.

The properties are predominantly residential and the site sizes building types and values reflect this. The noise levels are highest in Precinct 6b where it adjoins Bridge Street and there is a group of properties at the north end which are in the > L_{dn} 75 dB sound exposure contour.

As noted in the evaluation of Precinct 6a the properties on Bridge Street have a lower level of amenity than the residential properties that are high in elevation or in a less shaded location.

The topography is a limiting factor for any larger scale commercial activities and these would also generate adverse effects for the residential amenity of the area. However, on the lower land on Bridge Street itself there is the potential to consider in the longer term the transition to commercial activities with visitor accommodation that would conceptually link the north and south work areas via an improved Bridge Street road design to connect at each end to the highway in the north and local road network in the south. This would address the higher noise levels that exist for the properties on both sides of Bridge Street.

For the residential properties higher up the slope, especially those over the ridge facing Kilbirnie there is a good aspect and potential over time for incremental property redevelopment for the existing residential purposes. However, on the higher properties there are relatively high sound exposure levels shown within the ANB.

There are no particular strategic influences from WIAL or Wellington City Council for the subject precincts.

The recommendation for land uses in Precincts 6b and 6c is Land Use Option A1 in combination with both improved noise insulation District Plan rules for noise sensitive activities, as well as encouraging insulation improvements for existing property owners. It is further recommended that those residential properties which are within the L_{dn} 75 dB sound exposure contour are decommissioned from residential uses.

Precinct 6d

Precinct 6d is a small area contiguous with the airport. The potential future uses are airport and or commercial related activities. The WIAL draft Master Plan shows these properties (about half of which are owned by WIAL) as transitioning to airport related uses. To facilitate this change, as with Precinct 6a and on the other side of the airport in Precinct 3a, the options are to recognise this by a change of zone to Airport. Alternatively the zone remains as residential and residential development will need to managed using noise standards (to limit future residential development). Whichever path is chosen the expectation is WIAL will eventually acquire these properties on a willing seller basis.

This management option is not considered as appropriate as an Airport zone type as the residential zoning will provide less effective guidance for the management of non -residential activities for location such as this. There are recognised potential effects for the existing residential landowners in this precinct from such a change of use and the effects on the other residential properties in the area will also need to be considered.

Provided the noise generating characteristics of any new activity in this precinct are not increased then the noise impacts for the wider residential area from the change of use should not increase. The effects in terms of the scale of building development and the associated movement of traffic will need to be considered in any rezoning proposal and the associated urban design requirements.

The recommendation for land uses in Precinct 6d is Land Use Options C1, C2 and D4 with the potential in the future for "B" types. It is recommended that those residential properties which are within the > L_{dn} 75 dB noise contour are acquired and decommissioned from residential uses.

It is also recommended that the land required by the airport for the Master Plan is rezoned to Airport.

Precinct 7a

Precinct 7a at the north end of the ANB and is predominantly a Suburban Centre and moving to live/work for the western area and work area on the eastern area side closest to the airport under the zone review. There is an area of residential and community services (fire station) within. The land is flat topographically and at its north side adjoins to Cobham Drive where there is an outlook to Evans Bay. The lot sizes are typically large except for the residential uses.

A large area in the west corner is playing field although it has a Suburban Centre zoning (moving to live/work area) and is earmarked for a new indoor sports stadium. This stadium will occupy all of the area within the ANB of this western most Suburban Centre effectively eliminating the noise sensitivity of this part of the Precinct.

Strategically the expectation from the zoning review is that the area closest the airport would retain its current uses as a light industry/commercial enclave. The area which is towards Kilbirnie may move to a mixed use of living and working type activities. Only part of this western most live/work area is within the ANB.

The high noise levels in the area of Precinct 7a close to the airport suggests that the current uses are appropriate and should continue. As noted above for the Precinct 6 there is the opportunity to connect this area to the south via a new Bridge Street link which may best connect through Precinct 7a to Cobham Drive, potentially via Tacy Street or the existing roundabout.

The western most part of Precinct 7a contains residential activities currently and these are expected to remain. However, the option of these properties transitioning to some other form of use of a commercial nature is possible as they may be affected by the proposed indoor stadium and the 'zone of influence' this generates. The current zone is residential for these residential properties and a change to a more commercially friendly zone would be expected to precede any major shift in land uses here.

The recommendation for land uses in Precinct 7a is Land Use Options A1 for the existing residential properties, B3 and B5 as well as recognition of the community facilities with type D2 (stadium) and D5 (fire station) in combination with both improved noise insulation District Plan rules for noise sensitive activities, as well as encouraging insulation improvements for existing property owners.

IMPLEMENTATION ACTIONS

The recommendations for land use changes and management from the evaluation form the primary direction for actions from LUMINS. To implement these directions for change there are a range of measures proposed. These are interlinked and will require detailed consideration and interaction with other parties - especially Wellington City Council. An outline of the implementation measures and strategy behind these is set out below.

Alignment with Strategies and Plan Changes

There are several concurrent Wellington City Council urban planning strategies and specific District Plan changes in train in parallel with LUMINS. The residential development and suburban centre District Plan changes are particularly relevant for consideration. Consideration should be given to:

- the retention and support for the proposed Suburban Centre policy for noise management in live/work areas where some residential development is considered appropriate (Precinct 1c)
- consideration as to the application of the proposed Suburban Centre review noise standard ($D_{nT,w} + C_{tr} > 30/35$ dB) as a more appropriate basis for all new noise sensitive activities within the ANB (see comment below)
- recognition in the Residential Area review (or a subsequent Plan Change process) of the need to manage noise standards for alterations and additions that add new habitable rooms
- recognition in the Residential Area review (or a subsequent Plan Change process) of the need to improve the definition of noise sensitive activities to better reflect the actual situation
- the specific design guidelines for the Residential Area review responding to the particular noise generating issues within the ANB and other noise sensitive locations (they mention noise sensitive internal areas, but perhaps could add external spaces too?)
- rezoning by Plan Changes for the current Residential Areas (Precinct 6a, 6d and part of 3a) to Airport to recognise the WIAL Master Plan.

District Plan Noise Standards - New Development

There are two different types of noise insulation standards that apply in the District Plan - that which applies within the Port Noise Affected Area and Central Area and is proposed for Suburban Centres as part of the review ($D_{nT,w} + C_{tr} > 30/35$ dB as noted above); and those which specify internal noise criteria for habitable rooms in the Residential Areas

There is an opportunity for new buildings and alteration and additions to be insulated to a higher standard and accordingly there is some sense in applying $D_{nT,w}$ standards across the Residential Area overlaid by the ANB (as well as the Suburban Centres) for any new noise sensitive activity (this includes by definition dwellings - see also note above) as this enables the construction to be appropriate to obtain an internal noise at L_{dn} 40 dB within a new dwelling, assuming the external noise is no greater than L_{dn} 75 dB. The aim remains to obtain the healthy internal noise standard, but the means to achieving this is clearer with the $D_{nT,w}$ approach in combination with the internal noise requirement. There may be a need to consider an additional L_{max} internal level for bedroom spaces to recognise that maximum noise above 55 dB may cause sleep disturbance (this was the approach adopted in the Corrigan case).

High Noise Locations

There are several locations where the sound exposure exceeds L_{dn} 75 dB. These are marked in yellow on the figures for each precinct (Precincts 4a, 6a, 3a). For these properties effective insulation to an internal level for existing residential buildings will be difficult to achieve. It is recommended that these properties are purchased in time and their residential use be terminated.

Insulation of Existing Noise Sensitive Activities

There remains the need to address the impact of sleep disturbance and amenity for residents of existing dwellings, and internal educational facilities inside the ANB. It is recognised that given the practicalities facing retrofitting existing homes, L_{dn} 45 dB is an acceptable internal standard. In general the recommendations for land use are that the existing Residential Areas would remain in use as such, except for the high noise locations as described above. The costs for insulating existing residential properties within the ANB to L_{dn} 45 dB have been estimated at between $23 and $28 million (not including acquisition of the very noisiest properties which is an additional $11.7 million).

Where properties within the ANB are in the less noisy locations there is better potential for insulation in a cost effective way. For those properties for which insulation is an option to mitigate airport generated noise effects it is recommended that a strategy for insulation be developed that:

- provides a scaled package for insulation which is reflective of the noise conditions that are projected for the future
- is strategically linked to the current Government energy efficiency insulation package
- considers some form of incentive to property owners undertaking additions and alteration of habitable rooms, or new dwellings to meet higher standards of acoustic insulation
- is administratively linked to Council Building Consent processes to enable records to be kept for LIM reports
- reflects in the timing of its implementation any District Plan change process
- is communicated overtly to all existing residential landowners as well as other noise sensitive activities as defined by the District Plan
- provides for insulation of educational facilities to an internal standard of L_{dn} 40 dB

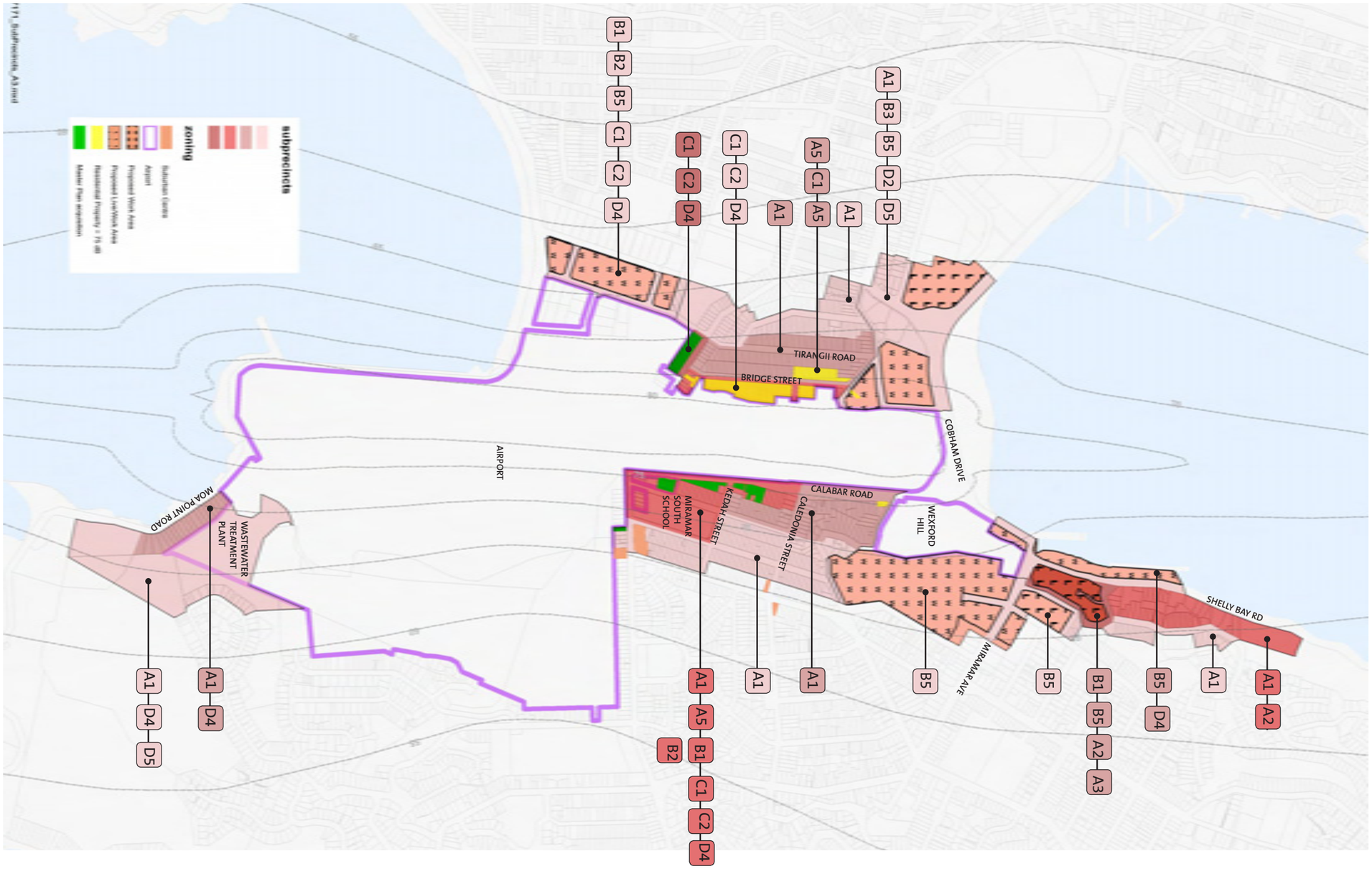
Airport Zone Changes

A key implementation method for the strategic direction for the airport as embodied in the Master Plan is the District Plan. It is recommended that for the areas shown for the airport extension that changes to the current Airport zone footprint are sought together with appropriate provisions to manage the effects of the Master Plan development proposed. The recommendation set out for the various precincts recognise that as part of such a rezoning some specific urban design qualities will need to be sought and these to can be provided for by way of an outline concept to accompany the zone changes together with some specific design guidance.

Multi-agency involvement and investment

There are two principal locations where there is an opportunity for change to the currently public infrastructure to benefit the city. These are the road connections either side of the airport. On the west side there is the potential to provide an improved north/south link between Cobham Drive and Rongotai by utilising Bridge Street. This would require property acquisition at the north end and Wellington City Council, New Zealand Transport Agency (Cobham Drive being State Highway) and WIAL involvement to advance with a collective approach.

On the east side the current issues of transport access to the airport can be improved through the redevelopment of the land in Precinct 3a in conjunction with redevelopment of the road carriageway for improved modal function (ie road, plus bus, cycle) and amenity. As the first and last experience of the city for many visitors to Wellington this road has poor visual amenity and can be significantly enhanced. As on the east side, this will require Wellington City Council, New Zealand Transport Agency (Cobham Drive being State Highway) and WIAL involvement to advance with a collective approach. This will need to be considered in conjunction with planning for the remainder of Precinct 3a and any extension in Airport zone as described above.



COMPOSITE LAND USES OPTIONS PLAN

GLOSSARY OF NOISE TERMS

dB A measurement of sound level which has its frequency characteristics modified by a filter (an A-weighted filter so as to more closely approximate the frequency bias of the human ear).

L_{eq} The time averaged sound level (on a log/energy basis) over the measurement period (normally A-weighted).

L_{dn} The day-night sound level which is calculated from the 24 hour L_{eq} with a 10 dB penalty applied to the night-time (2200-0700 hours) Leq (normally A-weighted).

L_{max} The maximum sound level recorded during the measurement period (normally A-weighted).

$D_{nT,w} + C_{tr}$ The standardised level difference (outdoor to indoor) and is a measure of the airborne sound insulation provided by the external building envelope (including windows, walls, ceilings and floors where appropriate)

REFERENCES

LUMINS Stage 1 Summary Report

Colmar Brunton, (2008). "Wellington International Airport Sound Abatement Survey."

Malcolm Hunt, (2008). "Lumins Stage 2 Educational Facilities Acoustic Insulation Assessment."

Rider Levett Bucknall (2007). "Wellington International Airport Estimate of Cost Report for Airport Noise Study LUMINS Stage 2 Acoustic Assessment New Houses."

Rider Levett Bucknall (2007). "Wellington International Airport Indicative Order of Cost Report for Noise Study (LUMINS)."

Wellington City Council, (2000) "The Wellington City District Plan."

Wellington City Council, (2006). "Urban Development Strategy."

Wellington City Council, (2008). "Ngauranga to Wellington Airport Draft Corridor Plan."

Wellington City Council, (2008). "Centres Policy."

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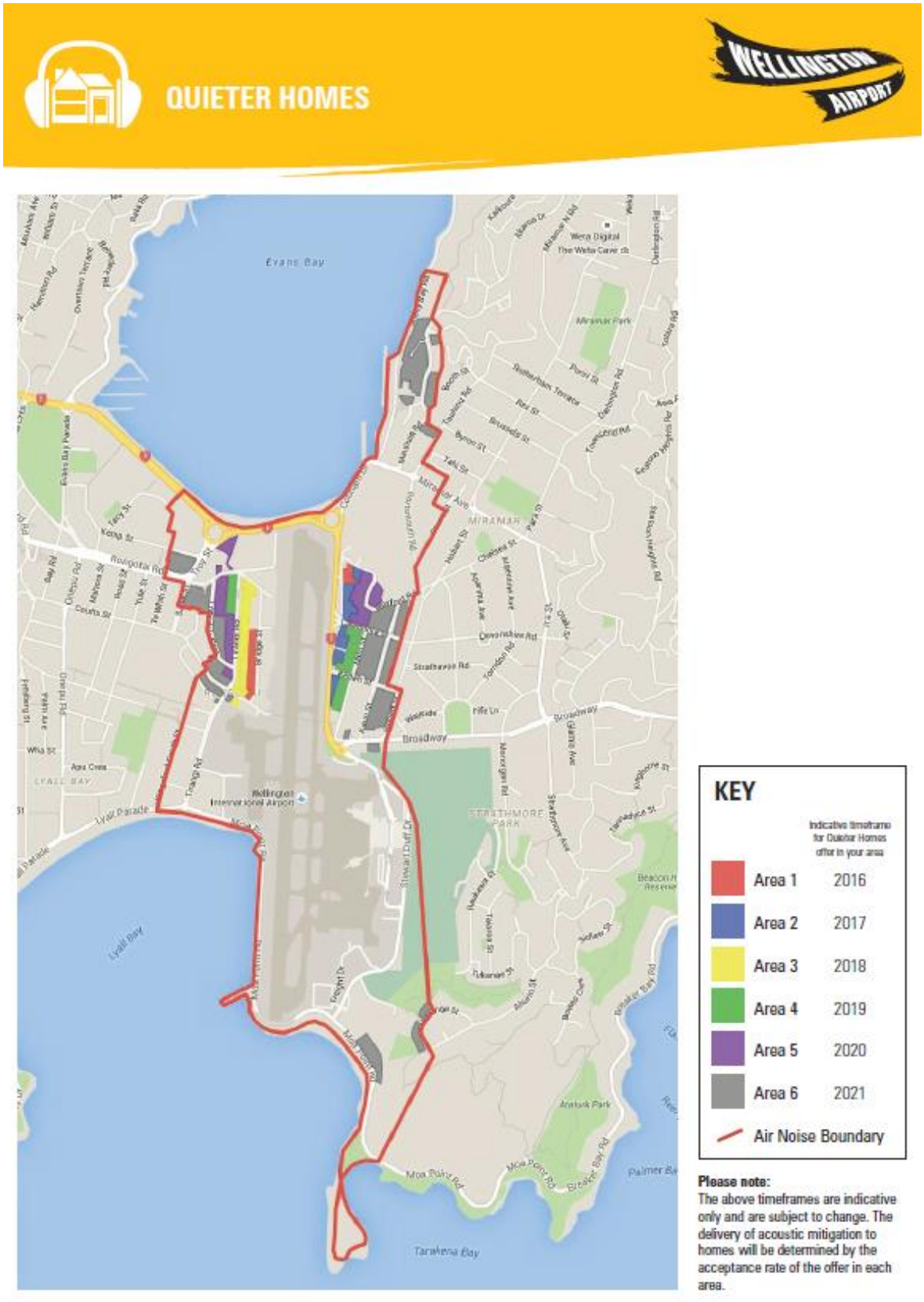
New Zealand Standard 6805:1992. Airport Noise Management and Land Use Planning

New Zealand Standard 6807:1994. Noise Management and Land Use Planning for Helicopter Landing Areas

New Zealand Standard 6809:1999. Acoustics - Port Noise Management and Land Use Planning

5.3 Quieter Homes Phased Roll Out (by area)



PART D

Review and Consultation Procedures

NOISE MANAGEMENT PLAN: MONITORING & REVIEW

The 1997 Environment Court Consent Order and the Wellington City Council District Plan require that the Noise Management Plan (NMP) includes procedures for it's ongoing monitoring and review. Accordingly these are set out below.

The Wellington Air Noise Management Committee (ANMC) is the body primarily responsible for the NMP. However the day to day upkeep of the NMP is delegated to the Airport Planner at WIAL.

The Airport Planner shall be responsible for ensuring the NMP is kept up to date with decisions of the ANMC, changes in legislation, standards etc. Accumulated changes shall be disseminated quarterly to all holders of the NMP, and recorded in the changes register, held in the Master Copy of the NMP.

Any changes to the District Plan that necessitate major changes to the Noise Management Plan may constitute grounds for a complete review and restructure.

A thorough review of the NMP including all changes made shall be carried out once every 5 years. This will determine the effectiveness of the NMP in meeting principally District Plan Objective 10.2.5 and Policy 10.2.5.4 (from which the NMP is derived), and also ensure that the cumulative effect of incremental changes does not result in a significant deviation from the NMP's core purpose.

The 5 yearly review shall be carried out by an independent body, under the direction of the ANMC.

2. Wellington ANMC Terms of Reference

Mission

As a partnership between airport, operators, and the local community, provide assistance and advice to WIAL in its preparation and implementation of a noise management plan for Wellington Airport that will assist the relevant parties in complying with the objectives and rules of the District Plan.

Principal Roles

Monitor the aviation industry's compliance with the rules as contained within the Wellington City District Plan, and other regulatory instruments.

Monitor WIALs compliance with the rules of the District Plan and the regulatory agencies' enforcement regime.

Provide an open and consultative forum for:

- Exchange of information between parties
- Discussion and recommendations on requests for exemptions/waivers

WIAL will consult the Committee on:

- Acceptable protocols for measuring and reporting noise impact, including complaints procedure
- Mechanisms for reducing or mitigating the adverse effects of airport noise
- Specifications, selection and location of noise monitoring equipment
- Best practice from overseas jurisdictions

In support of these roles -

WIAL will provide:

- Secretarial and support services
- Updated activity reports on aircraft movements, curfew etc
- Updated reports on system quality checks
- Technical reports on system development
- List of complaints and correspondence

WCC/WIAL:
Updated noise exposure reports from the noise monitoring system in a manner which is readily understood by outside observers

Aircraft operators will provide:
Updated activity reports on engine testing

Residents' representatives will provide:

- List of related correspondence and complaints which arise through their networks
- Communication of Committee decisions through their networks as required.

Airways Corporation New Zealand will provide:
Information and advice on the Air Traffic Services, and aircraft operations

All parties will provide:
Information gathered through networks on relevant best practice in overseas airports

A technical working group/subcommittee ~~is~~ may be established to work on and report to the main committee on technical issues.

Membership

- Residents' representatives [FOUR]
- BARNZ
- Local non-BARNZ operators
- ACNZ
- WIAL
- WCC
- Technical advisor
- NZ Defence

Residents' representatives

Length of term: Three years*

* Term to align with Local Government election cycle

Representation areas (refer Figure 1)

- Air Noise Boundary east – ONE Residents' representative
- Air Noise Boundary west – ONE Residents' representative
- Wider airport community (WCC Eastern Ward) – TWO Residents' representatives

Call for nominations for representative(s) from each of the above areas:

- Advertise for nominations
  - Public notice in Cook Strait News and Dominion Post
- Letter to all current Community Associations
- Nomination form and election procedure made available on WIAL website

Election procedure (where more than FOUR nominations are received):

- Postal vote to WCC Eastern Ward residents
- WCC Returning Officer appointed in accordance with WCC electoral policy

Representative attendance policy:

- The Representatives are required to attend scheduled meetings of the committee
- After three consecutive absences a Representative is considered to have resigned from the Committee, unless the Committee finds extenuating circumstances.
- Where there are fewer than THREE Representatives on the Committee, the next highest polling nominee will be appointed to the Committee.

Quorum

Representatives from:

- Residents
- WIAL
- BARNZ
- WCC

Method of conducting business

The Committee has an objective to reach consensus on issues, but dissenting views will be recorded.

Where issues fall within the jurisdiction of a particular organisation with the responsibility to make the final decision, it shall do so. For other matters where no particular organisation has the mandate to make the final decision the Chairperson shall determine whether consensus has been reached and any dissenting views shall be recorded.

Figure 1: ANMC Residents' Representation areas

Air Noise Boundary east

Air Noise Boundary west

Wider airport community (WCC Eastern Ward)

WELLINGTON AIR NOISE MANAGEMENT COMMITTEE

DISPUTES RESOLUTION

Wellington International Airport Limited (WIAL) is committed to a process whereby differences between the parties represented on the Air Noise Management Committee are resolved within the Committee through the provision of information, analysis, consultation and the development of a consensus.

WIAL recognises however that there may be occasions where a consensus does not emerge in an area where a decision is required. In the first instance the difference will be noted, but, if in the view of the Committee it is essential to resolve the difference the following applies:

1. WIAL accepts that it is the prerogative of the Chairperson of the Wellington Air Noise Management Committee (WANMC) to determine that a point of difference exists and that the Chair may endeavour to resolve the issue within the Committee acting as mediator.

2. To facilitate mediation WIAL will provide the Chair at its cost with whatever information and advice the Chair considers is reasonably necessary including if required a legal opinion on the issue or aspects of it, on the basis that the information and advice will be made available to the members of the WANMC.

3. If despite best efforts (including independent mediation if the Chairperson so chooses) a consensus cannot be reached within the WANMC, the appropriate body making the decision will consider any recommendation on the issue in dispute that the Chairperson may make and will formally advise the Chairperson within 10 working days of its decision in respect of any such recommendation and the reasons for its decision.

Appendices

1. The Language of International Civil Aviation (ICAO)
    - 1.1 Aircraft noise
    - 1.2 Environmental issues in civil aviation

2. ICAO International Standards and Recommended Practices: Environmental Protection: Aircraft Noise (Annex 16)

   http://cockpitdata.com/Software/ICAO%20Annex%2016%20Volume%201

3. Airports Council International (ACI) Policy Handbook

   http://www.aci.aero/Publications/Full-Publications-Listing/ACI-Policy-and-Recommended-Practices-Handbook-8th-edition-2016

4. Resource Management Act 1991

   http://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html
    - 4.1 s16 Duty to avoid unreasonable noise
    - 4.2 s31 Functions of territorial authorities under this Act
    - 4.3 s338 Offences against this Act
    - 4.4 s9 Restrictions on use of land

5. New Zealand Standards (only included in Master Copy)
    - 5.1 NZS6801:1991 Measurement of Sound
    - 5.2 NZS6805:1992 Airport Noise Management and Land Use Planning
    - 5.3 The Making of a Standard
    - 5.4 NZS6807:1994 Noise Management and Land Use for Helicopter Landing Areas