Latrobe Regional Airport
Strategic Development Plan Report

Latrobe City Council

Final Draft

February 2021

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1 Introduction

The methodology for this project has been informed by the vision statement that was adopted for the 2019 Latrobe Airport Master Plan.

"To promote the development and expansion of the Latrobe Regional Airport as a regionally significant airport providing a hub for aviation services and employment thereby adding economic and social benefit to the region, whilst maintaining options for future transport services."

The key objectives of this study have been**:**

- Defining a development pathway for Latrobe Airport that considers development opportunities, timing and readiness;
- Identifying how the development opportunities can be unlocked on an airport where land resources and connectable infrastructure exist and where there are few barriers such as adverse land conditions or inherent environmental conditions such as flooding;
- Definition of precincts for development and identifying compatible land uses within these precincts;
- Providing more clarity around current land uses and tenancies, and whether these provide the highest and best value for the airport in their current location;
- Definition of 'value' – what airport activities are considered to be high, medium and low value and are these impacting best land use going forward;
- Identifying roadblocks to development and investigating how these can be removed and / or ameliorated;
- Define development opportunities for Latrobe airport in relation to the precincts both in terms of land use and value to the airport;
- Identify if the Civil Aviation Safety Authority (CASA) 2020 Manual of Standards (MoS) changes relating to runway strip widths and clearances have unlocked additional land resources on the airport;
- Safeguarding for future aeronautical developments;
- Define in more clarity, future planning for each precinct considering potential land block sizes, road and airfield access, height controls, and relationship to the airfield and aircraft parking aprons;
- Develop staging plans for immediate development, 2-5, 5-10, and > 10 year periods. Land for immediate development will be that adjacent to existing roads and connected to existing services.

The outcomes of the project have been to develop plans that can act as a roadmap for future development.

2 Existing Condition

2.1 Location

Latrobe Regional airport is owned and operated by the Latrobe City Council. It is located just to the north of the Princes Freeway and adjacent to the Latrobe Regional Hospital. It is roughly equidistant to the major centres of Morwell and Traralgon. The airport site has an area of approximately 166.8 hectares.

The main airport access is by Airfield Drive to the east. Secondary access to the airport site is via Village Avenue and Valley Drive. Old Melbourne Road forms the boundary to the north of the airport. The airport site is shown below.

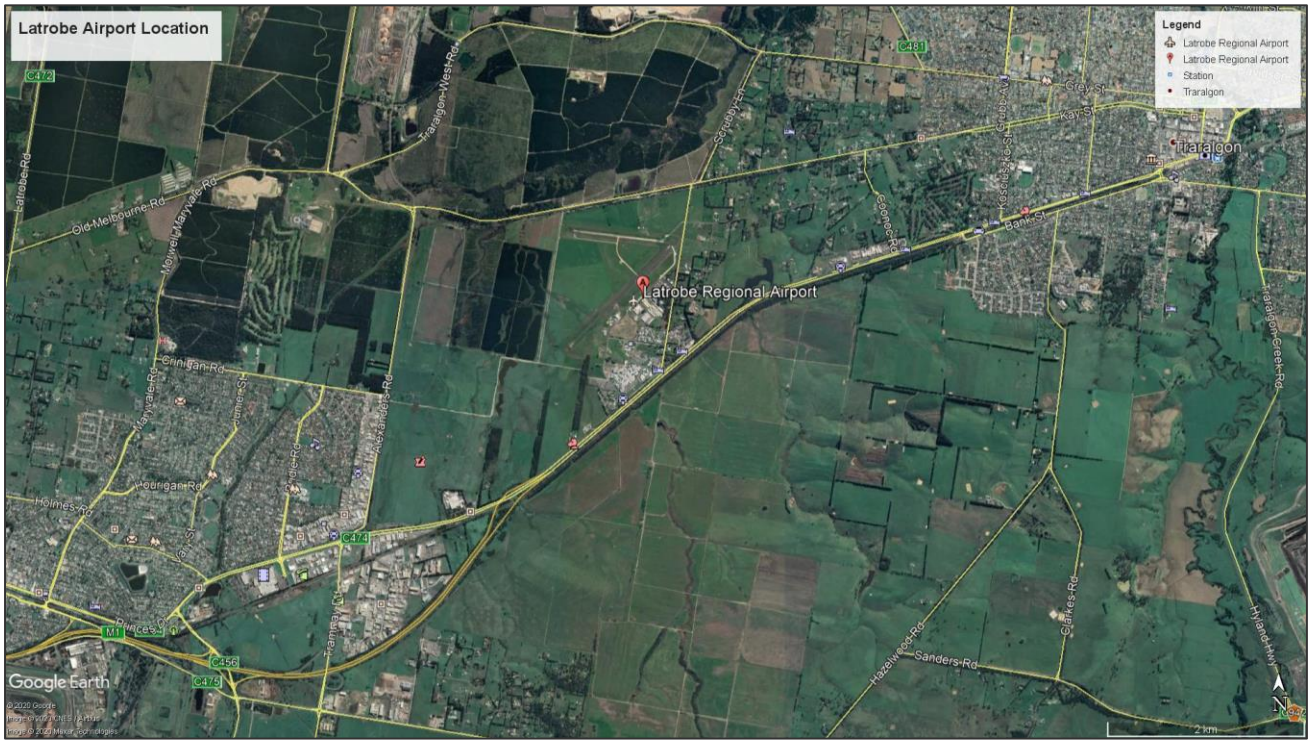

Figure 2-1: Latrobe Airport Location

2.2 Airfield and Runway

The main airfield and runway features of the airport are as follows:

- Runway 03/21 is the main runway for the airport. It has a sealed runway which is 1,430m long, 23m wide and has a 90m runway strip.
- Runway 09/27 is the cross runway to 03/21. It is a gravel strip, 919 metres long by 18 metres wide and has a 90 metre runway strip.
- There is also a 500 metre long glider strip that is intermittently used.
- All taxiways are Code B except that linking the runway to the Terminal Apron – this is Code C.

There were previous RPT operations (operated by Hazelton Airlines) at the airport using SAAB A340 aircraft. These are Code C aircraft that operated under a CASA dispensation. It is believed that this dispensation may be grandfathered.

However, should any 'substantial' works (such as lengthening or widening) be undertaken to the runway, then this would remove the grandfathering and full compliance to current CASA MoS standards would be required.

It is worth noting that CASA are now disinclined to provide any dispensations.

The AirServices En Route Supplement Australia (ERSA) Aerodrome Information Package (AIP) for Latrobe Airport is shown below.

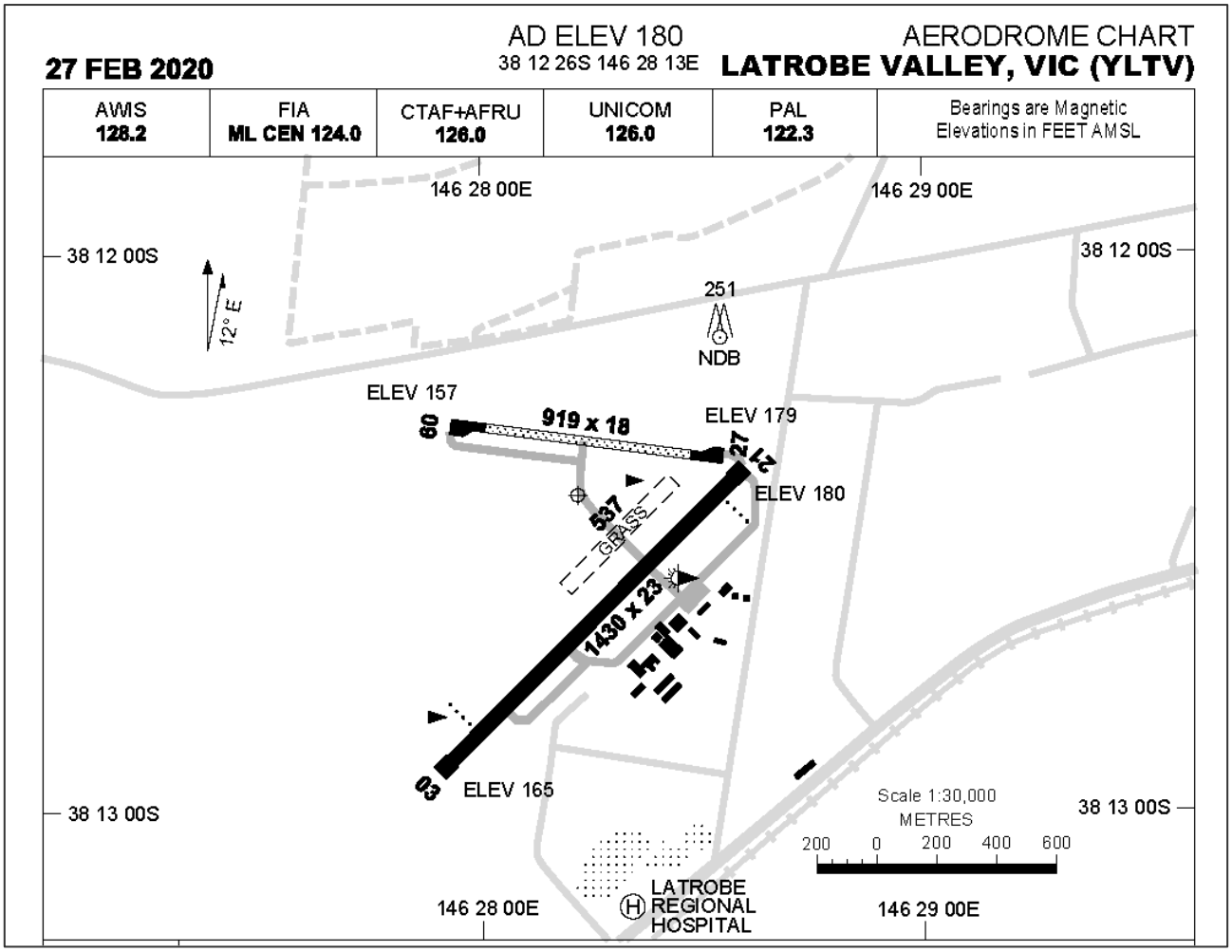

Figure 2-2: Latrobe Airport AIP[1]

2.3 Land Use

Latrobe Airport is primarily a General Aviation (GA) airport though there have been RPT services operating from the airport in the past.

The primary land uses are:

- Terminal building and associated parking area;
- Gippsland Aero Club;
- Aviation museum;
- Aviation businesses – including Mahindra (aircraft manufacturing) and East Coast Aviation (aircraft maintenance and repair);
- Private hangars;
- Government and emergency services. This includes:
    - Country Fire Authority (CFA) fire station;
    - State Emergency Service (SES) base;
    - Department of Environment, Land, Water and Planning (DELWP) aircraft base;
    - Helicopter Emergency Medical Service (HEMS) facility. This is the base for the ambulance helicopter that serves the Latrobe hospital, also known as HEMS 2;
    - Royal Australian Air Force (RAAF) Air cadets.

Most of the active land uses are concentrated in the Central Core located to the east of the airport on the Airfield Road boundary.

[1] https://www.airservicesaustralia.com/aip/current/dap/LTVAD01-162_13AUG2020.pdf

There is also an area designated for environmental purposes adjacent to the Airfield Road boundary.

Much of the land on airport is underutilized and/ or vacant. Some of this land has direct road and airfield access available.

Existing land uses are shown below and in Appendix A.

Figure 2-3: Existing Airport Land Uses

Figure 2-4: Central Core Land Use

3 2019 Master Plan

The Strategic Development Plan that has been developed builds on the Latrobe Airport Master Plan that was finalised in 2019. The Latrobe Regional Airport Master Plan is self-described "*as a foundation to underpin all activities and decisions of the Latrobe Regional Airport Board and Latrobe City Council*". The overall aim of this review is to revise the current 20-year Master Plan for Latrobe Regional Airport in order to revitalise the airport. The principal objectives for the Latrobe Regional Airport Master Plan 2015 (Updated 2019) are that it should:

- Set the vision for the Latrobe Regional Airport to 2035 and beyond, including the key market opportunities that should be pursued to achieve the vision;
- Clarify the positioning work that needs to be undertaken in order for the Latrobe Regional Airport to achieve its vision including processes and timing that need to occur;
- Link into the strategic context of Latrobe City Council and its objective of the Latrobe Regional Airport as a key employment zone. At a more detailed level, the objectives of the review include a desire to:
- Review and revise the existing Latrobe Regional Airport Master Plan 2009 as identified within the Latrobe Planning Scheme's Local Planning Policy Framework (LPPF);
- Review the current vision statement and develop a revised Master Plan for the sustainable development of the airport and its environs that will guide future growth of associated industries and business at the Latrobe Regional Airport over the period;
- Assess the success of the current business model under which the Latrobe Regional Airport operates;
- Identify future growth and business development opportunities at the Latrobe Regional Airport, highlighting community benefits and opportunities while providing direction for diversity in business and industry at the Latrobe Regional Airport;
- Identify marketing opportunities that will attract aviation businesses and achieve a critical mass that will ensure the continued development of a recognised aviation/aerospace hub at the Latrobe Regional Airport;
- Review the land tenure model (leasehold, premium leasehold, freehold) to ensure it remains relevant;
- Review existing land use planning and development controls applicable to the Latrobe Regional Airport and its environs and identify any necessary amendments to the Latrobe Planning Scheme where required to support the objectives of the revised Master Plan;
- Review existing and future Obstacle Limitation Surfaces (OLS) areas together with Procedures for Air Navigation Systems – Aircraft Operations (PANS-OPS) surfaces and the Australian Noise Exposure Forecast (ANEF) mapping applicable to the Latrobe Regional Airport and verify their incorporation within the appropriate provisions of the Latrobe Planning Scheme;
- Prepare Development Guidelines for the Latrobe Regional Airport to ensure an attractive and sustainable built form of new development. The Development Guidelines will facilitate the ongoing useability, functionality and viability of the development precincts over the next 20 years;
- Consider future demand for Airport services in the context of projected demographic and economic changes in the region;
- Review relevant Commonwealth, State and Local government policy, and other relevant studies and strategies likely to be of significance to the future planning and development of the Latrobe Regional Airport; and
- Ensure that Latrobe Regional Airport Board, Latrobe City Council, key stakeholders and the community are fully engaged in the review and development of the Master Plan.[2]

The 2019 Master Plan identified five zones for the airport:

- **Terminal Zone:** The existing terminal, Latrobe Valley Aero Club, SES and CFA facilities, private hangars, Latrobe Flying Museum, some commercial operations and the landscape conservation zone.
- **Central Business and Employment Zone:** Currently occupied by Mahindra Aviation, HEMS 2, and DELWP base. There is still development scope in this area.

[2] https://www.latrobe.vic.gov.au/sites/default/files/2020-04/2019%20Airport%20Master%20Plan.pdf

- **Southern Business and Employment Zone:** Minor development has occurred in this area and there is significant scope for development.
- **Northern Business and Employment Zone:** Currently undeveloped.
- **Recreational and Events Zone:** Currently undeveloped.

There were additional areas identified for 'Future Development' that have not had uses identified for them. The extent of the large zone to the west cannot be fully defined until the future runway configuration is determined.

A major component of the Master Plan was safeguarding for future aeronautical development. This included provision for:

- Extension of Runway 03/21 by 150 metres to 1,580 metres;
- Provision of a new 1,680 metre long runway west of the existing Runway 03/21; and
- Upgrading of additional taxiways to Code C.

This Strategic Development Plan agrees with these safeguards and they have been incorporated into the plan.

4 Strategic Development Plan

4.1 Key Aspects

The key aspects of the Strategic Development Plan that has been developed are:

- It builds on the Latrobe Airport Master Plan that has already been developed. Many aspects of the Master Plan have been incorporated into the Strategic Development Plan;
- There is a commercial focus to the development – the aim is to facilitate commercial development that will provide return to Latrobe City Council, and create jobs and opportunities for the Latrobe City and wider Gippsland community;
- Development is to be aviation related. Council stakeholders have indicated that there should be a clear preference for airport development (particularly commercial development) to have an aviation focus rather than more general development. Access to the airfield is an important aspect of all the proposed land development;
- Future aeronautical development has been safeguarded as part of the plan. This includes allowance for construction of a future runway and upgrading of taxiways for larger aircraft types. Upgrading of aeronautical assets will largely depend on any future introduction of sustainable Regular Passenger Transport (RPT) services; and
- Staging of development. Incremental growth is the driver for development stages – the aim is to align airport funded development with private sector development. This will ensure that Council funded investment and capital outlays are immediately or closely followed by private sector development.

4.2 Competitor Airports

Latrobe Airport is similar to four other airports in regional Victoria. These airports are:

- Bendigo (BXG/ YBDG)
- Ballarat (YBLT)
- Mangalore (YMNG)
- West Sale (YWSL).

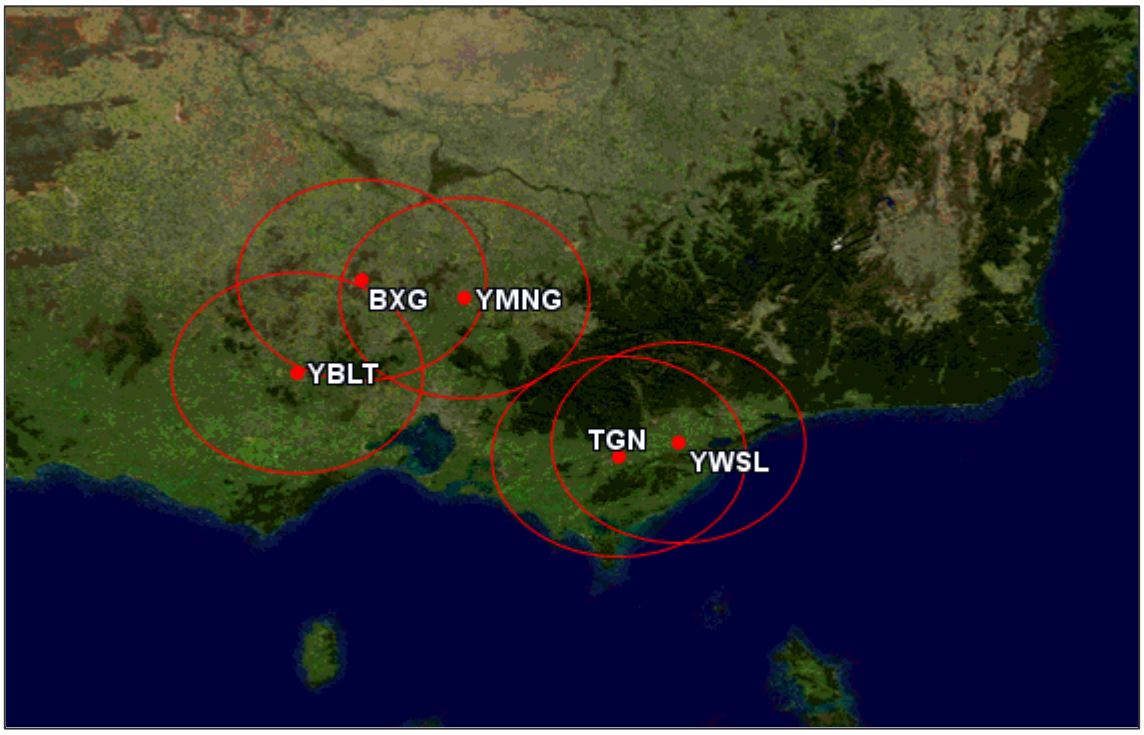

Figure 4-1: Victorian competitor airports showing 100km catchment radius

These airports have similarities to Latrobe such as:

- They are located in a radius from Melbourne that is between 100 and 200 kilometres;
- They are largely GA based airports (with the exception of Bendigo); and
- They have various levels of commercial development on site.

These airports could be classed as competitors to Latrobe in terms of attracting investment and possible RPT air services. The question is what differentiates them from Latrobe and each other, and what are the comparative advantages of each and what can Latrobe learn or otherwise.

The comparison issues that were investigated included:

- Aviation infrastructure;
- Overall land resource;
- Proximity to land transport infrastructure; and
- Catchment area.

Below is an overview of each of these airports.

4.2.1 Bendigo Airport

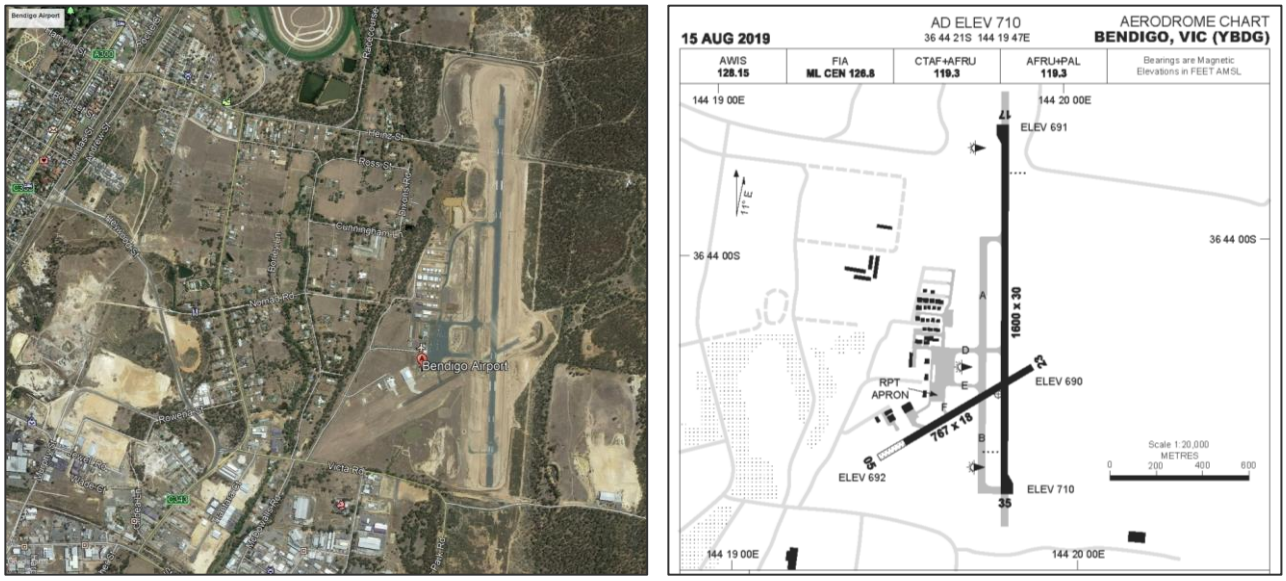

Figure 4-2: Bendigo Airport

Main features of Bendigo Airport are:

- The airport is located away from main roads and has only secondary roads for access;
- There are limited commercial opportunities due to limited land resources;
- Approximate land area of 140 hectares; and
- RPT services to Sydney were introduced in 2019.

4.2.2 Ballarat Airport

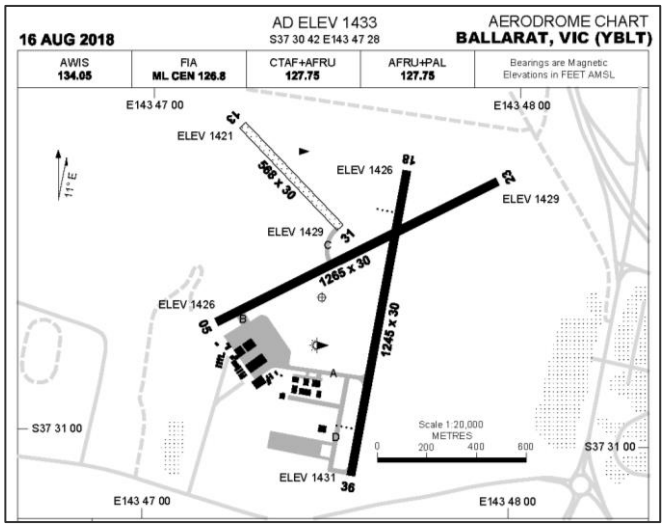

Figure 4-3: Ballarat Airport

The main features of Ballarat Airport are:

- There is a large airport land resource that is an extension of main Ballarat industrial development area;
- Additional land is currently being released. This is being developed as freehold land so in future would not be regarded as an airport land resource. This may also limit or constrain future airport development;
- Close connection to Western Freeway will facilitate major industrial development;
- Approximate land area of 261 hectares. Due to land sales being made, this area will reduce;
- A Regional Airport Grant was approved in 2020 for runway extension and strengthening. This is targeted at possible future RPT services and heavier gauge emergency services aircraft; and
- Of the airports assessed, Ballarat is the equal closest regional airport to Melbourne Airport, therefore it has a significant catchment overlap with Melbourne Airport.

4.2.3 West Sale Airport

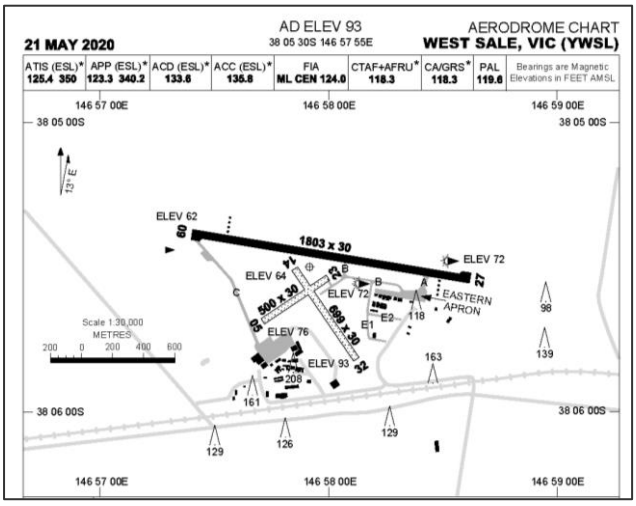

Figure 4-4: West Sale Airport

Of the airports that have been considered West Sale is the furthest regional airport from Melbourne. Other key features are:

- The airport has a largely undeveloped land resource with an approximate land area of 172 hectares; and
- The airport is located adjacent to the Princes Highway and the main Gippsland rail line.

4.2.4 Mangalore Airport

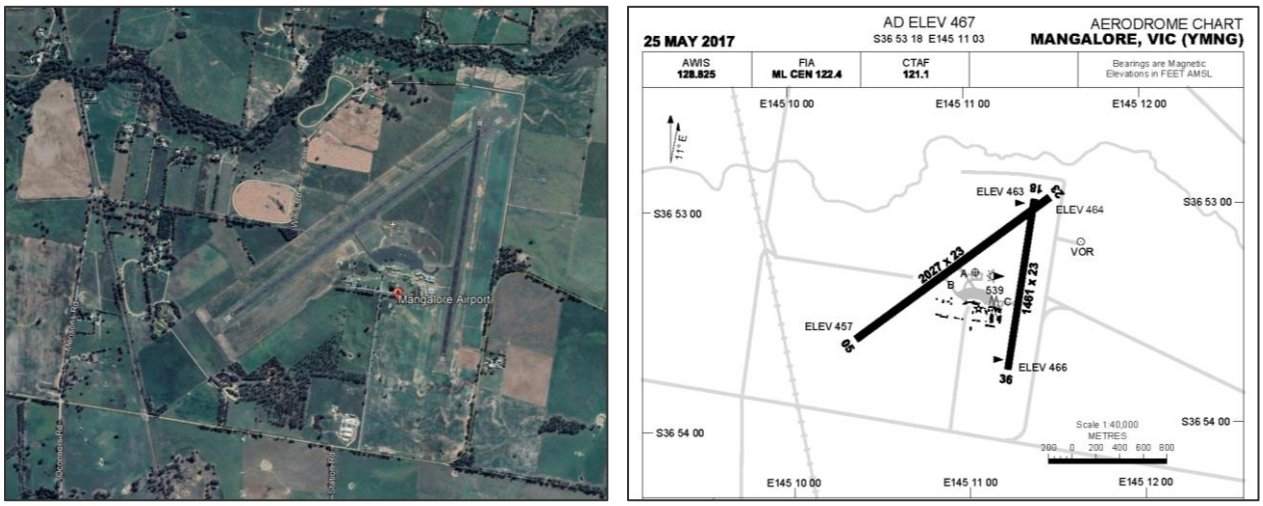

Figure 4-5: Mangalore Airport

The main features of Mangalore Airport are:

- It is the equal (long with Ballarat) closest regional airport to Melbourne Airport, therefore it has more catchment overlap;
- The approximate land area of Mangalore Airport is 172 hectares;
- It has a largely undeveloped land resource;
- The airport is equidistant to two freeways (Hume and Northern) but only local road access. Commercial development on airport would require significant road funding investment; and
- Unlike the other airports assessed, there is no large population centre that can act as catchment or as a labour resource for commercial development.

4.2.5 Comparison of Similar Airports

Table 4-1 below shows the comparative aspects of the competitor airports with each and Latrobe Airport. The major differentials assessed are:

- Distance in kilometres from Melbourne CBD and Melbourne Airport;
- Catchment radius from each airport and catchment population based on 2016 census figures. The areas excluded from each airport's catchment population are noted;
- Airport ownership type;
- Airport aviation infrastructure; and
- Airport land area.

		Latrobe	Ballarat	Bendigo	Mangalore	West Sale
Distance (km)	Melbourne CBD	158	125	159	130	206
	Melbourne Airport	184	117	142	117	232
Catchment Population[1]		193,572	169,085	144,053	116,615	183,685
Catchment Radius[2] (km)		80	80	80	90	100
Local Government Areas in Catchment		-Latrobe -Baw Baw -South Gippsland -Wellington	-City of Ballarat -Mooroobool[3] -Hepburn -Central Goldfields -Pyrenees -Golden Plains West -Ararat	-Greater Bendigo -Campaspe -Mount Alexander -Loddon	-Mitchell North -Greater Shepparton -Benalla -Strathbogie -Mansfield -Murrindindi	-Wellington -South Gippsland -East Gippsland[4] -Latrobe
Ownership		Local Govt	Local Govt	Local Govt	Private	Local Govt
Runways (m)	Asphalt 1	1,430 x 23	1,645 x 30	1,600 x 30	2,027 x 23	1,803 x 30
	Asphalt 2	-	1,265 x 30	767 x 18	1,461 x 23	-
	Grass/Gravel 1	919 x 18	568 x 30	-	-	699 x 30
	Grass/Gravel 2	500 (glider)	-	-	-	500 x 30
Airport Area[2] (ha)		166.8	261	140	205	172
Current RPT Services		No	No	Yes	No	No

[1]2016 SA4
[2]Approximate
[3]Except Bacchus Marsh
[4]Excep Orbost Eastwards

Table 4-1: Regional Airport Comparisons

The comparisons show that Latrobe Airport has the comparative advantages of:

- High catchment population;
- Available land resources; and
- Easy access to major roads by available road assets.

This is balanced against limited airfield infrastructure, particularly runway length and width. Though this is a not an issue relating to feasible commercial development, it may be an issue for the introduction of RPT services.

4.3 Land Type Definition and Value

Two major aspects of the Strategic Development Plan are:

- Definition of land types – land allocation is largely dependent on the relative commercial value of the land and the intended usage of the land; and
- Definition of 'value' - In an airport land resource, the definition of 'value' is a key factor in land apportionment. Higher value land provides the opportunity for greater financial returns to the airport (higher rents etc.) or may have value adds due to proximity to a key function (car rentals to a terminal building) or may attract other tenants to the airport – a honey pot effect.

There is a major difference between this Strategic Plan and the 2019 Master Plan. The Strategic Plan is more pragmatic and less prescriptive of what development may occur. A range of compatible developments may take place in each land use type. This will allow for greater flexibility and ensure that a potential investor should not be deterred from considering locating their business at Latrobe Airport or making a significant capital spend to facilitate that investment.

The Strategic Plan identifies development types that are largely related to commercial value. The plans developed allocate land to each of these five zoning categories.

A. Terminal related especially if RPT services are introduced – high value uses such as car parking, car rentals, tourist related. This area includes the Gippsland Aero Club building.

B. Higher Value Commercial – larger land parcels that can support larger commercial operations such as MRO or flight training. Road access and frontage are key components. This is a key commercial land use that has the potential to generate optimal commercial returns for the airport and region through employment generation and possibly attracting similar types of complementary businesses. The aim is to maximize attractiveness of this land resource and facilitate development of this land use type. Some degree of land use flexibility is advantageous so that land users can grow in future if required. In some circumstances, there is the potential for this land use type to take over land occupied by a lower perceived value.

C. Small commercial – small operators such skydiving or joyrides, only small land parcels required. Road frontage is preferred, and airfield access is essential. Ideally, there would be some flexibility to allow these businesses to expand if required.

D. Private hangars – lower value land largely occupied by private aircraft owners to house their aircraft. that requires only basic infrastructure beyond airfield access. Road frontage is not required though airfield access is essential. It is considered that the occupants of private hangars have a long term commitment to the airport that derives from being embedded in both the airport and wider community.

E. Emergency services – helipads, CFA, DELWP, etc. Emergency services are a key airport use due to the need to provide for firefighting resources and the existing helicopter base that is used for air access to the adjacent Latrobe Regional Hospital.

4.4 Aeronautical Development

As this project is primarily about land and commercial development, aeronautical development are largely considered to be secondary and as enablers to land development. The following are to be noted:

- Development assumes that the runway strip to Runway 03/21 will at some stage be widened from 90 metres to 140 metres. This will be dependent on any significant runway work that would trigger the wider strip. Therefore, the wider 140 metre runway has been safeguarded in the development plans;
- Taxiways that facilitate access to the terminal are proposed to be safeguarded for Code C. This would allow a wider range of aircraft to be utilised in future;
- Taxiways and taxilanes that access commercial areas are proposed to be Code B. This will allow aircraft with a wingspan of up to 24 metres to access these areas. The nature of current and likely future aviation operations and business were discussed during the study and it is considered unlikely that wider wingspan aircraft will be required; and
- Additional aircraft parking apron may be required to service commercial development. This will be developed on a case by case basis.

5 Strategic Development Plan Stages

5.1 Development Stages Overview

Incremental growth is the driver for development stages – the aim is to align airport funded development with private sector development. This focus on incremental growth is a second departure from the 2019 Master Plan where the emphasis was on large development stages and major airport investments required to facilitate that investment.

Incremental growth also allows for development flexibility so that changes in demand can be met without major disruption. An overriding aim in the development of the staging plans has been avoidance of definitive decision points which will define development paths that may be difficult or expensive to change or deviate from.

The identified development stages are:

- Existing development – land use development as it is now. The existing condition is outlined in Section 2.3 above;
- Immediate development – land that can be developed up to 2 years out from 2020 - this is land that has access to roads, airfield and services. Development can occur quickly without major investment from the Council or Airport;
- 2 to 5 year;
- 5 to 10 year;
- 10 years +; and
- 20 years +.

The latter stages are considered to be more aspirational and will largely depend on development decisions especially the introduction of RPT services and larger aircraft. These would drive major airfield developments.

The areas shown for development are indicative only. Planning for larger land parcels will be subject to further planning dependent on ongoing market demands.

Large scale drawings are included as Appendix B of this report.

5.2 Immediate Development Stage

Land identified for 'Immediate' development has the following qualities:

- Direct road access;
- Access to services – power, water, sewage;
- Cleared land; and
- Access to the airfield.

It is expected that this land resource can be brought online quickly and at comparatively low cost.

There will still need to be some site works required to make this land serviceable.

All of the land identified for immediate development is located in the 'Central Core' area located to the east of the site. Land identified for immediate development is shown below.

The additional private hangars (shown in orange) are not included in this stage as they are currently under construction.

Associated with land development are airfield developments. These are:

- Code B taxilane extension to facilitate development of Area B2 (adjacent to Valley Drive); and
- Apron works associated with the development of Area B1 (off Airfield Road).

Approximate areas for each land use type and in each sub area are shown in the table below.

Zone		Sub - Zone	Immediate Development
A	Terminal Related High Value	A1	
		A2	
B	Commercial Development: Larger Businesses Higher Value	B1	7,900
		B2	48,300
		B3	
		B4	
		B5	
C	Smaller Businesses Lower Value	C1	450
		C2	2,400
		C3	3,700
D	Private Hangars	D1	
		D2	
E	Emergency Services / Government	E1	
		E2	

Table 5-1: Immediate Development Stage – Land Areas

Figure 5-1: Immediate Development Stage – Land Location in Central Core

Larger scale drawings of the Immediate Development Stage are included as Appendix B of this report.

5.3 2 – 5 Year Development Stage

Land intended to be developed in the 2 – 5 Year Development stage is located at the southern end of the airport adjacent to Village Drive and close to the Latrobe Regional Hospital.

Development proposed for this stage are:

- Additional commercial land (Area B3) with frontage to Village Avenue. This includes enabling Code B taxilane works to support this area; and
- Development of a helipad to serve the Latrobe Regional Hospital.

The additional areas proposed to be developed at this stage are shown below:

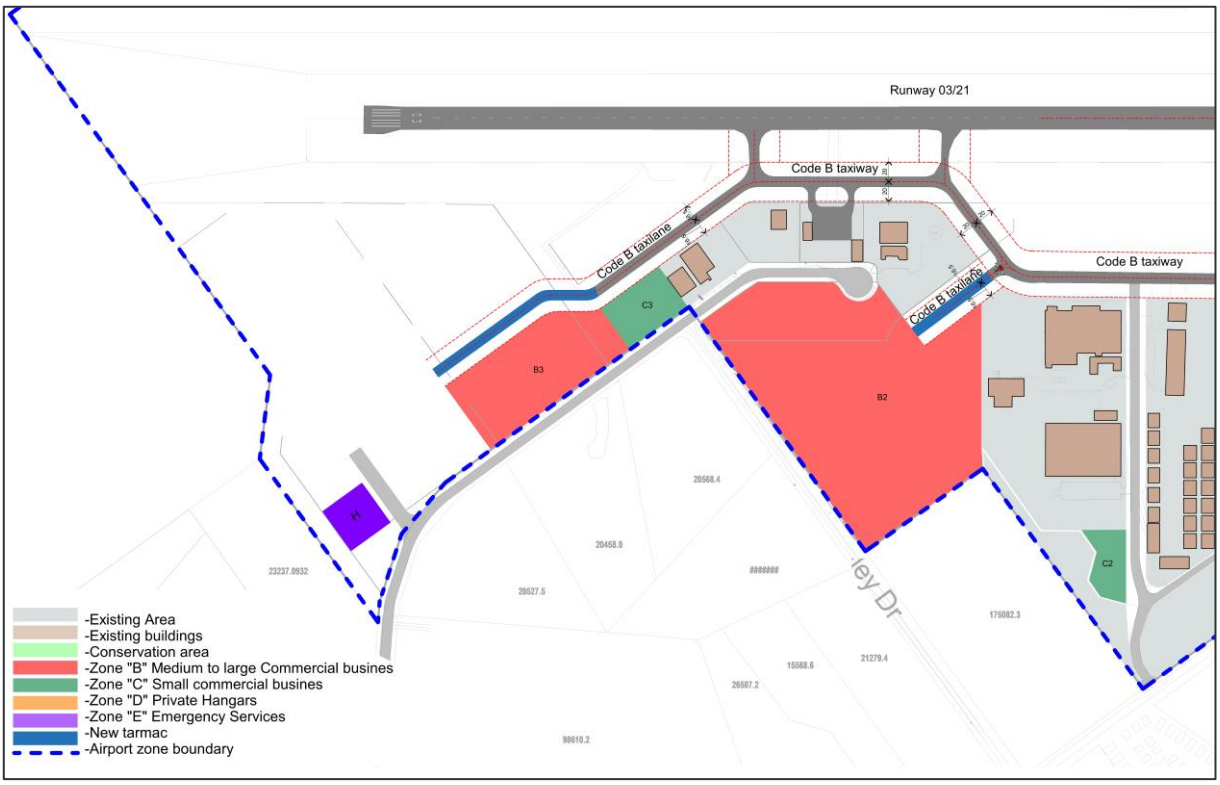

Figure 5-2: 2 – 5 Year Development Stage

It will be noted that there is a kink in the extended Code B taxilane. This is proposed as it is considered that the current land parcels fronting Village Avenue have insufficient depth to attract high value commercial businesses. It is proposed that the new taxilane be offset 28.5 metres (centre to centre) from the existing. This will allow for a future dual taxilane at the northern end should this ever be required in future.

The additional areas and cumulative land development are shown in the table below.

Zone		Sub - Zone	Immediate Development	2 - 5 Years
A	Terminal Related High Value	A1		
		A2		
B	Commercial Development: Larger Businesses Higher Value	B1	7,900	7,900
		B2	48,300	48,300
		B3		13,150
		B4		
		B5		
C	Smaller Businesses Lower Value	C1	450	450
		C2	2,400	2,400
		C3	3,700	3,700
D	Private Hangars	D1		
		D2		
E	Emergency Services / Government	E1		
		E2		

Table 5-2: 2 – 5 Year Development Stage – Land Areas

5.4 5 – 10 Year Development Stage

It is proposed that there be development be development at both and north of the airport in the 5 – 10 Year Development Stage. The overall airport plan at this stage is shown below.

Figure 5-3: Overall 5 – 10 Year Development Plan

In detail, the proposals for this stage are:

- Additional Zone B development at the northern end. This is intended to replace area current allocated as Zone D (Private Hangar);
- Zone A terminal related development close to the terminal;
- Extension of the Zone B commercial area southwards along Village Avenue; and
- Development of private hangars and associated infrastructure to the south of the airport site.

Area details for this stage are shown below and refer to drawings following the table:

Zone		Sub - Zone	Immediate Development	2 - 5 Years	5-10 Years
A	Terminal Related High Value	A1			8,500
		A2			
B	Commercial Development: Larger Businesses Higher Value	B1	7,900	7,900	9,300
		B2	48,300	48,300	48,300
		B3		13,150	21,350
		B4			
		B5			
C	Smaller Businesses Lower Value	C1	450	450	450
		C2	2,400	2,400	2,400
		C3	3,700	3,700	3,700
D	Private Hangars	D1			8,900
		D2			
E	Emergency Services / Government	E1			
		E2			

Table 5-3: 5 - 10 Year Development Stage – Land Areas

Figure 5-4: 5 – 10 Year Development Plan – Central Core

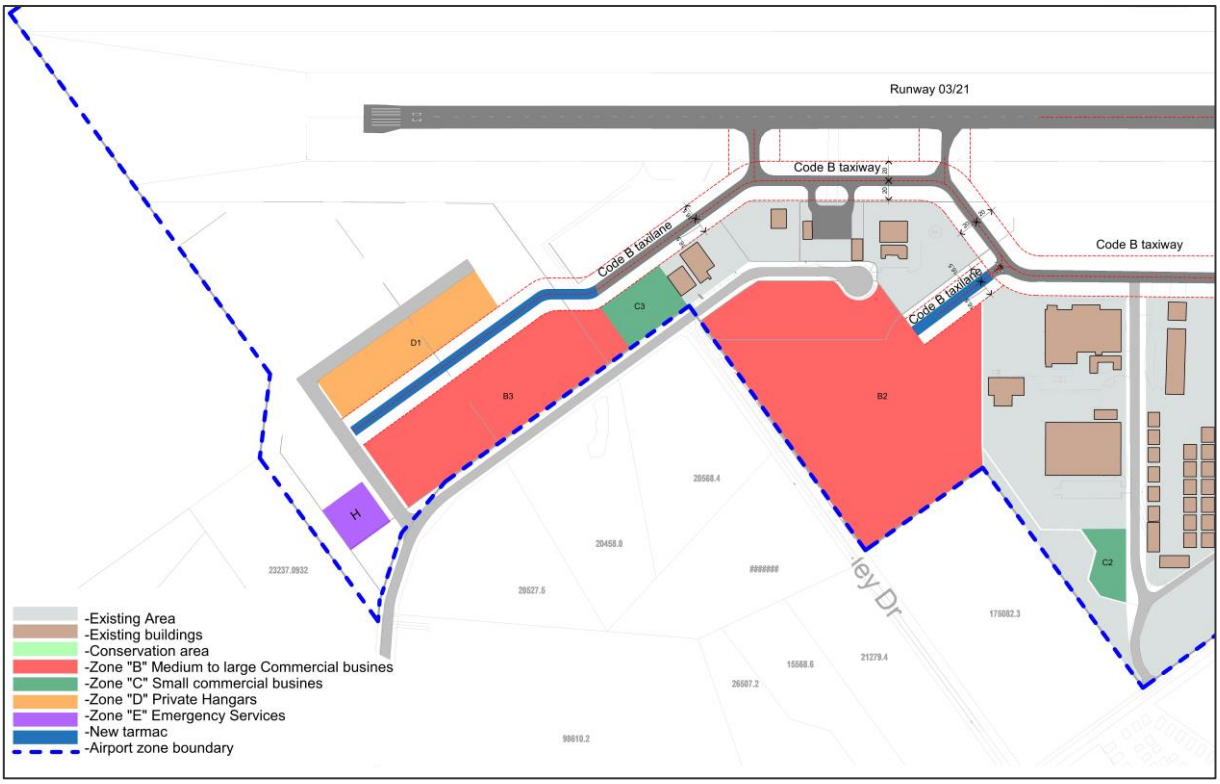

Figure 5-5: 5 – 10 Year Development Plan – South End

5.5 10 Year Plus Development Stage

The major aspect of the 10 year Plus development stage is that it has been assumed that sustainable RPT services would be introduced. These would trigger runway upgrades which in turn would have impacts on the existing land resource.

The following assumptions have been made:

- The introduction of RPT services would require widening of Runway 03/ 21 to thirty metres. This is turn would trigger widening of the runway strip;
- A parallel Code C taxiway would be required to link the southern and northern haves of the airport. The alternative to this would be that the runway would need to be used for taxiing. This would have a major impact on overall runway capacity;
- The widening of the runway strip and the construction of the taxiway would have both spatial and OLS impacts on the existing land resource allocated to Zone E – Emergency Services. There would be loss of assets and the need to relocate some functions elsewhere; and
- A new parallel runway would be economically hard to justify and has not been included.

Should it be decided that the construction of a new parallel runway could be justified, then the actions of this stage that derive from the runway upgrade would not be required.

The proposed overall 10 year Plus plan is shown below.

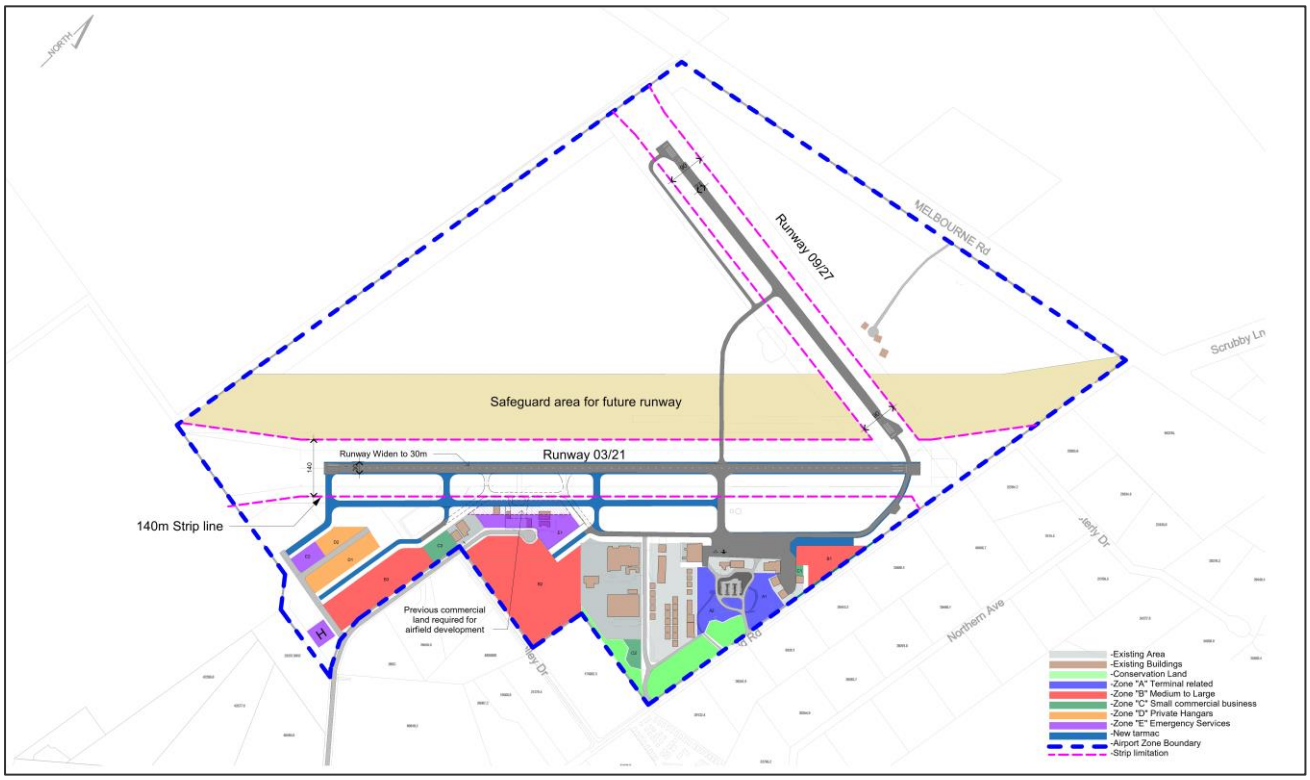

Figure 5-6: Overall 10 Year Plus Development Plan

Proposed aspects of this stage are:

- Development of the terminal zone to provide uses that are complimentary to a passenger terminal. These functions may include expanded car parking, car rental facilities, commercial facilities that could serve the whole airport precinct;
- As part of the proposed development of the Terminal Zone, it is proposed that some existing functions and facilities currently located in this area would be relocated. This includes the CFA station, SES base, and the Air Cadets Hall;

- Some emergency services currently located on Village Avenue would need to be relocated due to OLS constraints imposed by the widened runway strip and the need to facilitate construction of the parallel taxiway;
- Therefore, there would need to be a comprehensive reorganization and relocation of all government and emergency services located on site. Some of the existing services such as the CFA and SES may not need to be located on the airport site; and
- A second taxilane is proposed for the south end of the airport. This would serve additional private hangars and relocated emergency services.

Zone		Sub - Zone	Immediate Development	2 - 5 Years	5-10 Years	10 Years plus
A	Terminal Related High Value	A1			8,500	8,500
		A2				9,150
B	Commercial Development: Larger Businesses Higher Value	B1	7,900	7,900	9,300	9,300
		B2	48,300	48,300	48,300	48,300
		B3		13,150	21,350	21,350
		B4				
		B5				
C	Smaller Businesses Lower Value	C1	450	450	450	450
		C2	2,400	2,400	2,400	2,400
		C3	3,700	3,700	3,700	3,700
D	Private Hangars	D1			8,900	8,900
		D2				4,150
E	Emergency Services / Government	E1				13,800
		E2				3,200

Table 5-4: 10 Year Plus Development Stage – Land Areas

Figure 5-7: 10 Year Plus Development Plan – Central Core

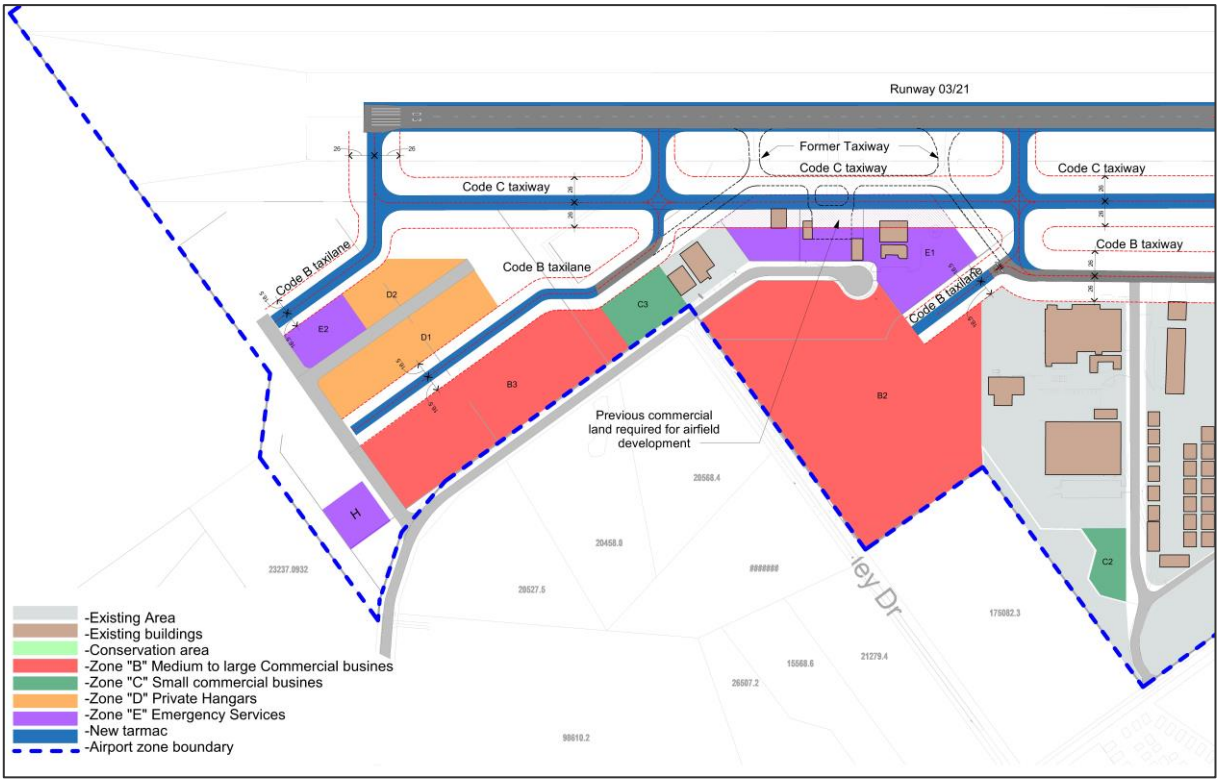

Figure 5-8: 10 Year Plus Development Plan – South End

5.6 20 Year Plus Development Stage

It is assumed that development of land west of the proposed runway would not occur for at least 20 years. This is major land resource and those areas fronting Old Melbourne Road have good road access. However, this area does not have any connection to services so land development will be expensive.

The areas to the south west of the airport have neither road access nor services connections. Development of this area is considered to be much in the future.

The proposed overall 20 year Plus plan is shown below.

Figure 5-9: Overall 20 Year Plus Development Plan

Appendix A: Existing Conditions

NORTH

Runway 09/27

Runway 03/21

90m Strip line

Gas Pipeline easement

Gas Pipeline easement

Gas Pipeline easement

Old MELBOURNE Rd

Future Runway

Scrubby Ln

Easterly Dr

Northern Ave

Airfield Rd

Valley Dr

Wilkes Rd

-Terminal
-Aero club
-Aviation Museum
-Aviation Businesses
-Private Hangars, houses
-Emergency Services, Government
-Conservation Land
-Airport Zone Boundary
-90m Strip limitation

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PROJECT
Project Name

DRAWING TITLE
Existing Airport land

0 0.37 0.75 1.87 3.75

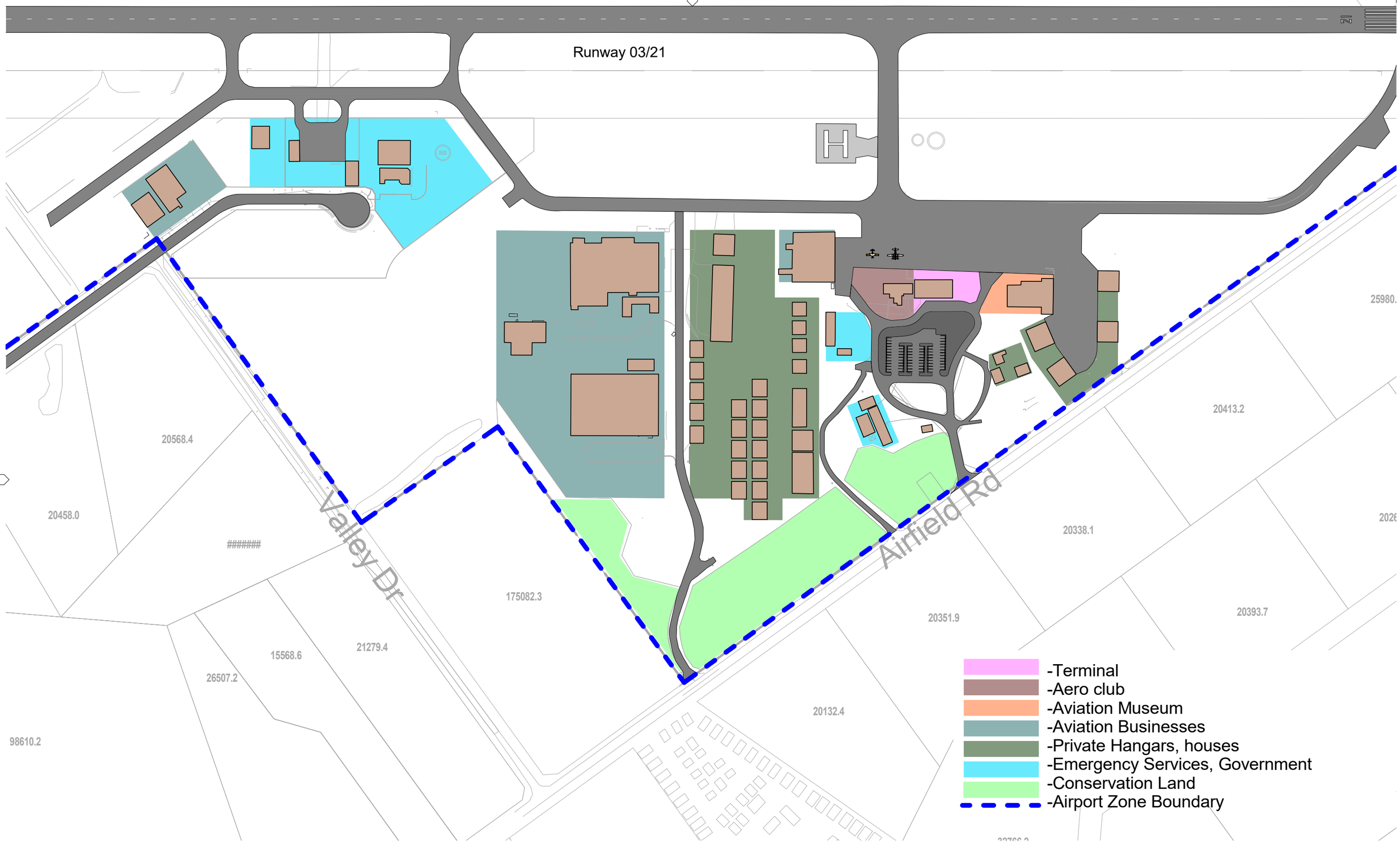
DRAWING NO.
LB-00-003

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

DRAWN BY
AA

ISSUE DATE



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PROJECT
Project Name

DRAWING TITLE
Existing Terminal Area

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-004

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

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Author

ISSUE DATE

Appendix B: Proposed Development Plans

Runway 03/21

Code B taxiway

Code B taxilane

Code B taxilane

Code B taxiway

Code C taxiway

Code B taxiway

Vehicle access

Valley Dr

Airfield Rd

20568.4

20458.0

#######

175082.3

20351.9

20338.1

20413.2

25980.

20393.7

15568.6

21279.4

26507.2

20132.4

98610.2

New Hangars

-Terminal
-Aero club
-Aviation Museum
-Aviation Businesses
-Private Hangars, houses
-Emergency Services, Government
-Available Higher value Development land
-Conservation Land
-New Developed Land
-Airport zone boundary

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PROJECT
Project Name

DRAWING TITLE
Imediate Existing Development 1

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-005

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

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Runway 03/21

Code B taxiway

Code B taxilane

Code B taxilane

Code B taxiway

Code C taxiway

Code B taxiway

Vehicle access

Valley Dr

Airfield Rd

New Hangars

-Existing Area
-Existing buildings
-Zone "B" Medium to large Commercial busines
-Zone "C" Small commercial busines
-Zone "D" Private Hangars
-Zone "E" Emertgency Services
-New tarmac
-Airport zone boundary

20568.4
20458.0
#######
175082.3
15568.6
21279.4
26507.2
98610.2
20132.4
20351.9
20338.1
20413.2
20393.7
25980.
2026

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PROJECT
Project Name

DRAWING TITLE
Imediate New Development 1

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-006

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

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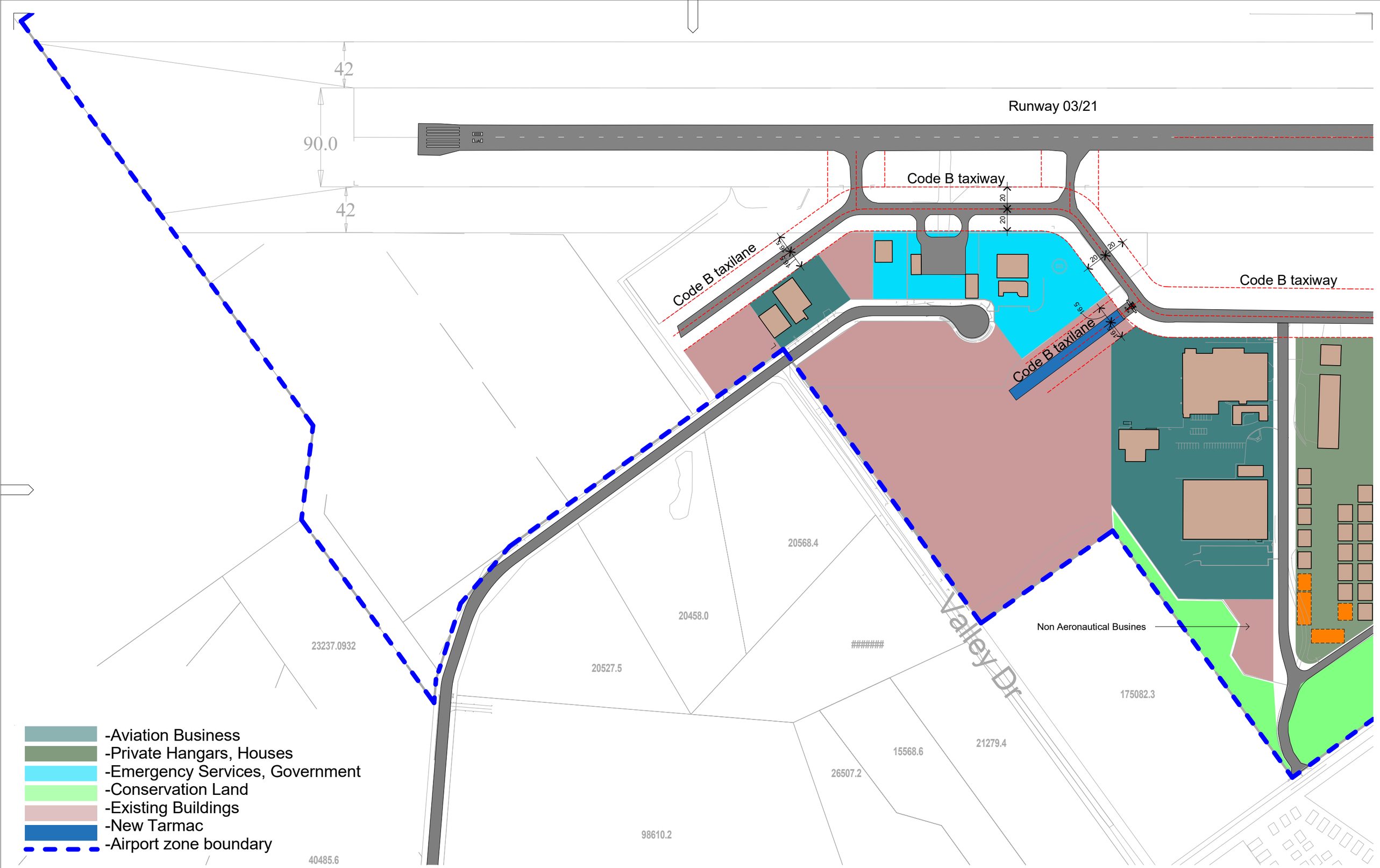

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PROJECT
Project Name

DRAWING TITLE
Imediate Existing Development 2

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-007

PROJ. NO.
Project Number

SCALE
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ISSUE DATE

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PROJECT
Project Name

DRAWING TITLE
Imediate New Development 2

0 0.15 0.30 .75 1.5

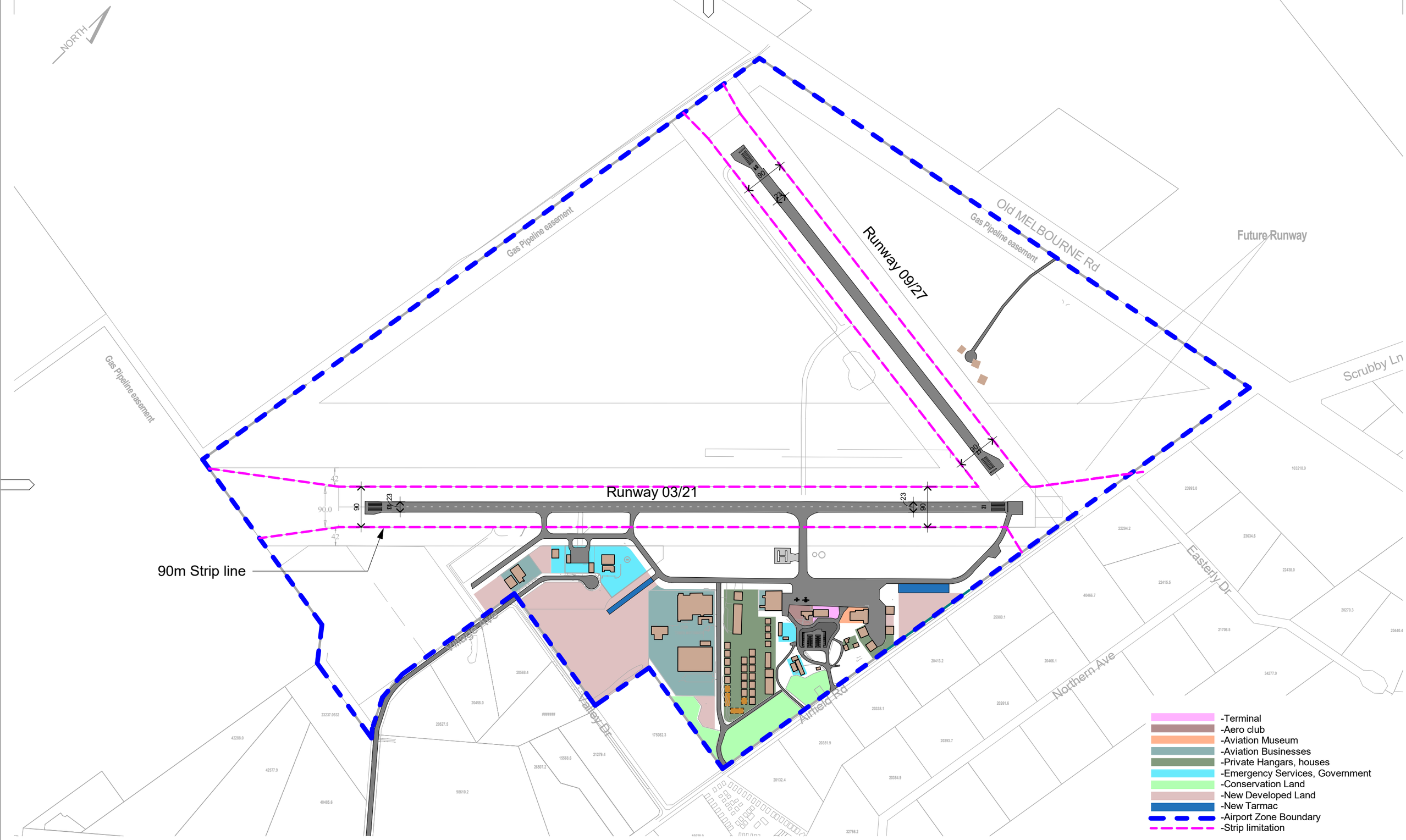
DRAWING NO.
LB-00-008

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

DRAWN BY
Author

ISSUE DATE



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PROJECT
Project Name

DRAWING TITLE
Imediate Existing Development 3

0 0.37 0.75 1.87 3.75

DRAWING NO.
LB-00-009

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

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Author

ISSUE DATE

NORTH

Runway 09/27

Runway 03/21

Gas Pipeline easement

Gas Pipeline easement

Gas Pipeline easement

Old MELBOURNE Rd

Future Runway

Scrubby Ln

Easterly Dr

Northern Ave

Valley Dr

Airfield Rd

90m Strip line

90.0

42

42

-Existing Area
-Existing Buildings
-Conservation Land
-Zone "B" Medium to Large
-Zone "C" Small commercial business
-Zone "D" Private Hangars
-Zone "E" Emergency Services
-New tarmac
-Airport Zone Boundary
-Strip limitation

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PROJECT
Project Name

DRAWING TITLE
Imediate New Development 3

0 0.37 0.75 1.87 3.75

DRAWING NO.
LB-00-010

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

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PROJECT
Project Name

DRAWING TITLE
2-5 Years Existing Development 1

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-101

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

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ISSUE DATE

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DRAFT

Runway 03/21

Code B taxiway

Code B taxiway

Code B taxiway

Code C taxiway

Code B taxilane

Code B taxilane

Vehicle access

Valley Dr

Airfield Rd

20568.4

20458.0

#######

175082.3

21279.4

15568.6

26507.2

98610.2

20132.4

20351.9

20338.1

20413.2

20393.7

25980.

-Existing Area
-Existing buildings
-Zone "B" Medium to large Commercial busines
-Zone "C" Small commercial busines
-Zone "D" Private Hangars
-Zone "E" Emertgency Services
-New tarmac
-Airport zone boundary

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PROJECT
Project Name

DRAWING TITLE
2-5 Years New Development 1

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-102

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

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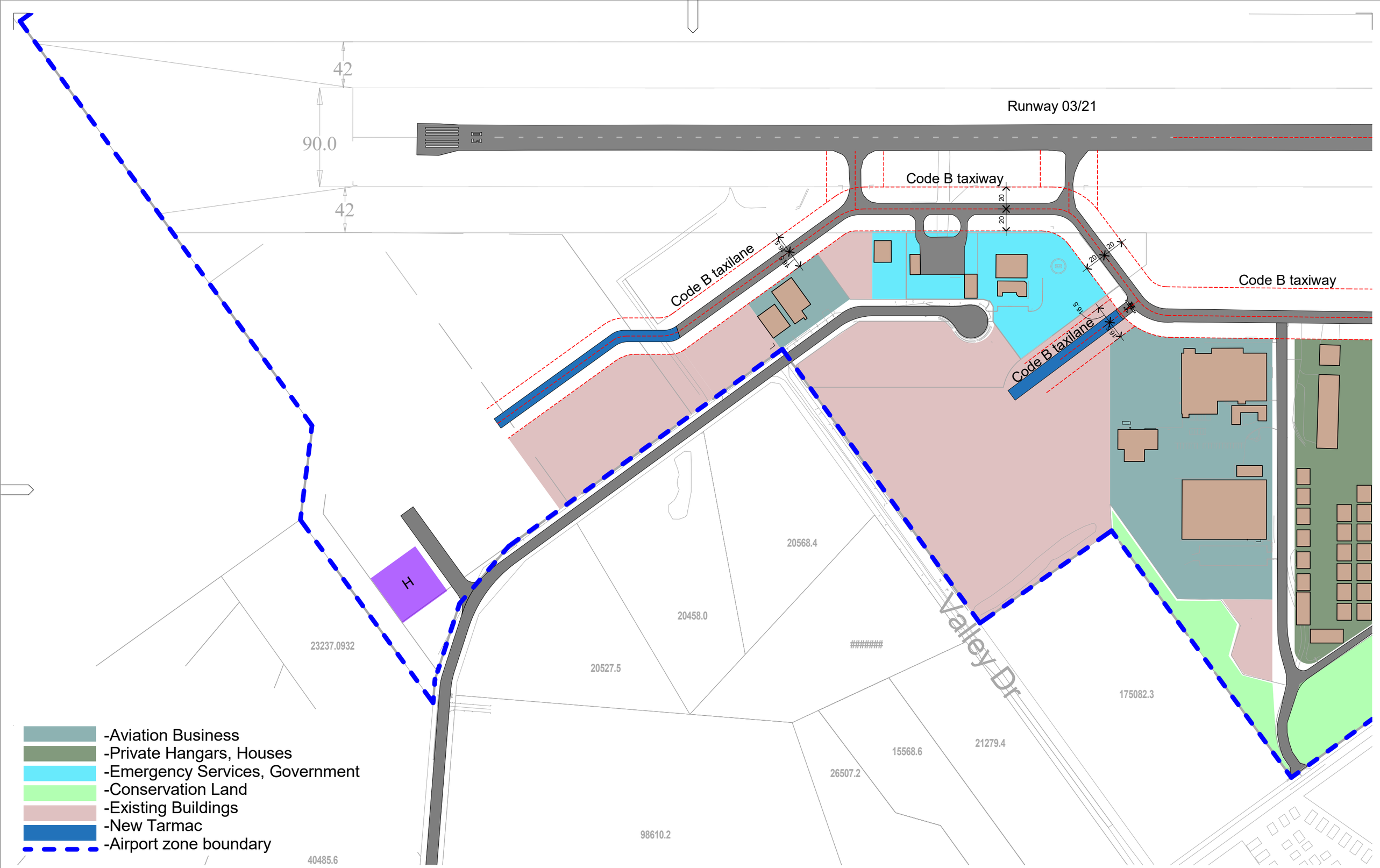

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PROJECT
Project Name

DRAWING TITLE
2-5 Years Existing Development 2

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-103

PROJ. NO.
Project Number

SCALE
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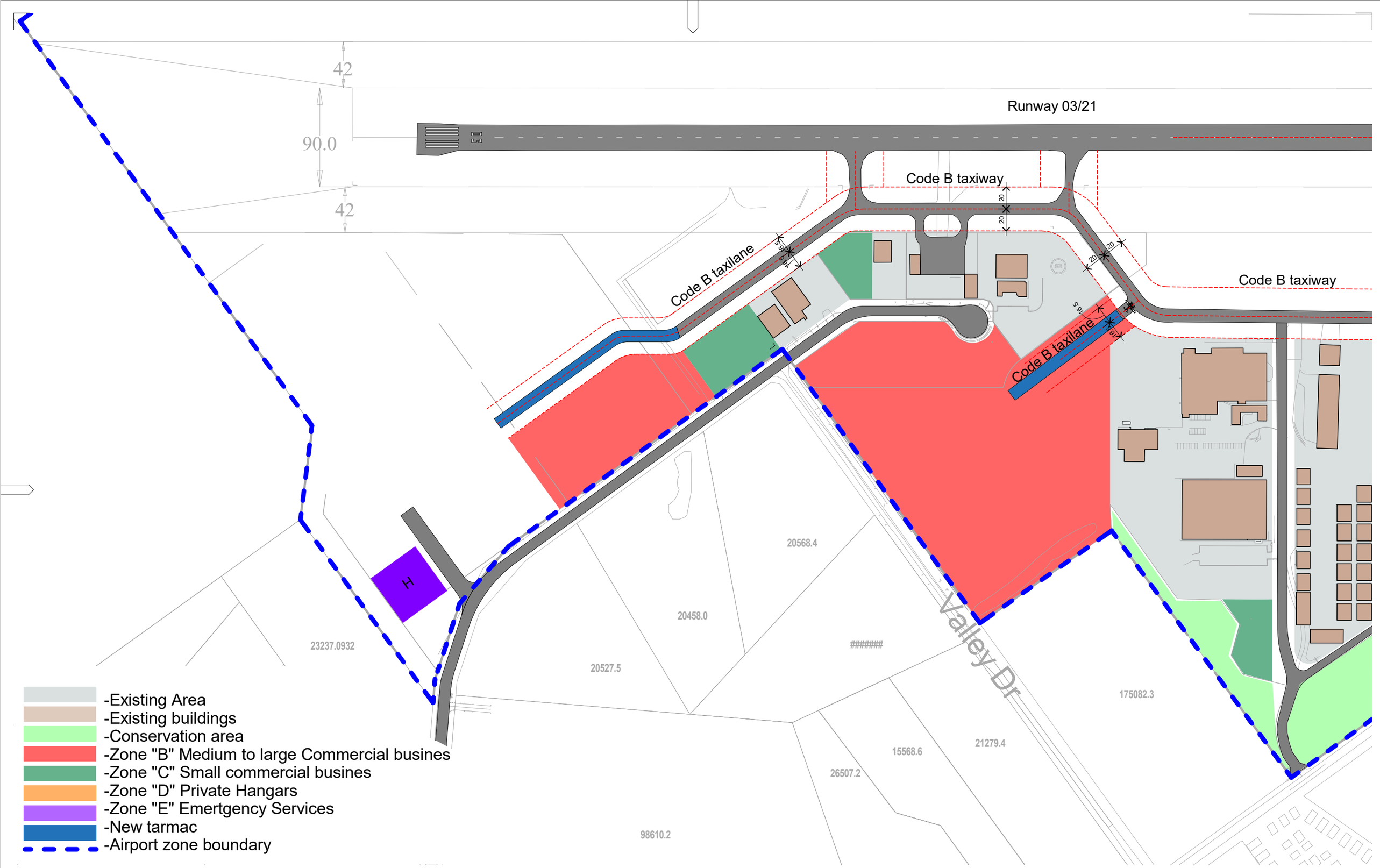
DRAWN BY
Author

ISSUE DATE



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PROJECT
Project Name

DRAWING TITLE
2-5 Years New Development 2

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-104

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

DRAWN BY
Author

ISSUE DATE

NORTH

Runway 09/27

Runway 03/21

90m Strip line

Gas Pipeline easement

Gas Pipeline easement

Gas Pipeline easement

Old MELBOURNE Rd

Future Runway

Scrubby Ln

Easterly Dr

Northern Ave

Valley Dr

Allfield Rd

-Terminal
-Aero club
-Aviation Museum
-Aviation Businesses
-Private Hangars, houses
-Emergency Services, Government
-Conservation Land
-New Developed Land
-New Tarmac
-Airport Zone Boundary
-Strip limitation

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PROJECT
Project Name

DRAWING TITLE
2-5 Years Existing Development 3

0 0.37 0.75 1.87 3.75

DRAWING NO.
LB-00-105

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

DRAWN BY
Author

ISSUE DATE

NORTH

Runway 09/27

Runway 03/21

90m Strip line

Gas Pipeline easement

Gas Pipeline easement

Gas Pipeline easement

Old MELBOURNE Rd

Future Runway

Scrubby Ln

Easterly Dr

Northern Ave

Airfield Rd

Valley Dr

Hughes Ave

-Existing Area
-Existing Buildings
-Conservation Land
-Zone "B" Medium to Large
-Zone "C" Small commercial business
-Zone "D" Private Hangars
-Zone "E" Emergency Services
-New tarmac
-Airport Zone Boundary
-Strip limitation

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PROJECT
Project Name

DRAWING TITLE
2-5 Years New Development 3

0 0.37 0.75 1.87 3.75

DRAWING NO.
LB-00-106

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

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Author

ISSUE DATE

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PROJECT
Project Name

DRAWING TITLE
5-10 Years Existing Development 1

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-201

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

DRAWN BY
Author

ISSUE DATE

Runway 03/21

Code B taxiway

Code B taxilane

Code B taxilane

Code B taxiway

Code C taxiway

Code B taxiway

Vehicle access

Valley Dr

Airfield Rd

-Existing Area
-Existing buildings
-Zone "A" Terminal related
-Zone "B" Medium to large Commercial busines
-Zone "C" Small commercial busines
-Zone "D" Private Hangars
-Emertgency Services
-New tarmac
-Airport zone boundary

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PROJECT
Project Name

DRAWING TITLE
5-10 Years New Development 1

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-202

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

DRAWN BY
Author

ISSUE DATE

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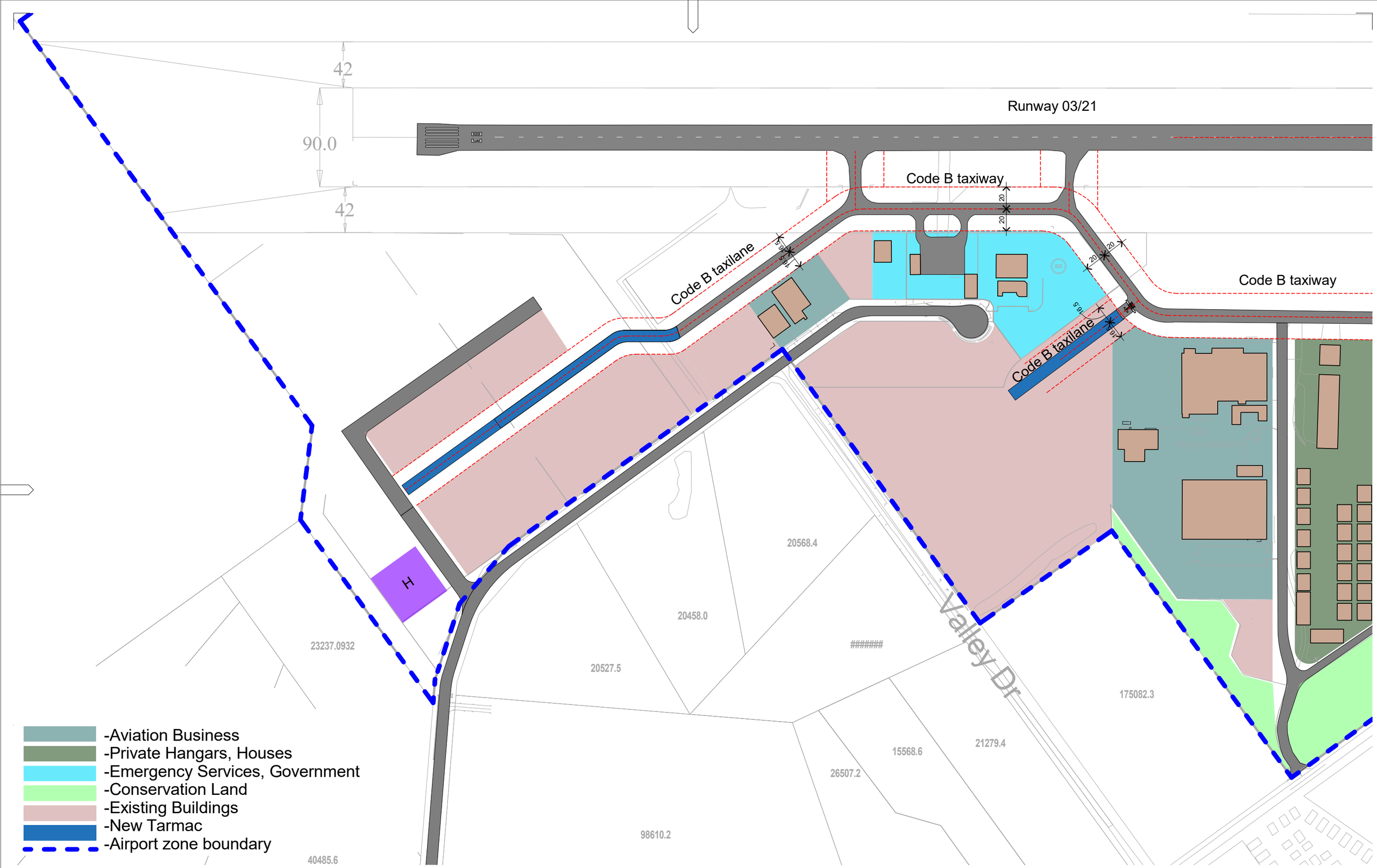

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PROJECT
Project Name

DRAWING TITLE
5-10 Years Existing Development 2

0 0.15 0.30 .75 1.5

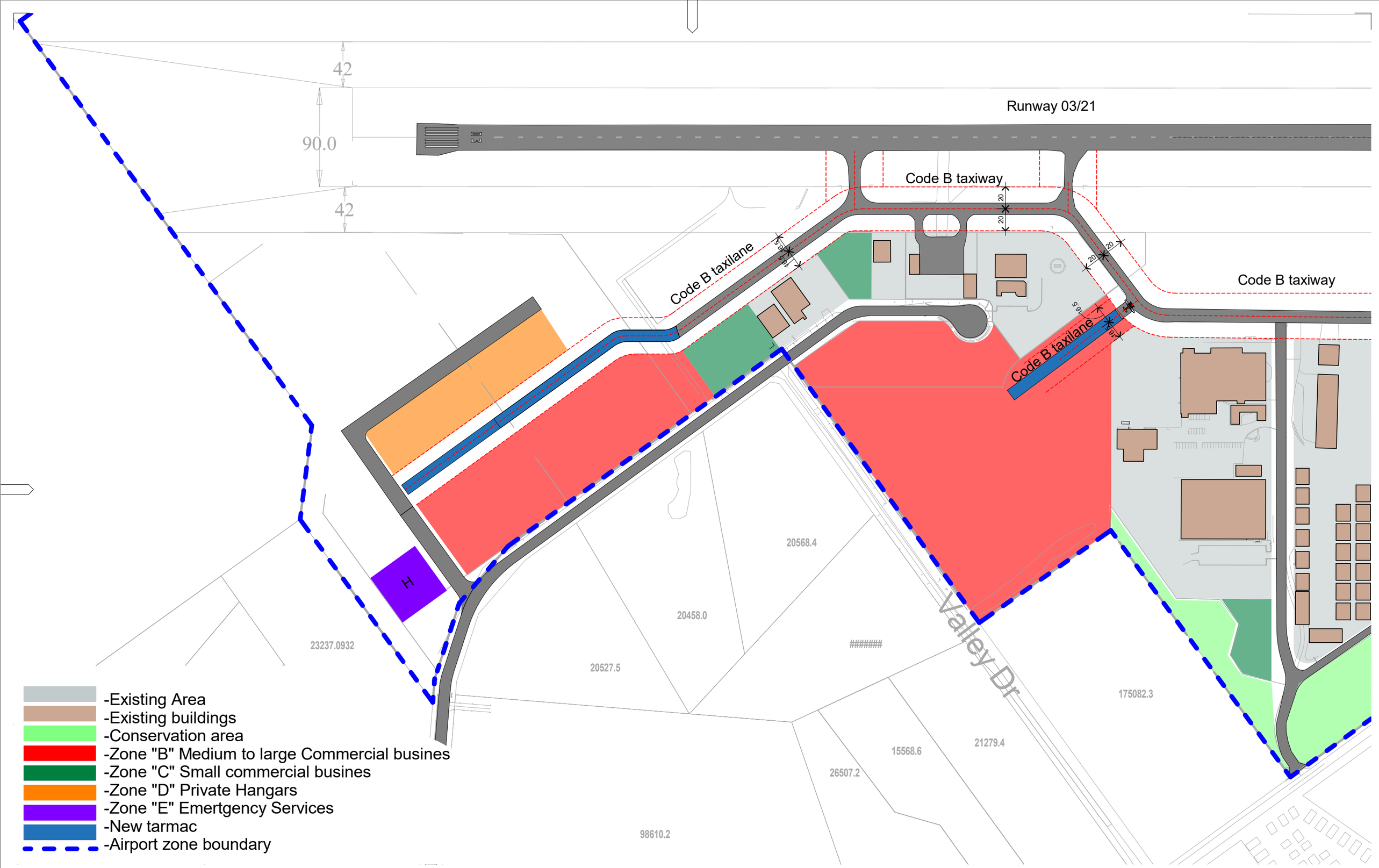
DRAWING NO.
LB-00-203

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

DRAWN BY
Author

ISSUE DATE



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PROJECT
Project Name

DRAWING TITLE
5-10 Years New Development 2

0 0.15 0.30 .75 1.5

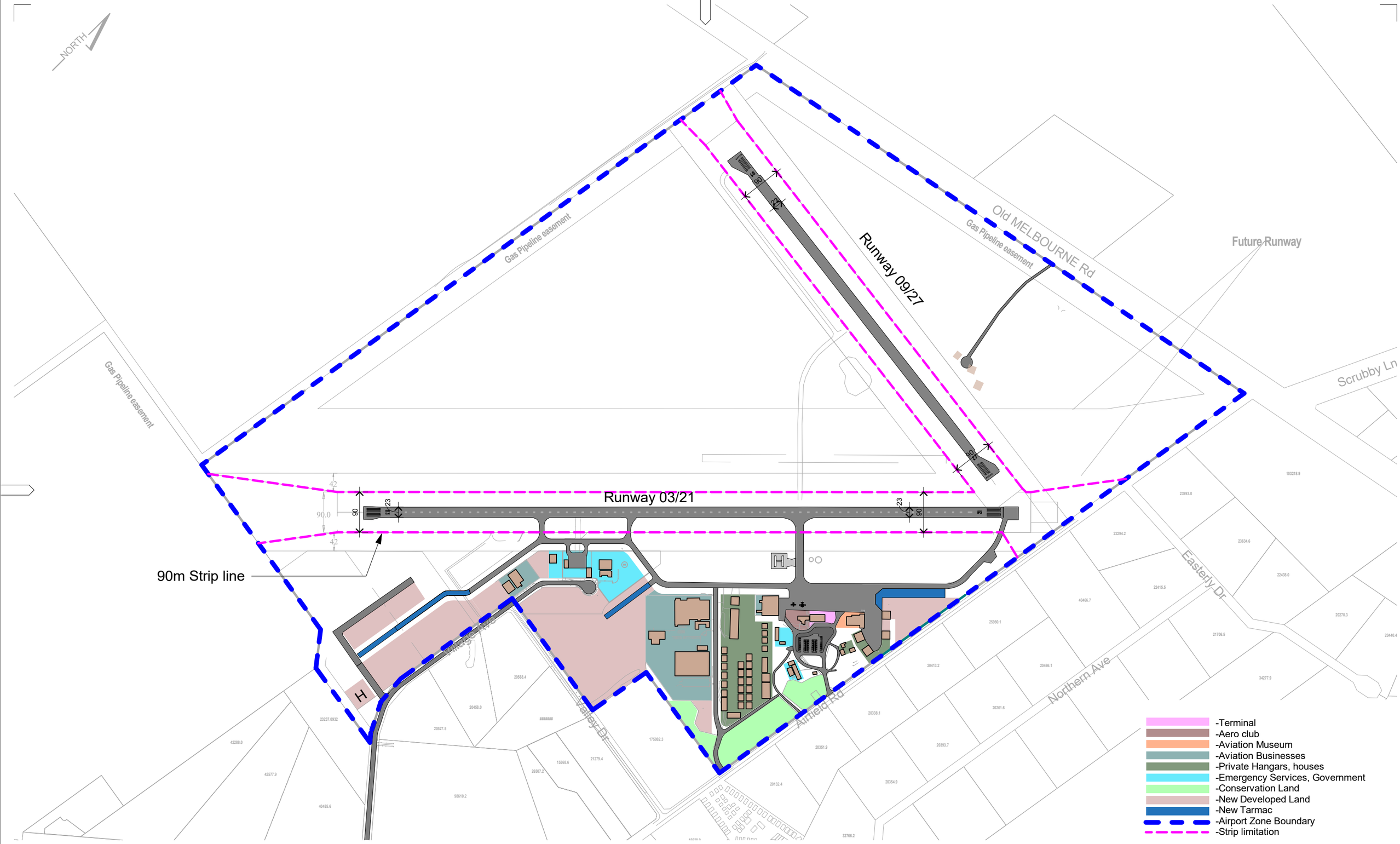
DRAWING NO.
LB-00-204

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

DRAWN BY
Author

ISSUE DATE



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PROJECT
Project Name

DRAWING TITLE
5-10 Years Existing Development 3

0 0.37 0.75 1.87 3.75

DRAWING NO.
LB-00-205

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

DRAWN BY
Author

ISSUE DATE

NORTH

Runway 09/27

Runway 03/21

Gas Pipeline easement

Gas Pipeline easement

Gas Pipeline easement

Old MELBOURNE Rd

Future Runway

Scrubby Ln

Easterly Dr

Northern Ave

Valley Dr

Airfield Rd

Hughes Rd

90m Strip line

42

90.0

42

90

23

23

90

-Existing Area
-Existing Buildings
-Conservation Land
-Zone "A" Terminal related
-Zone "B" Medium to Large
-Zone "C" Small commercial business
-Zone "D" Private Hangars
-Zone "E" Emergency Services
-New tarmac
-Airport Zone Boundary
-Strip limitation

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PROJECT
Project Name

DRAWING TITLE
5-10 Years New Development 3

0 0.37 0.75 1.87 3.75

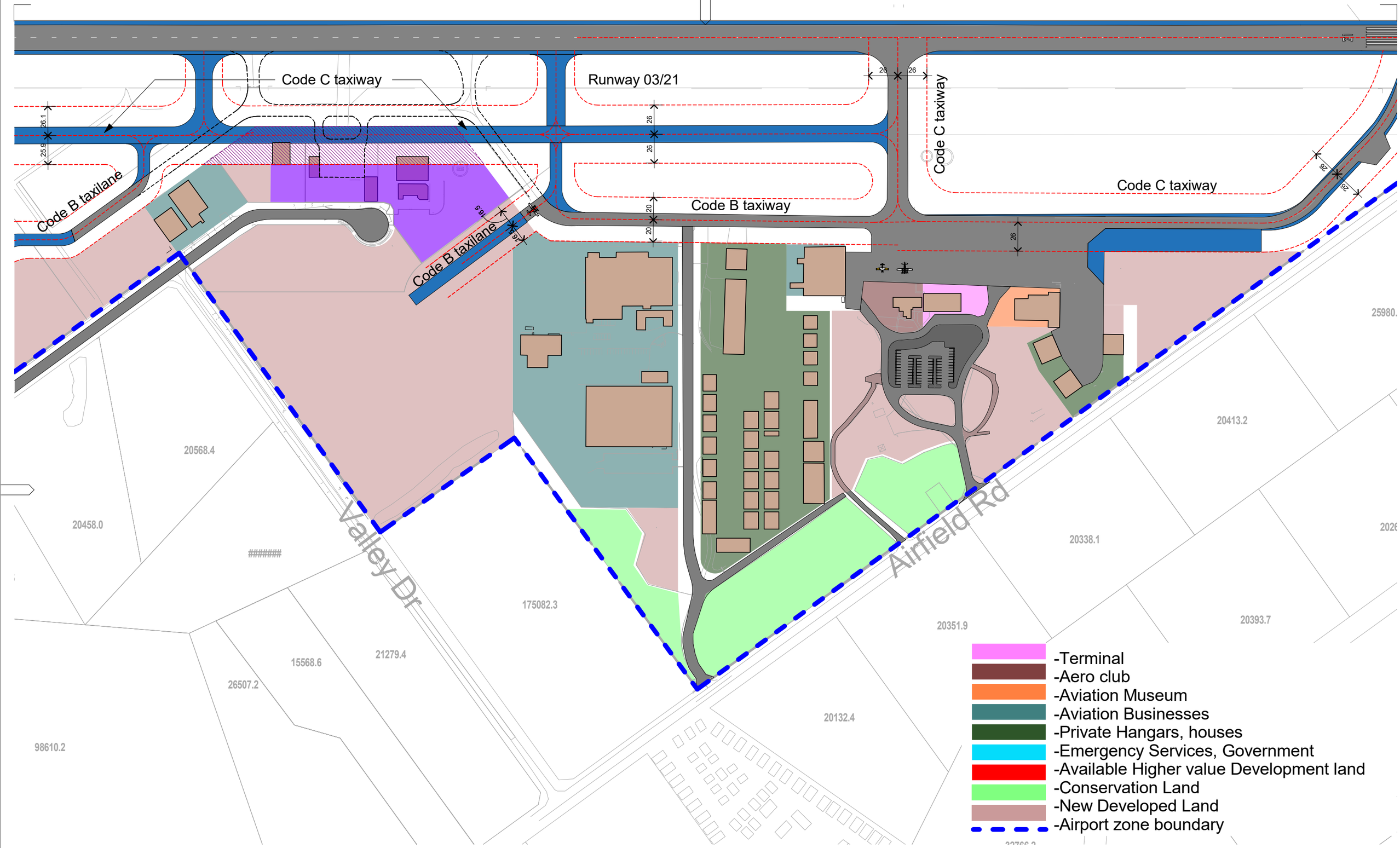
DRAWING NO.
LB-00-206

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

DRAWN BY
Author

ISSUE DATE



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PROJECT
Project Name

DRAWING TITLE
10 Years Plus Existing Development 1

0 0.15 0.30 .75 1.5

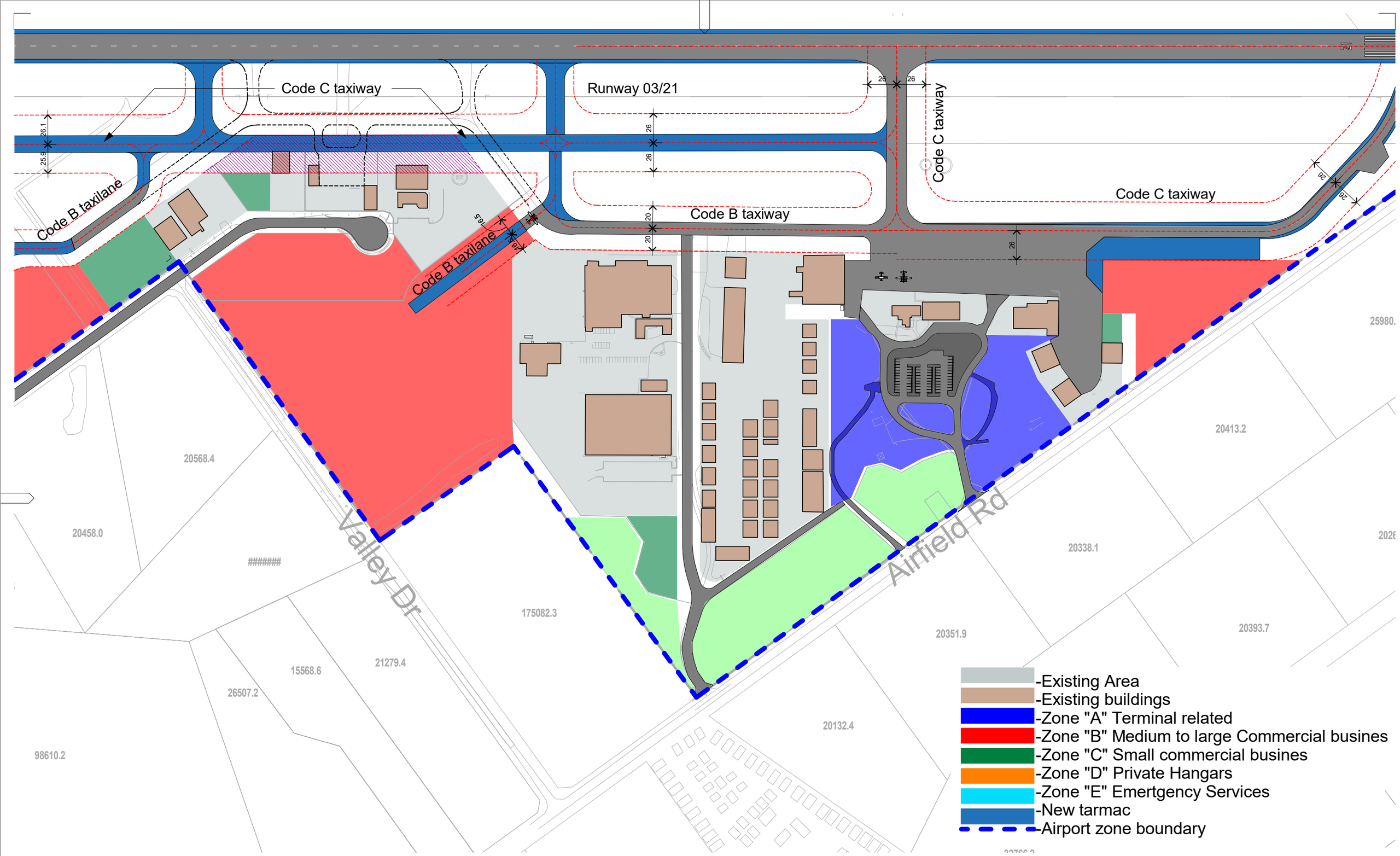
DRAWING NO.
LB-00-301

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

DRAWN BY
Author

ISSUE DATE



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PROJECT
Project Name

DRAWING TITLE
10 Years Plus New Development 1

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-302

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

DRAWN BY
Author

ISSUE DATE

Runway 03/21

Code C taxiway

Code C taxiway

Code C taxiway

Code B taxiway

Code B taxilane

Code B taxilane

Code B taxilane

Valley Dr

H

42

90.0

42

26

26

16.5

20568.4

20458.0

23237.0932

20527.5

#######

175082.3

15568.6

21279.4

26507.2

98610.2

40485.6

-Aviation Business
-Private Hangars, Houses
-Emergency Services, Government
-Conservation Land
-Existing Buildings
-New Tarmac
-Airport zone boundary

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PROJECT
Project Name

DRAWING TITLE
10 Years Plus Existing Development 2

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-303

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

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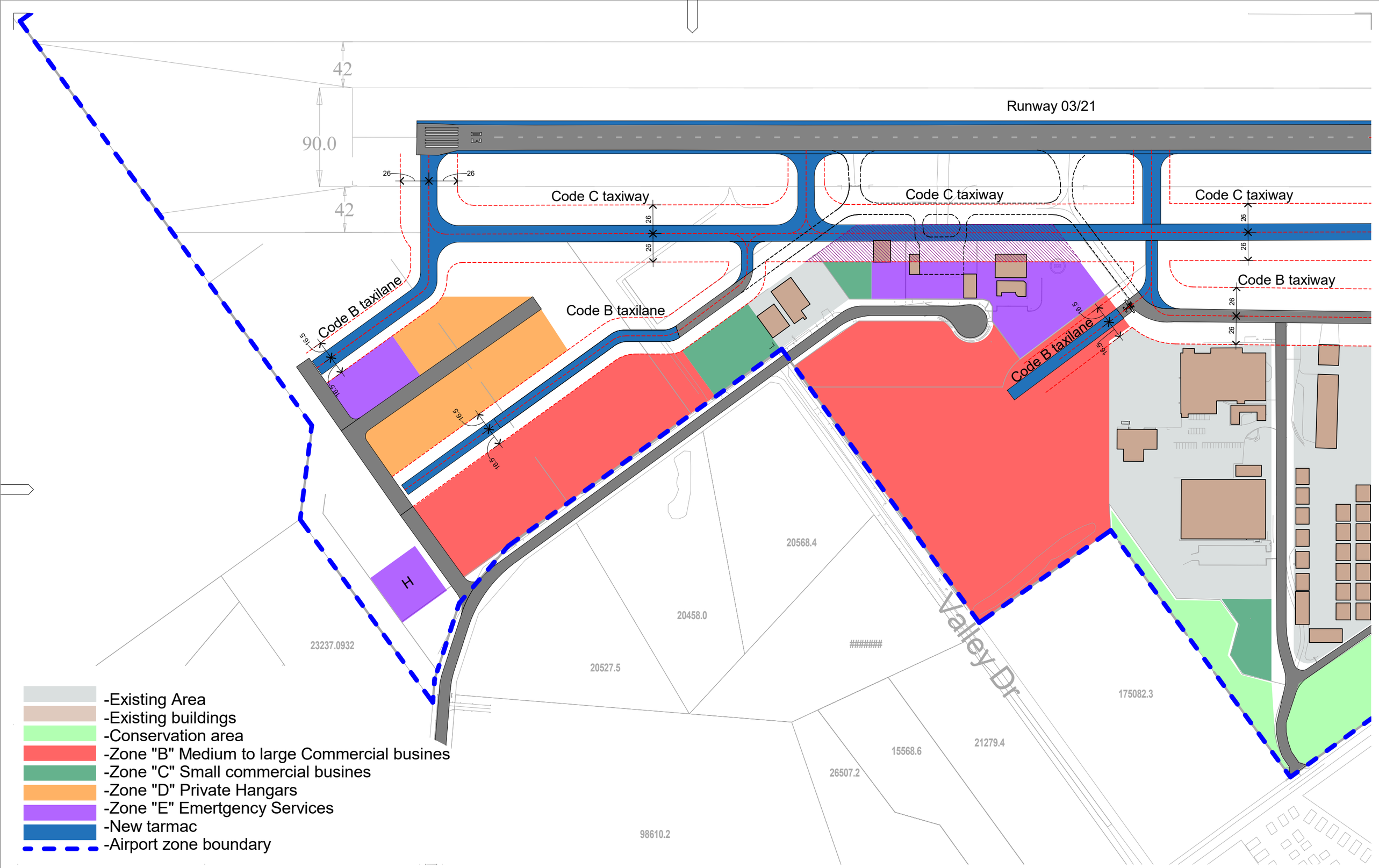
ISSUE DATE



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PROJECT
Project Name

DRAWING TITLE
10 Years Plus New Development 2

0 0.15 0.30 .75 1.5

DRAWING NO.
LB-00-304

PROJ. NO.
Project Number

SCALE
1 : 3000 @ A3

DRAWN BY
Author

ISSUE DATE

COMMERCIAL IN CONFIDENCE

DRAFT

NORTH

Runway 09/27

Runway 03/21

Future Runway

Old MELBOURNE Rd

Gas Pipeline easement

Gas Pipeline easement

Gas Pipeline easement

Scrubby Ln

Easterly Dr

Northern Ave

Airfield Rd

Valley Dr

Wilkins Ave

140m Strip line

90.0

140

42

30

H

-Terminal
-Aero club
-Aviation Museum
-Aviation Businesses
-Private Hangars, houses
-Emergency Services, Government
-Conservation Land
-New Developed Land
-New Tarmac
-Airport Zone Boundary
-Strip limitation

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PROJECT
Project Name

DRAWING TITLE
10 Years Plus Existing Development 3

0 0.37 0.75 1.87 3.75

DRAWING NO.
LB-00-305

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

DRAWN BY
Author

ISSUE DATE

NORTH

Gas Pipeline easement

Gas Pipeline easement

Old MELBOURNE Rd

Gas Pipeline easement

Future Runway

Runway 09/27

Scrubby Ln

Runway 03/21

140m Strip line

Easterly Dr

Northern Ave

Valley Dr

Airfield Rd

-Existing Area
-Existing Buildings
-Conservation Land
-Zone "A" Terminal related
-Zone "B" Medium to Large
-Zone "C" Small commercial business
-Zone "D" Private Hangars
-Zone "E" Emergency Services
-New tarmac
-Airport Zone Boundary
-Strip limitation

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PROJECT
Project Name

DRAWING TITLE
10 Years Plus New Development 3

0 0.37 0.75 1.87 3.75

DRAWING NO.
LB-00-306

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

DRAWN BY
Author

ISSUE DATE

NORTH

Runway 09/27

Runway 03/21

140m Strip line

Gas Pipeline easement

Gas Pipeline easement

Gas Pipeline easement

Old MELBOURNE Rd

Future Runway

Scrubby Ln

Easterly Dr

Northern Ave

Airfield Rd

Valley Dr

Wilkes Ave

H

-Existing Area
-Existing Buildings
-Conservation Land
-Zone "A" Terminal related
-Zone "B" Medium to Large
-Zone "C" Small commercial business
-Zone "D" Private Hangars
-Zone "E" Emergency Services
-New tarmac
-Airport Zone Boundary
-Strip limitation

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PROJECT
Project Name

DRAWING TITLE
20 Years plus

0 0.37 0.75 1.87 3.75

DRAWING NO.
LB-00-400

PROJ. NO.
Project Number

SCALE
1 : 7500 @ A3

DRAWN BY
Author

ISSUE DATE

Appendix C: TGN Runway Technical Study and Range Analysis

Latrobe Regional Airport (TGN)

Title	Note No.	01
Runway Technical Evaluation and Range Study	Revision	1
	Prepared by	CB
	Checked by	EC/AW
	Approved by	JL
Reference	Date:	02/09/2020
Technical Note		

1. Disclaimer

All physical characteristics relating to runway dimensions have been obtained from the Aeronautical Information Package (AIP) for Latrobe Regional Airport (TGN, YLTV), current as of August 2020 and accessed via Airservices Australia. Landrum & Brown (L&B) is not responsible for any conclusions brought about because of incorrect information obtained from the AIP.

All measurements and calculations are based on CAD drawings supplied by the *Latrobe City Council*. No warranty as to the accuracy of these drawings can be provided by L&B. Any future studies or work to be undertaken as a result of this study will require confirmation of the dimensions given in the CAD files with onsite measurements.

The PCN report supplied by council and conducted by *Airport Pavement Engineering Specialists Pty Ltd* does not guarantee a PCN rating of 9 or greater, as stated in the *Pavement Classification Number Reviewed* and shown below:

> **"An intrusive geotechnical investigation should be undertaken to verify these assumptions prior to the commencement of regular operations of any aircraft with an ACN (on subgrade D) of 9 or greater"**

At the request of Mr Marc Grant, Latrobe Regional Airport, Manager, Commercial & Operations, the assumption of a PCN strength of 15 has been assumed. This rating has been suggested as achievable by the pavement consultant given further testing. Any future studies or work to be undertaken as a result of this technical note will require invasive testing to be undertaken. The PCN report supplied is appended to the end of this technical note.

This technical note references the Manual of Standards (MoS) Part 139. This document is current as of August 2019 and therefore any reference to the material shown from here on may not be current. Any further work undertaken as a result of this study will require the most recent regulations to be applied.

2. Introduction

Purpose of this technical note

- Assess the current limitations of runway of 03R/21L at Latrobe Regional Airport (TGN) specifically assessing four aircraft: SAAB 340, ATR 42, Bombardier Q200, and the Bombardier Q300 in preparation for the possible introduction of regular public transport (RPT) services.
- Assess what modifications, if any, are required to make the runway and airfield infrastructure compliant for RPT services.
- Outline initial requirements for passenger and baggage screening.
- Conduct an aircraft range analysis to determine which airports are accessible by these aircraft given (1) the current runway infrastructure and (2) the proposed extensions per the masterplan

3. Executive Summary

The key findings of this report are:

- In its current configuration, runway 03R/21L cannot accommodate any of the aircraft chosen for this study in accordance with regulations set out in the MoS Part 139
- In order to accommodate the aircraft, excluding the SAAB 340 as a Code 3B aircraft, updates to the runway and main taxiway will have to be made, mainly:
    - Widening of the runway from 23m to 30m
        - including increasing the strip width to 140m (45m graded strip + 25m fly-over area from runway centreline)
    - Addition of a runway turn pad that allows 3m of clearance to the aircraft outer main gear
    - Addition of a runway end safety area (RESA) for runway 03R/21L
    - Increase of taxiway width from 10.6m to 15m
    - Increase of taxiway shoulder width from 15.9m to 25m
- Provisions to allow aircraft with an ARC of 3 or greater to use runway 03R/21L is impractical as this would require a strip width of 280m
    - This view was also expressed in the 2019 Masterplan
- Operation of a SAAB A340 may be possible without the 280-metre strip after discussions with CASA and formulation of an airline safety case for the airecraft.
- Any substantial changes to the existing runway will remove any existing “grandfather” rights used previously for RPT services.
- Baggage security will be required for RPT services and passenger security screening will be required for the smaller aircraft studied. The larger aircraft will require full security screening
- The existing apron area in front of the terminal can accommodate up to two aircraft simultaneously with interdependent parking spaces
- The current runway length of runway 03R/21L does not pose as an issue for the chosen aircraft in terms of obtaining their maximum range at full passenger capacity
- All aircraft chosen for this study can reach Sydney in New South Wales and Adelaide in South Australia directly. The ATR-42 and Dash 8-200/300 can also reach Brisbane and parts of central Queensland

4. Background

Latrobe Regional Airport (TGN) and the Latrobe City Council desired to undertake a study to determine the feasibility of future regular public transport (RPT) services at TGN. For this to be undertaken, the current physical, technical and regulatory limitations of the runway and associated infrastructure must be assessed to determine the viability of aircraft to conduct these services at the airport. Given the runway is not suitable for current RPT services, the Council would like to know what modifications and capital works would be required to meet the current regulations, in order to facilitate RPT.

Given the location and size of the airport, Council would like to know which airports are feasibly within range of TGN that could be serviced with an RPT service. This would allow a future route analysis to be undertaken to determine the most viable routes that could be proposed to airlines for a future service.

5. Technical Appraisal of Runway and Associated Infrastructure

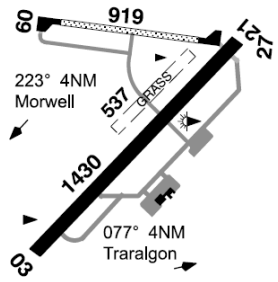
5.1. Introduction

Latrobe Valley Regional airport currently has three runways. The shortest runway is a grass surface that runs parallel to the largest and only sealed runway 03R/21L, the third runway is a non-intersecting gravel strip 09/27. At the request of the Latrobe Regional airport board, this project analysed the capability of runway 03R/21L and its associated infrastructure; and particularly looked at TGN's capacity to handle aircraft of varying sizes. The associated infrastructure refers to the taxiways in use for runway 03R/21L and the apron area in front of the terminal building. The existing capability has been determined in line with current operating standards as set out in the Manual of Standards (MoS) part 139 – Aerodromes of the *Civil Aviation Regulations 1998*. Information relating to the physical characteristics of runway 03R/21L at TGN are obtained from the Aeronautical Information Package (AIP), current as of May 2020. The relevant characteristics obtained from the AIP are presented below:

AIP Australia 13 AUG 2020 FAC YLTV - 1

LATROBE VALLEY **ELEV 180**

AVFAX CODE 3050



VIC UTC +10 YLTV

381226S 1462813E VAR 12 DEG E CERT

AD OPR Latrobe Regional Airport Board, PO Box 264, Morwell, VIC, 3840. PH 03 5128 5777: 0409 436 287. ARO 0408 038 285. Fax 03 5128 5672.

REMARKS

1. AD not AVBL to ACFT ABV 5,700KG without prior permission.
2. PPR for parking non-RPT ACFT ABV 5,700KG on sealed apron.
3. Helicopter Ambulance OPS H24.

PHYSICAL CHARACTERISTICS

03/21	033	47a	5700/450 (65PSI) Sealed	WID 23	RWS 90
09/27	085	30c	5700/450 (65PSI) Gravel. 72(236) E end, 58(190) W end Sealed.	WID 18	RWS 90

Figure 1: Latrobe Regional Airport AIP: FAC

RUNWAY DISTANCE SUPPLEMENT 13 AUG 2020 RDS YLTV - 1

LATROBE VALLEY

RWY	(CN)	TORA	TODA	ASDA	LDA
03	(2)	1430 (4692)	1490 (4888) (2.55%)	1430 (4692)	1430 (4692)
21	(2)	1430 (4692)	1490 (4888) (2.58%)	1430 (4692)	1430 (4692)

Figure 2: Latrobe Regional Airport: RDS

The runway conditions have been tested against 4 aircraft, chosen to best represent the most likely aircraft type that would see RPT services at TGN. These aircraft are as follows:

Table 1: Aircraft Mix Under Consideration

Aircraft Type	Aircraft Code	MTOW (kg)	OWE (kg)	TP (kPa)	ACN Value[1]	MoS Part 139 Aerodrome Reference Code	OMGWS (m)
SAAB 340	3B	13,358	8,259	820	9	B	6 - 8.99
ATR 42	2C	18,559	11,217	720	13	C	4.5 - 5.99
Bombardier Dash 8-Q200	2C	16,466	10,477	900	11	C	6 - 8.99
Bombardier Dash 8-Q300	2C	19,578	11,828	670	13	C	6 - 8.99

[1] Flexible Pavement @ Class D – 3% CBR
MTOW = Maximum Take Off Weight OWE = Operating Empty Weight
TP = Tyre Pressure ACN = Aircraft Classification Number
OMGWS = Outer Main Gears Wheel Span

Any failure in the current state of the runway or associated infrastructure, to meet the specifications outlined in the MoS Part 139 for a given aircraft will require works to be undertaken. If this is the case, the required works, to meet the standards for the given aircraft, have been presented.

5.2. Regulatory Setting: Runway

As mentioned in *Section 5.1*, the relevant standards are set out in part 139 of the Manual of Standards. The section of *Mos Part 139* relating to this technical note is contained in *Chapter 6 – Aerodrome Planning, Design and Maintenance – Physical Characteristics of Movement Facilities*. The relevant references referred to in this technical note are:

Division 1 – Runways

Chapter 6.01: Location of runway threshold

Chapter 6.02: Runway width

Chapter 6.03: Runway turn pad and runway bypass pad

Chapter 6.09: Runway surface

Chapter 6.10: Runway bearing strength

Chapter 6.11: Runway shoulders

Chapter 6.16: Runway strip length

Chapter 6.17: Runway strip width

Chapter 6.26: Runway End Safety Area (RESA)

Division 2 – Taxiways

Chapter 6.37: Taxiway width

Chapter 6.38: Taxiway edge clearance

Chapter 6.43: Taxiway bearing strength

Chapter 6.45: Width of taxiway shoulders

Chapter 6.48: Width of taxiway strip

Chapter 6.49: Width of graded area of taxiway strip

Division 4 – Aprons

Chapter 6.57: Location of Apron

Chapter 6.58: Separation distances on aprons

5.3. Regulatory Setting: Terminal

Introduction of RPT services may trigger a requirement to provide passengers and baggage screening within the terminal. Should security screening be required, it will necessitate physical changes to the terminal.

Aviation security is the responsibility of the Office Transport Security (OTS) and relevant Home Affairs Department security regulations.

The current state of regulation is slightly unclear and there would need to be consultation with Home Affairs and OTS if a decision on proceeding to RPT was made.

The basic guidelines are:

- No passenger screening if aircraft have fewer than 40 seats, however, baggage screening would be required.
- No passenger screening if aircraft have fewer than 40 seats and there is only a single carrier using the port. However, it is not clear if there would need to be screening if the second carrier used aircraft in the sub 20 seat range.

The table below summarises the terminal security requirements.

Table 2: Terminal Security Requirements

Aircraft Type	Seats	Pax Screening Required	Baggage Screening Required	Requirement Achieved
SAAB 340	34	No	Yes	**Partial**
ATR42	48	Yes	Yes	**No**
Bombardier Dash 8-Q200	36	No	Yes	**Partial**
Bombardier Dash 8-Q300	51	Yes	Yes	**No**

Baggage screening would be required for RPT operations, whilst passenger screening would be required for larger aircraft. The introduction of screening would require major spatial and structural; changes to be made within the terminal building.

Security fencing upgrades are also likely to be required adjacent to the terminal building.

5.4. Methodology

Each aircraft listed in *Table 1* has been compared against the standards as set out above in *Section 5.2* to test for compliance against the current runway and associated infrastructure. This analysis is presented below per each relevant division set out in *Chapter 6* of *MoS Part 139:*

Division 1 - Runways

Table 3: Division 1 – Runway Requirements Compliance

Description	MOS 139 Reference	Requirements	Requirement Achieved
SAAB 340			
Location of runway threshold	6.01	-	**Yes**
RWY Width	6.02	30m	**No**
RWY Turn pad	6.03	Clearance 3m	**No**
RWY Surface[1]	6.09	Min average texture depth = 0.625mm	**To be confirmed**
RWY Bearing Strength	6.10	ACN = 9	**Yes**
RWY Shoulders	6.11	Not required	**Yes**
RWY Strip Length	6.16	60m	**Yes**
RWY Graded Strip Width	6.17 (1)	90m	**Yes**
RWY Strip Width	6.17 (4)	280m	**No**
RWY RESA	6.26	90m	**No**
ATR42			
Location of runway threshold	6.01	-	**Yes**
RWY Width	6.02	23m	**Yes**
RWY Turn pad	6.03	Clearance 3m	**No**
RWY Surface[1]	6.09	Min average texture depth = 0.625mm	**To be confirmed**
RWY Bearing Strength	6.10	ACN = 13[2]	**Yes**
RWY Shoulders		Not required	**Yes**
RWY Strip Length	6.11	60m	**Yes**
RWY Graded Strip Width	6.16	80m	**Yes**
RWY Strip Width	6.17 (1)	140m	**No**
RWY RESA	6.17 (4)	60m	**No**
Bombardier Dash 8-Q200			
Location of runway threshold	6.01	-	**Yes**
RWY Width	6.02	30m	**No**
RWY Turn pad	6.03	Clearance 3m	**No**

Description	MOS 139 Reference	Requirements	Requirement Achieved
RWY Surface[1]	6.09	Min average texture depth = 0.625mm	**To be confirmed**
RWY Bearing Strength	6.10	ACN = 11[2]	**Yes**
RWY Shoulders		Not required	**Yes**
RWY Strip Length	6.11	60m	**Yes**
RWY Graded Strip Width	6.16	80m	**Yes**
RWY Strip Width	6.17 (1)	140m	**No**
RWY RESA	6.17 (4)	60m	**No**
Bombardier Dash 8-Q300			
Location of runway threshold	6.01	-	**Yes**
RWY Width	6.02	30m	**No**
RWY Turn pad	6.03	Clearance 3m	**No**
RWY Surface[1]	6.09	Min average texture depth = 0.625mm	**To be confirmed**
RWY Bearing Strength	6.10	ACN = 13[2]	**Yes**
RWY Shoulders		Not required	**Yes**
RWY Strip Length	6.11	60m	**Yes**
RWY Graded Strip Width	6.16	80m	**Yes**
RWY Strip Width	6.17 (1)	140m	**No**
RWY RESA	6.17 (4)	60m	**No**

[1] Preferred average texture depth = 1mm

[2] Given that invasive testing results in a PCN of 13 or greater

Division 2 - Taxiways

Table 4: Division 2 – Taxiway Requirements Compliance

Description	MOS 139 Reference	Requirements	Requirement Achieved
SAAB 340			
TWY Width (central sealed TWY)	6.37 (2)	15m	**No**
TWY Edge Clearance	6.38 (2)	3m	**Yes**
TWY Bearing Strength[1]	6.43	ACN = 9	**Yes**
TWY Shoulders	6.45 (1)	-	**Yes**
TWY Width Strip	6.48	20m	**Yes**
TWY Width of Graded Strip	6.49	12.5m	**Yes**
ATR42			
TWY Width (central sealed TWY)	6.37 (2)	10.5m	**Yes**
TWY Edge Clearance	6.38 (2)	2.25m	**Yes**
TWY Bearing Strength[1]	6.43	ACN = 13[2]	**Yes**
TWY Shoulders	6.45 (1)	25m	**No**
TWY Width Strip	6.48	26m	**Yes**
TWY Width of Graded Strip	6.49	11m	**Yes**
Bombardier Dash 8-Q200			
TWY Width (central sealed TWY)	6.37 (2)	15m	**No**
TWY Edge Clearance	6.38 (2)	3m	**Yes**
TWY Bearing Strength[1]	6.43	ACN = 11[2]	**Yes**
TWY Shoulders	6.45 (1)	25m	**No**
TWY Width Strip	6.48	26m	**Yes**
TWY Width of Graded Strip	6.49	12.5m	**Yes**
Bombardier Dash 8-Q300			
TWY Width (central sealed TWY)	6.37 (2)	15m	**No**
TWY Edge Clearance	6.38 (2)	3m	**Yes**
TWY Bearing Strength[1]	6.43	ACN = 13[2]	**Yes**
TWY Shoulders	6.45 (1)	25m	**No**
TWY Width Strip	6.48	26m	**Yes**
TWY Width of Graded Strip	6.49	12.5m	**Yes**

[1] Assuming taxiway bearing strength is the same as the runway

[2] Given that invasive testing results in a PCN of 13 or greater

Division 4 - Aprons

Table 5: Division 4 – Apron Requirements Compliance

Description	MOS 139 Reference	Requirements	Requirement Achieved
SAAB 340			
Location of Apron	6.57	Does not infringe OLS	**Yes**
Separation distances on aprons	6.58	3.0	**Yes**
ATR42			
Location of Apron	6.57	Does not infringe OLS	**Yes**
Separation distances on aprons	6.58	4.5	**Yes**
Bombardier Dash 8-Q200			
Location of Apron	6.57	Does not infringe OLS	**Yes**
Separation distances on aprons	6.58	4.5	**Yes**
Bombardier Dash 8-Q300			
Location of Apron	6.57	Does not infringe OLS	**Yes**
Separation distances on aprons	6.58	4.5	**Yes**

Given a larger runway strip width requirement to 140m, this will in turn change the obstacle limitation surfaces (OLS), requiring further analysis to be undertaken as to whether existing buildings infringe on the new surfaces. For a code 3 runway, the strip width requirement extends to 280m, taking up a considerable amount of developable land and existing infrastructure. As expressed in the 2019 Masterplan, it is impractical for runway 03R/21L to be designed to accommodate aircraft with an ARC of 3. The 2020 MoS requires a 280 metre strip for a Code 3 runway. Previous versions of MoS had a graduated strip width depending on runway width.

As part of the analysis of the existing apron, an apron capacity exercise was undertaken. This involved taking the physical characteristics of each listed aircraft and applying them to the apron in a manner that allows 2 aircraft to be parked simultaneously. This exercise is shown below:

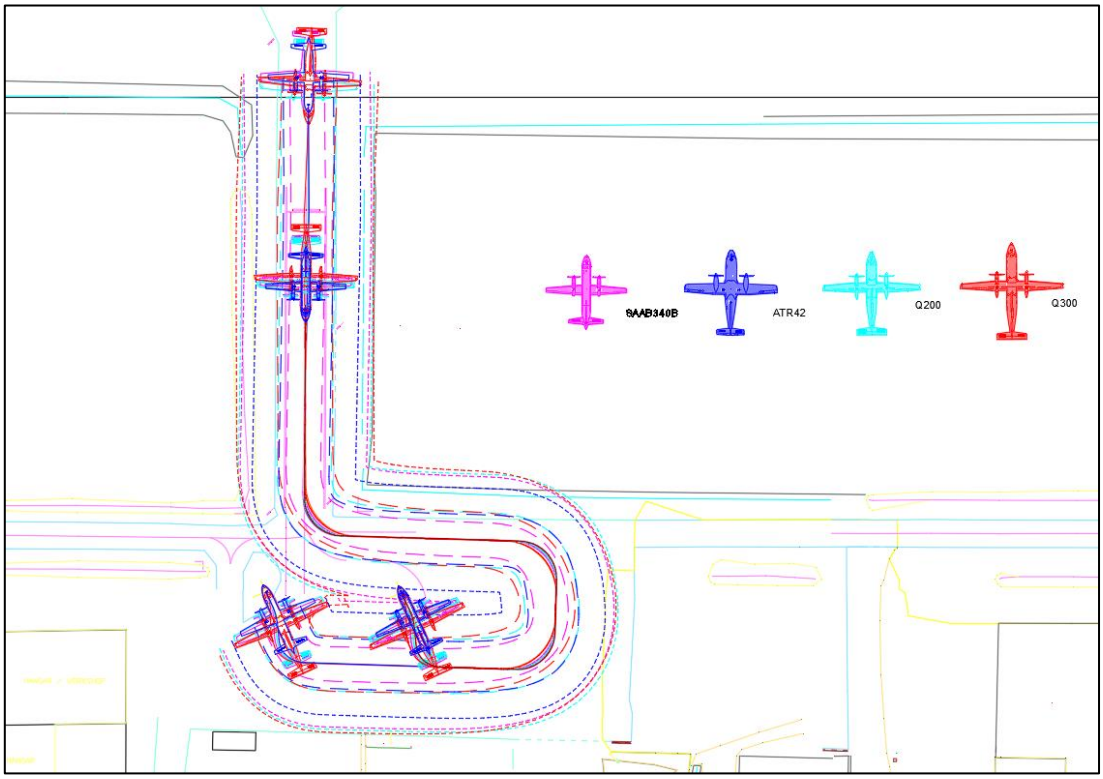


Figure 3: TGN Apron Existing Capacity Analysis

It was found that there is enough space on the existing apron to accommodate up to two Bombardier Dash 8-Q300's as shown above. In this configuration, the aircraft parking locations are said to be dependent of one another, such that the left-hand parking spot is only accessible when the apron is free. It should be noted that this analysis looks only at the apron, with existing taxiway unable to accommodate some aircraft.

5.5. Results

Each aircraft is listed below, clearly stating whether the existing runway and associated infrastructure can accommodate it under *MoS Part 139*.

Table 6: SAAB 340 – TGN Aerodrome Compliance Table

SAAB 340	
Description	**Requirements**
Can be used on existing runway?	**No**
If no, what is required?	30m RWY width
	RWY turn pad – 3m clearance
	90m RWY graded strip width
	280m RWY strip width
	90m RWY RESA
Can be used on existing taxiway	**No**
If no, what is required?	15m TWY widthr
Can be used on existing apron?	**Yes**

Table 7: ATR42 – TGN Aerodrome Compliance Table

ATR42	
Description	**Requirements**
Can be used on existing runway?	**No**
If no, what is required?	RWY turn pad – 3m clearance
	140m RWY strip width
	60m RWY RESA
Can be used on existing taxiway	**No**
If no, what is required	25m TWY shoulders
Can be used on existing apron?	**Yes**

Table 8: Bombardier Dash 8-Q200 - TGN Aerodrome Compliance Table

Bombardier Dash 8-Q200	
Description	**Requirements**
Can be used on existing runway?	**No**
If no, what is required?	30m RWY width
	RWY turn pad – 3m clearance
	140m RWY strip width
	60m RWY RESA
Can be used on existing taxiway	**No**
If no, what is required?	25m TWY shoulders
Can be used on existing apron?	**Yes**

Table 9: Bombardier Dash 8-Q300 - TGN Aerodrome Compliance Table

Bombardier Dash 8-Q300	
Description	**Requirements**
Can be used on existing runway?	**No**
If no, what is required?	30m RWY width
	RWY turn pad – 3m clearance
	80m RWY graded strip width
	140m RWY strip width
	60m RWY RESA
Can be used on existing taxiway	**No**
If no, what is required?	25m TWY shoulders
Can be used on existing apron?	**Yes**

Given that changes are essential to meet the requirements of each of the aircraft stated in *Table 1*, a table presenting each of the runway's existing conditions, along with the indicative requirements to achieve infrastructure compliant for the largest aircraft (Dash 8-Q300) and relative complexity of the task is presented below:

Table 10: TGN Runway Existing Conditions & Requirements

Description	MoS part 139 Reference	Current State	Required State	Complexity
Division 1 – Runway				
Location of runway threshold	6.01	achieved	achieved	-
RWY Width	6.02	23m	30m	**Hard**
RWY Turn pad	6.03	None	3m clearance from outer main gear	**Medium**
RWY Surface[1] *(Min average texture depth)*	6.09	To be confirmed	0.625mm	**Medium**
RWY Bearing Strength[2]	6.10	9	13	**Easy**
RWY Shoulders	6.11	Not required	Not required	-
RWY Strip Length	6.16	60m	60m	-
RWY Graded Strip Width	6.17 (1)	To be confirmed	80m	**Easy**
RWY Strip Width	6.17 (4)	90m	140m	**Medium**
RWY RESA	6.26	None	60m	**Medium**
Division 2 - Taxiways				
TWY Width (central sealed TWY)	6.37 (2)	10.8m	15m	**Medium**
TWY Bearing Strength	6.43	Same as runway	13	**Easy**
TWY Shoulders[3]	6.45 (1)	15.9m	25m	**Medium**
TWY Width Strip	6.48	26m each side	26m each side	-
TWY Width of Graded Strip	6.49	12.5m each side	12.5m each side	-

[1] Preferred minimum average depth = 1mm

[2] See disclaimer regarding runway PCN

[3] Runway width inclusive of shoulders to be not less than 25m

For ease of understanding the taxiway requirements, the figure below graphically depicts the required and existing taxiway dimensions with the associated *MoS Part 139* reference bracketed.

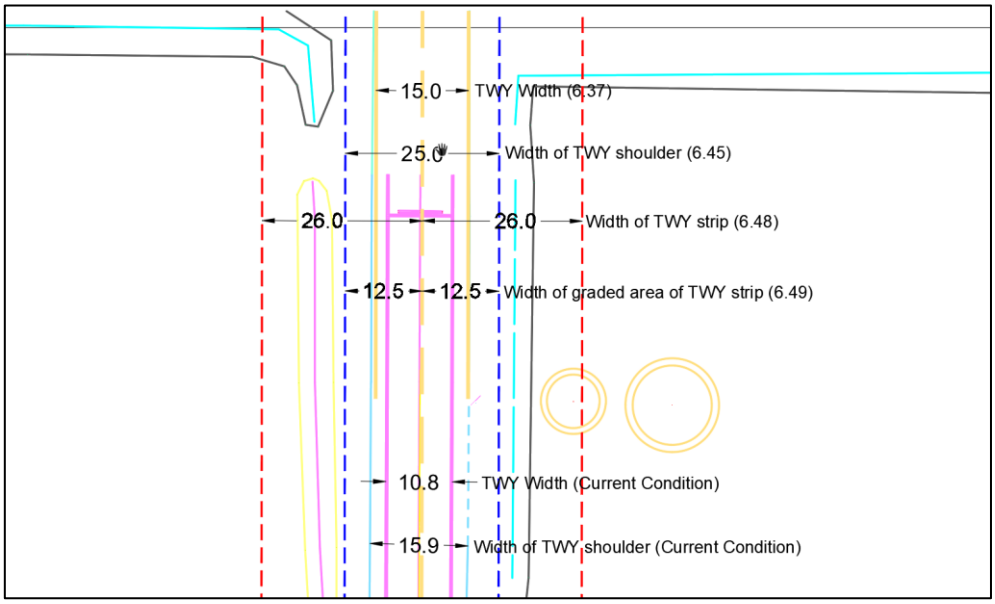


Figure 4: Taxiway Parameters - Existing and Required

5.6. Conclusion

In its current condition, runway 03R/21L and the associated infrastructure are not suitable for the four chosen aircraft to operate on given current legislation, as set out in the MoS Part 139. In order to accommodate these aircraft, the following changes must be made:

- Widening of the runway from 23m to 30m (including increasing the strip width to 140m)
- Addition of a runway turn pad that allows 3m of clearance to the aircraft outer main gear
- Addition of a runway end safety area (RESA) for runway 03R/21L
- Increase of taxiway width from 10.6m to 15m
- Increase of taxiway shoulder width from 15.9m to 25m.

Additionally, it should be noted that any changes the physical characteristics of the runway will result in any existing “grandfathering” rights to be abolished that were used for previous RPT services.

Analysis has shown that the existing apron area in front of the terminal can accommodate up to any two of the chosen aircraft at any given time. These parking spaces will be interdependent.

Baggage security will be required for RPT services and passenger security screening will be required for the smaller aircraft studied. The larger aircraft will require full security screening.

6. Aircraft Range Analysis

6.1. Introduction

Assuming the width and strength of the runway allow operations of all the aircraft listed in *Table 1*, a range analysis was performed to determine any limitations in payload or range based on the runway length. This analysis has been done for International Standards Atmospheric (ISA) conditions along with ISA+20°C, a standard upper limit for analysis of airports in Australia. If the aircraft require a runway length beyond what is listed in the AIP, an additional 150m will be added, in line with projects found in the airport masterplan.

6.2. Methodology

Using the aircraft planning manuals, the take off runway length required, given the maximum take-off weight (MTOW) is determined. Using the manufacturer graphs for changes in ambient temperature presented in the manuals, the temperature adjusted take off runway length required was also determined. The assumed take-off run available (TORA) of runway 03R/21L is 1,430m, as presented in the AIP and shown in *Figure 2*. It should be noted that for the ISA+20°C analysis, it is assumed flaps are set to 15°. If the Take of Runway distance required exceeds the TORA a weight penalty impacting the economical range would be calculated. If the TORA is greater than the take off runway distance required, the maximum range of the aircraft is then assumed. The range for each aircraft is then applied to TGN and an airport range table produced for each aircraft. This will be presented graphically for each aircraft in *Section 6.3*.

6.3. Results

Given the aircraft characteristics presented in their respective planning manuals at ISA conditions, all four aircraft have unrestricted range at ISA, meaning that field length required is below the TORA of runway 03R/21L. This is also true for these four aircraft when operating at ISA+20°C conditions. Therefore, the max range that can be achieved out of TGN for each aircraft given the aircrafts MTOW is the maximum range as presented in the aircraft manual. These ranges are presented below.

Table 11: Aircraft Range Analysis

Aircraft	Unrestricted ISA Field Length (m)	Maximum Range (km)
SAAB 340[1]	1,285	870
ATR-42	1,165	1,453
Dash 8-Q200	1,000	2,083
Dash 8-Q300	1,180	1,711

[1]Given 34 passengers with baggage at 97kg each

For each aircraft listed above, the airports that are within range of TGN are shown graphically below.

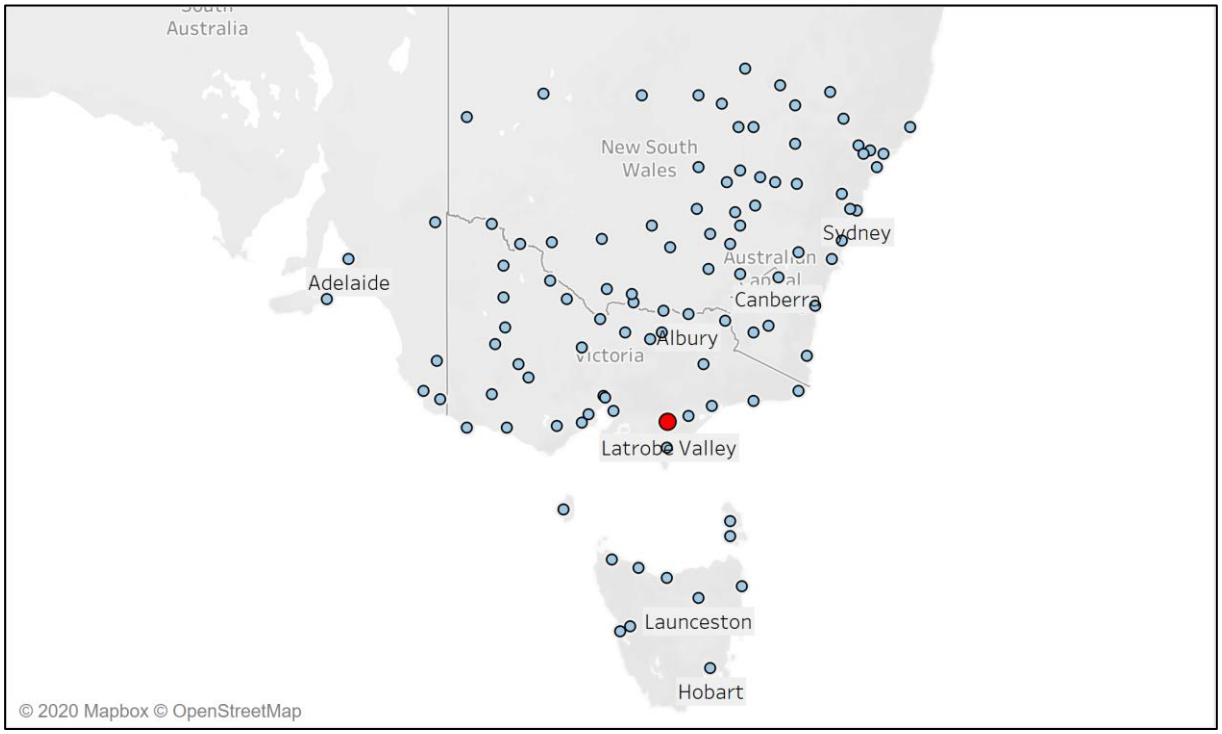


Figure 5: SAAB 340 Aircraft Range Map

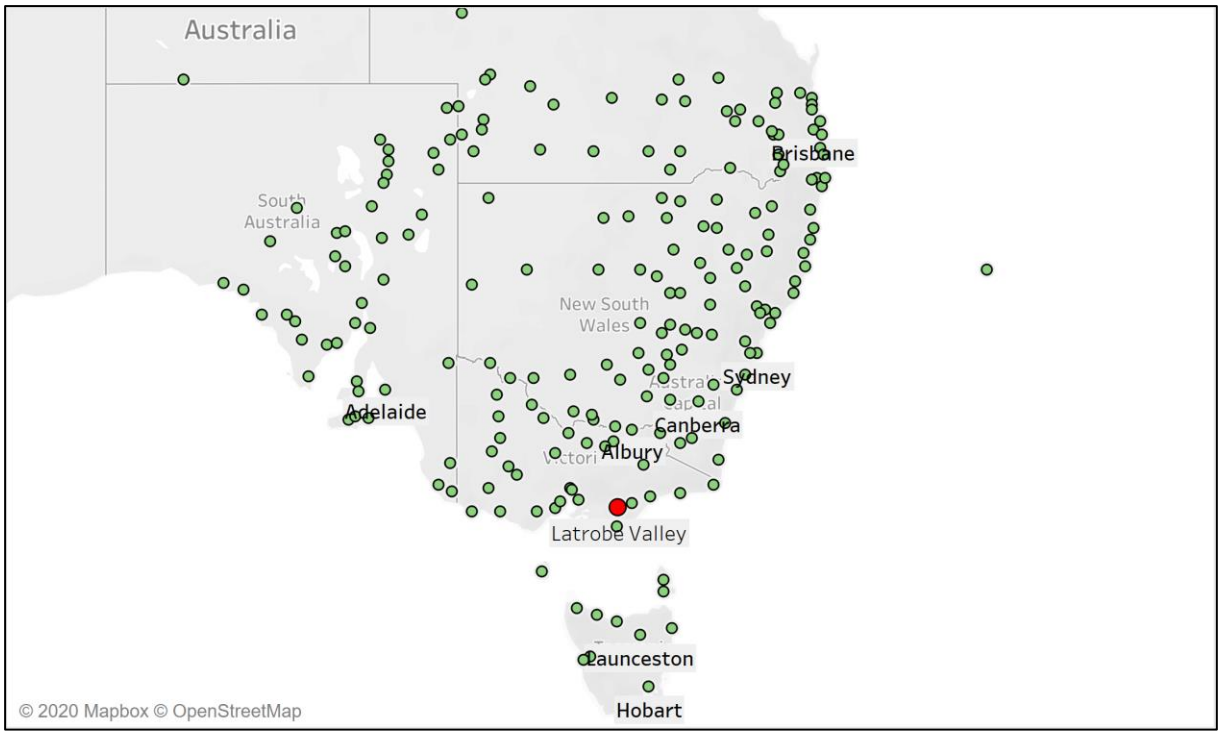


Figure 6: ATR-42 Aircraft Range Map

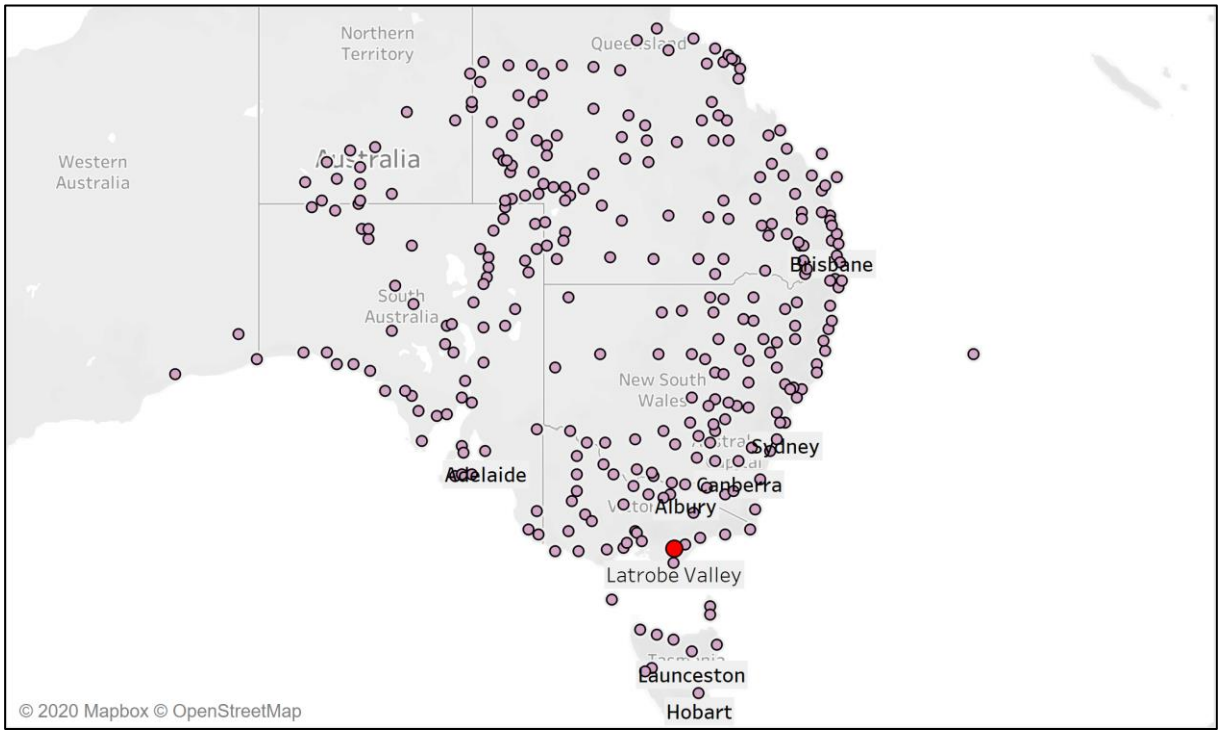


Figure 7: Dash 8-Q200 Aircraft Range Map

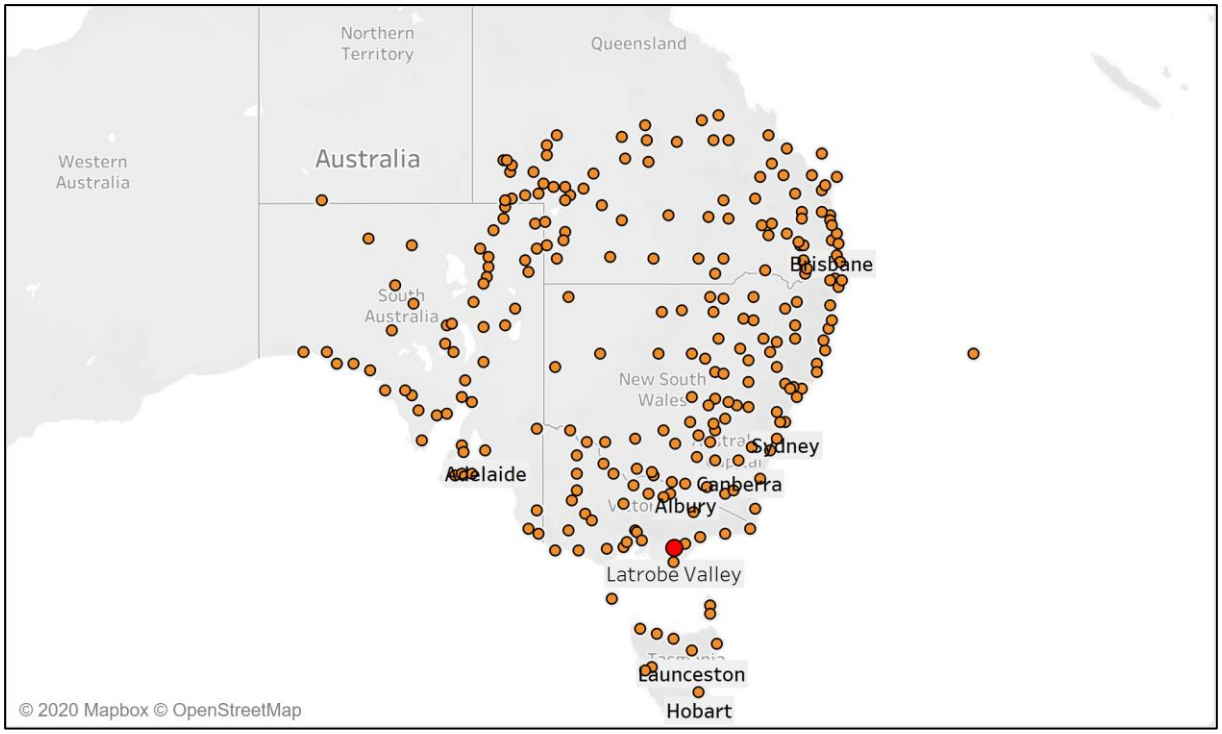


Figure 8: Dash 8-Q300

6.4. Conclusion

The result of the aircraft range analysis shows that all aircraft are capable of reaching as far as central New South Wales allowing direct flights to Sydney. To the west, all aircraft can reach Adelaide directly. Both the ATR-42 and Dash 8-Q200/300 can reach Brisbane and parts of southern Queensland with the Dash 8-Q200 capable of reaching into central Queensland.

Any future study to be undertaken as a result of this aircraft range analysis will need to take into account airport facilities, fuelling requirements along with any legislation surrounding RPT services.

7. Appendix A – Additional Aircraft Parameters

Figure 9: SAAB 340

Figure 10: ATR-42

Figure 11: Dash 8-Q200

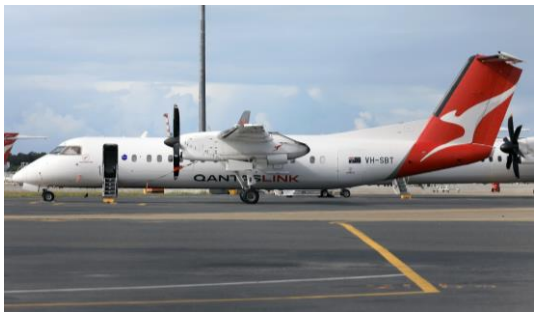


Figure 12: Dash 8-Q300

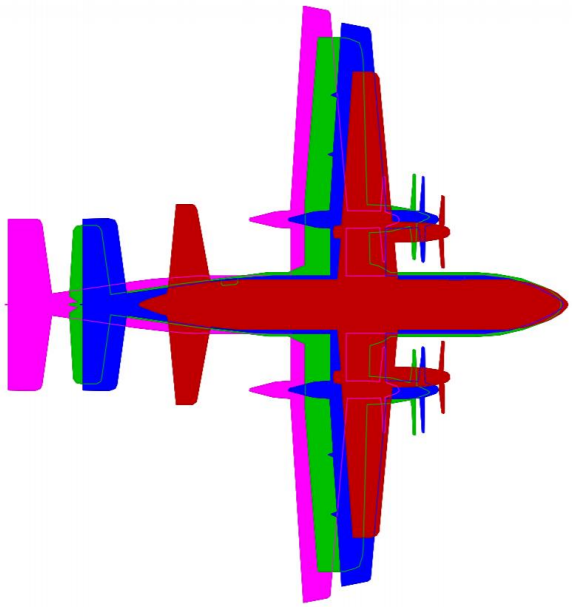


Figure 13: SAAB 340, ATR-42, Dash 8-Q200, Dash 8-Q300 Scale Comparison

Table 12: Aircraft Detailed Characteristics

Description	SAAB 340	ATR-42	Dash 8-Q200	Dash 8-Q300
Classification				
ICAO Code letter	C	C	C	C
EASA Code letter	C	C	C	C
FAA ADG	II	II	II	II
FAA TDG	3	2	3	3
IATA Type code	SF3	AT4	DH2	DH3
ICAO Designator	SF34	AT43	DH8B	DH8C
ICAO Wake Turbulence Category	M	M	M	M
Main Dimensions				
Over length (m)	19.73	22.67	22.25	25.68
Wingspan (m)	21.44	24.57	25.91	27.43
Tail height, min (m)	6.86	-	7.32	7.40
Tail height, max (m)	6.86	-	7.32	7.40
Wheelbase (m)	7.14	8.78	7.95	10.00
Nose to nose gear (m)	2.04	1.73	1.83	1.83
Nose to main gear centre (m)	9.18	10.51	9.78	11.83
Cockpit to main gear centre (m)	6.68	8.33	6.88	8.93
Main gear wheel span (m)	7.37	4.68	8.49	8.56
Outer engine span (m)	10.05	12.03	11.83	11.83
Turning Characteristics				
Nose gear angle, max (deg)	57.0	60.0	58.0	58.0
Noes gear turning radius, min (m)	8.51	10.14	9.37	11.79
Outer gear turning radius, min (m)	15.37	17.37	17.93	19.96
Other				
Seating capacity, max	-	52	39	56

8. Appendix B – Manual of Standards Part 139: Relevant Legislation

CHAPTER 6 AERODROME PLANNING, DESIGN AND MAINTENANCE — PHYSICAL CHARACTERISTICS OF MOVEMENT FACILITIES

Division 1 Runways

6.01 Location of runway threshold

1. Subject to this section, as far as possible, a runway threshold must be located at the extremity of a runway
2. A runway threshold must be located:
    a. for a code 1 runway — not less than 30 m; or
    b. in any other case — not less than 60 m;

    after the point at which the approach surface for aircraft using the runway meets the extended runway centreline.
3. Subject to subsection (2), a runway threshold may be displaced from the extremity of a runway if:
    a. the OLS would otherwise be infringed by an obstacle; or
    b. the PANS-OPS airspace would otherwise be infringed by an obstacle; or
    c. an immoveable object or structure would otherwise extend above the approach surface.

    Note 1 CASA Advisory Circular (AC) 139.A-04: Applying for aerodrome authorisations, exemptions and approvals, and AC 139.C-08: Aerodrome obstacle control, as existing from time to time and freely available on the CASA website, contain important guidance on the various safety factors that an aerodrome operator should consider before displacing a runway threshold.

    Note 2 Thresholds should not be displaced without consideration of aircraft operational factors, such as approach angle and LDA. Large approach angles (above 3.5 degrees) can only be flown by aircraft that have been certified for steep approaches and where the aircraft operator has received approval. Furthermore, displaced thresholds will result in a reduced LDA which may affect the safety and efficiency of the operation even if the approach angle remains at 3 degrees.
4. A runway threshold must be displaced from the extremity of a runway in accordance with a written direction by CASA given in the interests of aviation safety.
5. If a runway threshold is temporarily displaced, the aerodrome operator must:
    a. assess the revised approach splay for the OLS, and notify CASA in writing of any new obstacles in the approach surface; and
    b. recalculate the TODA, the critical obstacle gradient, and the STODA in the reciprocal direction from the displacement; and
    c. report any changes resulting from the recalculation to the AIS provider and request that a NOTAM be issued.
    d. The aerodrome operator must set out in the aerodrome manual the details of, and reasons for, any permanent runway threshold displacement.

6.02 Runway width

1. For a runway with a code number mentioned in a row of column 1 of Table 6.02 (1), the minimum width of runway for an aircraft with an OMGWS mentioned in the same row in column

2, 3, 4 or 5, is the width in metres mentioned in the cell that is common to the code number and the aircraft's OMGWS.

Table 6.02 (1) Minimum runway width

Code number	OMGWS			
	Up to but not including 4.5 m	4.5 m up to but not including 6 m	6 m up to but not including 9 m	9 m up to but not including 15 m
1	18 m	18 m	23 m	–
2	23 m	23 m	30 m	–
3	30 m	30 m	30 m	45 m
4	–	–	45 m	45 m

Note 1 OMGWS means outer main gear wheel span.

Note 2 The combinations of code numbers and OMGWS for which widths are specified have been developed for typical aeroplane characteristics.

Note 3 The choice of minimum runway width lies with the aerodrome operator having regard to the aircraft type which the facility is nominated to serve, bearing in mind that an aircraft must be operated in accordance with its aircraft flight manual or supplement which specifies the required minimum runway width. The minimum runway widths presented in Table 6.02 (1) do not guarantee that all aircraft types correlating to a code number and the corresponding OMGWS will be able to utilise the runway in accordance with the aircraft flight manual or supplement. Aerodrome and aircraft operators should consult with each other to ensure that aircraft may safely utilise the runway width provided at the aerodrome.

Note 4 The runway width determined in accordance with this MOS is normally considered to be the width of a runway of homogeneous runway surface material. If an aerodrome operator choses to provide a runway width consisting of non-homogeneous runway surface material, aircraft operations to the reported runway width may be limited. For example, a runway with an 18 m centre-sealed surface and 2.5 m of adjacent rolled gravel on each side is not considered to be a 23 m runway for the purposes of minimum width determination as documented in the aircraft flight manual or supplement.

2. A runway nominated as Code F for use by aircraft with at least 4 wing-mounted engines (that is, at least 2 engines on each wing) must:
    a. have a minimum width of 45 m; and
    b. have load-bearing shoulders in accordance with section 6.11.
3. For a precision approach runway — the runway width must not be less than 30 m.

6.03 Runway turn pad and runway bypass pad

1. If a runway turn pad or runway bypass pad is provided at any point on a runway, then, for an aircraft with an OMGWS mentioned in a row of column 1 of Table 6.03 (1):
    a. the minimum clearance of the outer main gear wheels of the aircraft from the edge of the relevant pad when carrying out a turn must not be less than the clearance mentioned in the same row in column 2; and
    b. the width of the relevant pad must be designed accordingly.

Table 6.03 (1) Minimum clearance between outer main gear wheels and edge of turn pad or bypass pad on runway

OMGWS	Minimum clearance
Up to but not including 4.5 m	1.5 m
4.5 m up to but not including 6 m	2.25 m
6 m up to but not including 9 m	3 m on straight portions

	3 m on curved portions — for aeroplanes with a wheelbase less than 18 m
	4 m on curved portions — for aeroplanes with a wheelbase equal to or greater than 18 m
9 m up to but not including 15 m	4 m

Note CASA recommends that the radius of the curve leading into and out of the runway turn pad or runway bypass pad should be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the relevant pad is intended. The intersection angle into the relevant pad should not be greater than 30 degrees. The relevant pad design should then guide the aeroplane in such a way as to allow a straight portion of taxiing before the point where a 180 degree turn is to be made. The straight portion of the relevant pad design, into and out of the relevant pad, should be parallel to the runway.

2. Subject to subsection (3), a runway turn pad or a runway bypass pad must be located on the right-hand side of a runway as viewed when looking in the direction of take-off from that runway end (the ***normal side***).

Note 1 This configuration would be viewed as being on the left-hand side by the pilot entering the runway turn pad or runway bypass pad, prior to the aircraft performing a reciprocal turn within the node, ready for take-off.

Note 2 See Figure 8.33 (1).

3. A turn pad or bypass pad may be located on the opposite side of a runway from the normal side as described in subsection (2), but only if:
    a. the presence of aerodrome facilities or infrastructure makes it impracticable to locate the turn pad or bypass pad on the normal side; and
    b. the placement on the side opposite the normal side does not adversely affect safety for the take-off and landing of aircraft; and
    c. the fact of placement on the side opposite the normal side is described and recorded in the aerodrome manual.
4. If:
    a. a taxiway shoulder in accordance with section 6.11 is required for a taxiway serving a runway; and
    b. an engine of an aeroplane using the turning node would otherwise travel outside the area defined by the turning node or the runway shoulder;

    then a shoulder must be provided to a minimum distance of 3 m from the runway turn pad, or runway bypass pad, edge, and the shoulder must:
    c. slope downwards and away from the relevant pad surface; and
    d. be resistant to aeroplane engine blast erosion; and
    e. be capable of supporting an aeroplane running off the relevant pad on to a shoulder without the aeroplane sustaining any structural damage; and
    f. be capable of supporting emergency and service vehicles; and
    g. either
        i. preferably be flush to the relevant pad edge; or
        ii. if not flush with the relevant pad surface — not step down by more than 25 mm.
5. A runway turn pad or runway bypass pad must ensure containment of the aircraft wingspan within the width of the applicable taxiway strip, as required under section 6.48.
6. An additional runway turn pad or bypass pad may be provided on the opposite side to that of the pad required under subsection (2).

Note Such a configuration may be required to allow an aircraft with a longer wheel base of oversteer characteristics to manoeuvre safely within the turning node or bypass node.

6.09 Runway surface

1. The surface of a sealed runway:
    a. must not have any irregularities that:
        i. excluding markings, impair the minimum runway surface friction required under paragraph (1) (b) or subsection (5); or

Note CASA recommends that paint which, when applied, would leave a thick film, should be avoided, for example, paint normally used for vehicle road markings.

ii. otherwise adversely affect the safety of take-off or landing; and

b. subject to subsection (5), must have:
   i. for an un-grooved surface — an average surface texture depth of at least that stated in column 1 of Table 6.09 (1)-1 over the full length and width of the runway, as measured using sand patch tests in accordance with subsection (2); or
   ii. for any surface — a minimum measured coefficient of friction level greater than the minimum friction level specified in Table 6.09 (1)-2; and

c. if the surface is grooved — must have grooves that are:
   i. perpendicular to the runway centreline; and
   ii. if compliance with subparagraph (i) is not physically possible — parallel to transverse joints that are not perpendicular to the runway centreline; and
   iii. extended as close as possible to the runway edge.

Table 6.09 (1)-1 Average surface texture depth

Minimum average texture depth	Preferred average texture depth
0.625 mm	1 mm

Note Average means the average of results within a test area, and not results averaged across multiple test areas.

2. Tests that satisfy paragraph (1) (b) must be carried out in accordance with ICAO Airport Services Manual, Part 2, Pavement Surface Conditions, triggered by any of the following:
   a. as soon as possible after a newly constructed or overlayed surface is completed;
   b. as soon as possible after the application of a surface treatment or surface enrichment to any part of the runway;
   c. in accordance with a written direction from CASA;
   d. so that not more than 10 years elapses between any 2 tests.

Note For ICAO documents, see section 1.06.

3. Tests that satisfy subparagraph (1) (b) (i) must be carried out as follows:
   a. at intervals along the full length of the runway;
   b. at locations no more than 10% of runway length apart;
   c. at successive test locations on alternating sides of the runway centreline;
   d. at locations offset 4 m from the runway centreline except that the third test location on each side must be 1 m from the runway edge.
4. Grooving may be omitted within 100 m of the runway end provided paragraphs (1) (a) and (b) are both satisfied for the sections where grooving is omitted.
5. Despite paragraph (1) (b), for an aerodrome used for scheduled international air transport operations, the runway surface friction level must continuously achieve whichever of the following is applicable:
   a. for a new, renewed or reconstructed surface — unless impracticable, at least the preferred friction level specified in column 7 of Table 6.09 (1)-2, applied in accordance with subsection (6);
   b. for the maintenance planning of an existing surface — unless impracticable, at least the preferred friction level specified in column 6 of Table 6.09 (1)-2, applied in accordance with subsection (6);
   c. for any surface where it is impracticable to achieve the level specified in paragraph (a) or (b) — at least the minimum friction level specified in column 5 of Table 6.09 (1)-2, applied in accordance with subsection (6).

Note Subsection 1.08 (3) relevantly provides that a reference in a Table to a value that is ***preferred*** means that, as far as practicable, the use of the value is required in priority to another value expressed in the Table although the other value expressed must be used or observed if the preferred value is not used because it is impracticable to do so. Where the preferred value is not complied with, the aerodrome manual must contain a statement to that effect, the reasons for non-compliance, and the alternative value that is complied with.

Table 6.09 (1)-2 Friction values for continuous friction measuring devices

Test equipment	Test tyre pressure (kPa)	Test speed (km/h)	Test water depth (mm)	Minimum friction level	Preferred Maintenance Planning Level	Preferred Design objective (for new, renewed or reconstructed surfaces)
Mu-meter trailer	A 70	65	1.0	0.42	0.52	0.72
	A 70	95	1.0	0.26	0.38	0.66
Skiddometer trailer	B 210	65	1.0	0.50	0.60	0.82
	B 210	95	1.0	0.34	0.47	0.74
Surface friction tester vehicle	B 210	65	1.0	0.50	0.60	0.82
	B 210	95	1.0	0.34	0.47	0.74
Runway friction tester vehicle	B 210	65	1.0	0.50	0.60	0.82
	B 210	95	1.0	0.41	0.54	0.74
TATRA friction tester vehicle	B 210	65	1.0	0.48	0.57	0.76
	B 210	95	1.0	0.42	0.52	0.67
RUNAR Trailer	B 210	65	1.0	0.45	0.52	0.69
	B 210	95	1.0	0.32	0.42	0.63
GRIPTESTER trailer	C 140	65	1.0	0.43	0.53	0.74
	C 140	95	1.0	0.24	0.36	0.64

6. For the test equipment mentioned in a row of column 1 of Table 6.09 (1)-2, the minimum friction level for a test tyre pressure, test speed and test depth of water mentioned in the same row of columns 2, 3, and 4 respectively, is that mentioned in the same row of column 5, 6 or 7 that, in accordance with subsection (5), is for the particular pressure, speed or depth.
7. The surface of a grass, gravel or natural runway or runway strip:
    a. must meet the surface standards set out in Table 6.09 (7); and
    b. must not have any irregularities that:
        i. result in the loss of frictional characteristics; or
        ii. otherwise adversely affect the safety of take-off or landing.
8. For Table 6.09 (7), a surface characteristic mentioned in a row of column 1 must meet the standard for the characteristic mentioned in the same row in column 2 for runways, and column 3 for runway strips.

Table 6.09 (7) Standards for a grass, gravel or natural runway or runway strip

Surface	Runway	Runway strip
Maximum height of grass	150 mm	300 mm
Maximum size of isolated, loose stones on natural or constructed gravel surfaces	25 mm	50 mm
Maximum size of surface cracks (transverse)	40 mm	75 mm
Maximum size of surface cracks (longitudinal)	25 mm	75 mm

9. For subparagraph (1) (a) (ii), whether or not any irregularities adversely affect the safety of take-off or landing must be determined by a safety analysis using the safety management system or the risk management plan (as applicable).

6.10 Runway bearing strength

A runway must be capable of bearing the weights and aircraft movement frequencies of the types of aeroplanes which the runway is nominated to serve.

Note As required by paragraph 5.04 (1) (e), the pavement strength rating for a runway must be reported using the ACN – PCN pavement rating system.

6.11 Runway shoulders

1. For a code D, E or F runway, runway shoulders must be provided.
2. For a code D or E runway with a nominated OMGWS of not less than 9 m and up to but not including 15 m — the total width of the runway and the shoulders must not be less than 60 m.
3. Subject to subsection (4), a code F runway that has a nominated OMGWS of not less than 9 m and up to but not including 15 m must:
    a. be at least 45 m wide; and
    b. have at least 7.5 m shoulders on each side;

    but only if the engines of an aeroplane for which the runway is nominated would not otherwise overhang the runway shoulders.

    Note This configuration is normally acceptable for Code F aeroplanes with 2 or 3 engines.
4. A code F runway that has a nominated OMGWS of not less than 9 m and up to but not including 15 m must:
    a. be at least 45 m wide; and
    b. have at least 7.5 m ***runway shoulders*** on each side; and
    c. have at least 7.5 m ***additional shoulders*** on each outer side of the 7.5 m ***runway shoulders***;

but only if the engines of an aeroplane for which the runway is nominated would otherwise overhang the ***runway shoulders*** in the absence of the ***additional shoulders***.

Note This configuration is normally required for Code F aeroplanes with 4 or more engines.

5. Shoulders required by subsection (4) must be provided in the following configuration:
    a. a 7.5 m width of inner shoulder on each side of the runway capable of supporting any aircraft that runs off the runway;
    b. a 7.5 m width of additional shoulder on each outer side of the 7.5 m shoulders mentioned in paragraph (a), that are capable of:
        i. resisting engine blast erosion; and
        ii. supporting emergency and service vehicles.

Note Thus, the total width of the runway and the shoulders must not be less than 75 m.

6.16 Runway strip length

The graded area of a runway strip must extend before the threshold, and beyond the end of the runway or any associated stopway, for at least the following distances:

a. for a non-instrument code 1 runway — 30 m;
b. in any other case — 60 m.

6.17 Runway strip width

1. Subject to this section, the width of the graded area of a runway strip must not be less than that shown in Table 6.17 (1).
2. In Table 6.17 (1), for a runway with a runway code number mentioned in a row of column 1, the graded runway strip width is the width mentioned in column 2 for the same row.

Table 6.17 (1) Graded runway strip width

Runway code number (ARC)	Graded runway strip width

1 *Note* See also subsection 6.17 (3).	60 m
2	80 m
3 (if the runway width is 30 m)	90 m
3 (if the runway is used for scheduled international air transport operations); or 3 (if the runway width is 45 m or more); or 4	150 m

3. For a code 1 runway that has permanent lighting, the graded runway strip width must not be less than 80 m.
4. For a non-precision approach runway — the width of the runway strip, including the fly-over area, must not be less than that shown in Table 6.17 (4).
5. In Table 6.17 (4), for a runway with a runway code number mentioned in a row of column 1, the runway strip width, including the fly-over area, is the width mentioned in column 2 for the same row.

Table 6.17 (4) Runway strip width, including the fly-over area — non-precision approach runways

Runway Code Number (ARC)	Runway strip width, including the fly-over area
1 or 2	140 m
3 or 4	280 m

6. For a precision approach runway — the width of the runway strip, including the fly-over area, must not be less than that shown in Table 6.17 (6).
7. In Table 6.17 (6), for a runway with a runway code number mentioned in a row of column 1, the runway strip width, including the fly-over area, is the width mentioned in column 2 for the same row.

Table 6.17 (6) Runway strip width, including the fly-over area — precision approach runways

Runway Code Number (ARC)	Runway strip width, including the fly-over area
1 or 2	140 m
3 or 4	280 m

6.26 Runway end safety area (RESA)

1. Subject to subsections (2) and (3), a runway end safety area (***RESA***) must be:
   a. provided at the end of a runway strip; and
   b. prepared, constructed and maintained to:
      i. protect an aeroplane which undershoots or overruns the runway; and
      ii. ensure an aeroplane encounters no hazards if it runs off the runway; and
      iii. ensure the movement of ARFFS vehicles is facilitated.
2. Subsection (1) does not apply for a code 1 or 2 non-instrument runway.
3. Subsection (1) does not apply if CASA, in writing and on application, approves, with or without conditions, an engineering solution designed to ensure the safe deceleration of an aircraft in the event of a runway overrun.

4. The minimum length of a RESA is 60 m unless otherwise provided for in Table 6.26 (4).
5. In Table 6.26 (4), for a runway with a code number mentioned in a row of column 1:
    a. the minimum length of the associated RESA is that mentioned in the same row in column 2; an
    b. the preferred length of the associated RESA is that mentioned in the same row in column 3.

Table 6.26 (4) The minimum length of a RESA

Runway code number	Minimum length of a RESA	Preferred length of a RESA
1 or 2	60 m	120 m
3 or 4	90 m; or 240 m (if the runway is intended for scheduled international air transport operations)	240 m

6. A RESA must, as a minimum, be twice the width of the associated runway.
7. The slopes on a RESA must not exceed the following values:
    a. for the downward longitudinal slope — 5%;
    b. for the transverse slope — 5% upwards or downwards.
8. Transitions between different slopes on a RESA must be as gradual as possible.
9. No portion of a RESA may project above the approach or take-off climb surfaces of the runway.
10. A RESA must be free of fixed objects or structures, other than visual or navigational aids for the guidance of aircraft or vehicles.
11. Any fixed object or structure permitted to be on a RESA must be of low mass and frangibly mounted.

Note CASA recommends that within the graded area of the runway strip, constructions such as plinths, runway ends, paved taxiway edges etc. should be such as to avoid presenting a buried vertical face to aircraft wheels, in the runway direction in soft ground conditions.

12. When a runway is in use for take-off or landing, no mobile object may be on any part of a RESA.

6.37 Taxiway width

1. The width of a straight section of a taxiway must not be less than the width determined using Table 6.37 (1).

2. In Table 6.37 (1), for a taxiway with the OMGWS mentioned in a row of column 1, the minimum taxiway width of a straight section is the width mentioned in the same row in column 2.

Table 6.37 (1) Minimum width for straight section of taxiway

OMGWS	Minimum taxiway width (straight sections)
Up to but not including 4.5 m	7.5 m
4.5 m up to but not including 6 m	10.5 m
6 m up to but not including 9 m	15 m
9 m up to but not including 15 m	23 m

6.43 Taxiway bearing strength

The bearing strength of a taxiway must be:

a. at least equal to the bearing strength of the runway it serves;
b. otherwise capable of bearing the weights and movement frequencies of the types of aeroplanes which the taxiway serves.

6.45 Width of taxiway shoulders

1. The total width of the taxiway and the shoulders must not be less than the following (the ***minimum taxiway shoulder width***)
   a. for a code F taxiway — 44 m;
   b. for a code E taxiway — 38 m;
   c. for a code D taxiway — 34 m
   d. for a code C taxiway — 25 m.
2. The minimum taxiway shoulder width must be maintained along the whole length of a taxiway, including:
   a. on its curved sections; and
   b. at junctions and intersections with runways and other taxiways.

   Note The requirement in subsection (1) applies despite any increase in the surface width of the taxiway itself on its curved sections, or at junctions or intersections with runways or other taxiways.

6.48 Width of taxiway strip

The width of the taxiway strip

a. on each side of the centreline of the taxiway; and
b. measured from the centreline; and
c. along the full length of the taxiway;

must not be less than the following:

d. for a code F taxiway — 51 m;
e. for a code E taxiway — 43.5 m;
f. for a code D taxiway — 37 m;
g. for a code C taxiway — 26 m;
h. for a code B taxiway — 20 m;
i. for a code A taxiway — 15.5 m.

6.49 Width of graded area of taxiway strip

The graded area of a taxiway strip:

(a) on each side of the taxiway, including shoulders; and
(b) measured from the centreline of the taxiway; and
(c) along the full length of the taxiway;

must not be less than the following:

(d) for a taxiway where the OMGWS is less than 4.5 m — 10.25 m;
(e) for a taxiway where the OMGWS is at least 4.5 m but less than 6 m — 11 m;
(f) for a taxiway where the OMGWS is at least 6 m but less than 9 m — 12.5 m;
(g) for a taxiway where the OMGWS is at least 9 m but less than 15 m — 18.5 m where the code letter is D;
(h) for a taxiway where the OMGWS is at least 9 m but less than 15 m — 19 m where the code letter is E;
(i) for a taxiway where the OMGWS is at least 9 m but less than 15 m — 22 m where the code letter is F.

9. Appendix C – Latrobe Regional Airport: PCN Report

Attached as separate document

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Marc Grant
Airport Manager
Latrobe City Council

Latrobe Regional Airport – Pavement Classification Number Review

You asked that I review the PCN of the main runway at Latrobe Regional Airport. Because of their association with the aircraft using the main runway, the main taxiways and apron area are also effectively included in this assessment. The secondary and grassed runways and the minor taxiways associated with those runways were not considered.

Background

The airport's original development is not known but the main runway is 1,430 m long and 23 m wide, with lights located away from the runway edges to allow widening to 30 m in the future. The runway surface is stone mastic asphalt, which was constructed as a 50 mm nominal thickness overlay in 2015. The main taxiways and apron pavement were resurfaced with dense graded asphalt at around the same time.

According to ERSA, the current strength rating of the main runway is 5700/450, which means the pavement is limited to aircraft that are 5.7 tonnes in mass and a tyre pressure up to 450 kPa. The basis of the strength rating is not known.

Aircraft usage

Based on discussions with yourself and airport staff, I understand that there are no current RPT services or regularly charter flights. However, there is significant GA operations of a range of aircraft up to DC-3 in size. I also understand that the airport is subject to one-off charter and other one-off usage under Pavement Concessions, mainly based on the tyre pressure limit. The most significant historical usage is associated with the Saab 340A/B RPT serviced operated by various airlines over the years. Generally, 6 arrivals and departures per week operated for approximately 15 years. This historical usage will be considered in determining an appropriate PCN.

Pavement condition

I inspected the runway, main taxiways and main apron area on 26 May 2020. The pavements are generally in excellent condition. The surface is typically shown in the following image.

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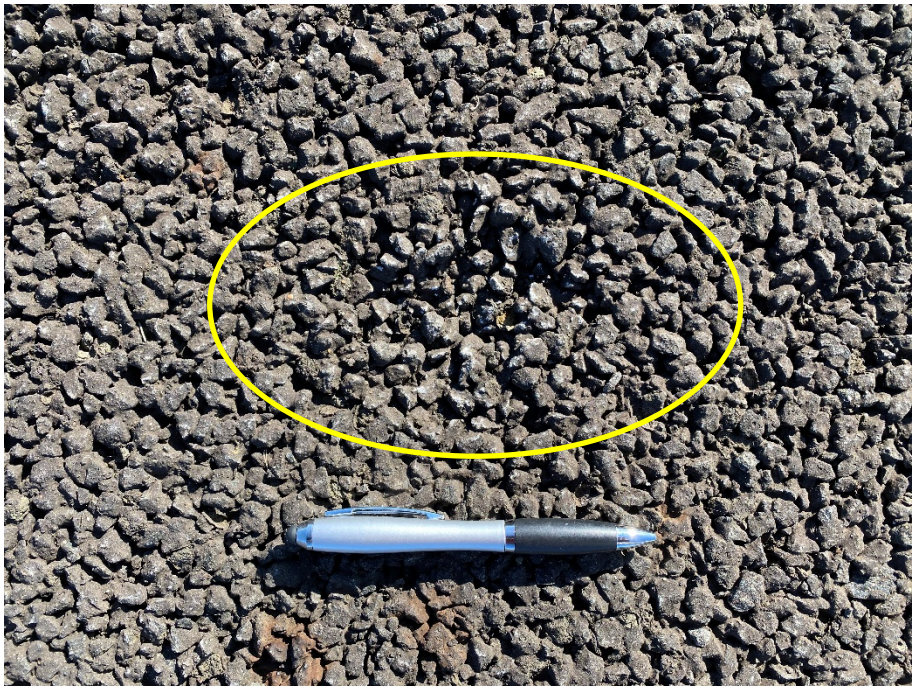
The surfaces are free from cracks and depressions, with only minor and isolated blemishes in the surface. An example is shown in the following images, the first of which shows shallow erosion and the subsequent shows isolated bleeding.



With minor maintenance, the current surfaces are expected to remain serviceable for another 10 years or more.

Pavement structures

The pavement structures are not documented. I understand that the original runway was approximately 1,000 m long and it was extended to the south-west by around 400 m in 1990. The existing runway was provided with a 60 mm asphalt surface at that time. Subsequently, in 2015, the runway, taxiway and apron were resurfaced with 50 mm of asphalt, as detailed above. As a result,

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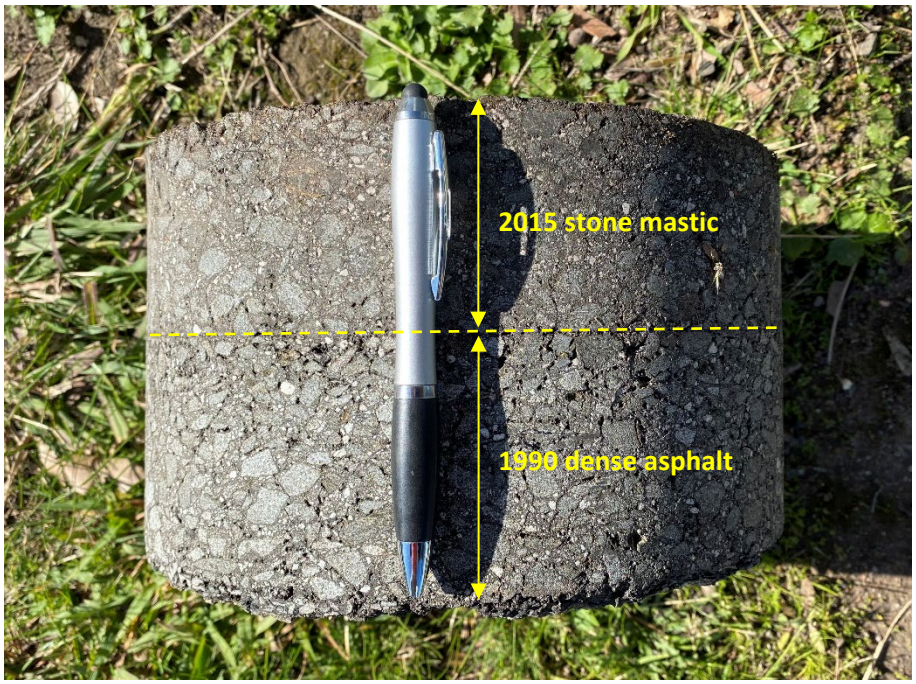
the older portion of the runway has 110 mm of asphalt, which was evidenced by retained AGL cores, which I inspected while on site, and shown in the following image.



The taxiway, apron and extended runway pavement structures are not known, but it is expected that they would all be of comparable strength.

The existing pavement structure has been estimated based on available information. For a runway to have a sound asphalt surface but a relatively low (450 kPa) tyre pressure limit is unusual. Similarly, any runway pavement that has received two asphalt overlays to be limited to 5,700 kg aircraft is also unusual. I therefore suspect that the original runway was appropriately designed and rated for 5,700 kg aircraft. When the 1990 and 2015 works were completed, which added significant strength to the original pavements, it is likely that the strength rating was simply not updated. On that basis, it is reasonable to assume that the original portion of the runway has a pavement structure that is 110 mm of asphalt over a sprayed seal and granular pavement that was already suitable for 5,700 kg aircraft. It is also reasonable to assume that the 1990 runway extension provided a pavement structure that is at least as strong as the original portion of the runway.

Pavement strength assessment

Before the upgraded runway strength is determined, it is important to estimate the original pavement composition. Based on the general geology of the area and given the proximity and PCN rating of West Sale airport, it is assumed that the prevailing subgrade is a category D (characteristic CBR 3). Using the software APSDS, the thickness of gravel required to support a 10,000 passes of a generic 5,700 kg aircraft with 450 kPa tyre pressure on CBR 3 subgrade is 405 mm.

Therefore, I assume that the current pavement structure includes:

- 110 mm asphalt.
- 400 mm gravel.
- CBR 3 subgrade.

Assuming 10,000 passes, which is approximately equal to one departure per day for twenty years, APSDS was used to determine the adequacy of the current (assumed) pavement structure for various aircraft types. The adequacy is expressed by the parameter known as the cumulative damage factor, or CDF. A CDF of 1.0 indicates an optimum pavement predicted to fail at the end of the forecast aircraft movements. A CDF that exceeds 1.0 indicates a pavement will fail ahead of aircraft traffic. For example, a CDF of 2.0 would indicate that the pavement will fail after half the forecast traffic has occurred.

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Common aircraft and the current pavement's adequacy to accommodate them are summarised in the following table. Green indicates low risk, orange indicated moderate risk and red indicates extreme/high risk of pavement failure.

Aircraft	Operating Mass (t)	Tyre Pressure (kPa)	ACN (on subgrade D)	CDF
Saab 340 B	12.3	660	8.3	0.08
Shorts 330	10.4	545	9.2	0.09
DC-3	12.2	310	9.9	0.38
Dash 8-100	15.5	810	10.3	0.89
Dash 8-300	18.6	860	12.7	8.2

It is noted that different sources of aircraft information publish slightly difference aircraft masses and tyre pressures, which affects the ACN values calculated. Based on the above, It would appear to be appropriate to set the PCN of the main runway to be equal to the ACN of the DC-3.

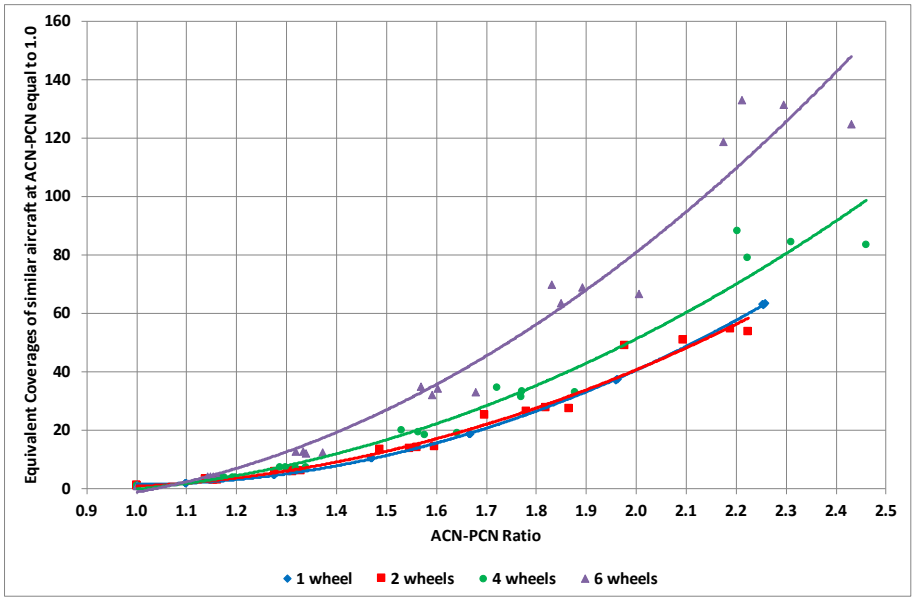
It is noted that the tyre pressure limit is intended to protect the surface of the pavement. Because the current surface is a high quality stone mastic asphalt in excellent condition, a tyre pressure limit is almost irrelevant. It is also common for small jet aircraft to have a high tyre pressure and a low weight. There is no reason to restrict these aircraft from using the main runway at Latrobe airport and an increase in the tyre pressure limit to 990 kPa is easily justified. On that basis, the published PCN would be: PCN 10/F/D/900/T.

Impact of load repetitions

Aircraft pavement strength requirements are sensitive to the weight of aircraft but insensitive to the frequency of operations. The CDF values in the table above can be used to estimate the increase in number of operations of the various aircraft that could be accommodated by the current pavement structure. With a CDF of 0.89, the Dash 8-100 could only increase in frequency by 10% (above the one per day for 20 years that was assumed). However, with a CDF of 0.08, the Saab 340B aircraft could operate at 12.5 times the estimated frequency. That is, it could operate 87 times per week for 20 years before the pavement becomes unacceptable. Similarly, the DC-3 could operate 2.5 times more often than forecast, at 17 times per week.

Impact of Pavement Concessions

As stated above, the impact of an aircraft on a pavement structure is sensitive to the aircraft weight. This is reflected in the ACN, but the relationship between ACN and pavement damage is not linear, it is exponential, as generally shown in the following figure.



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On that basis, I generally suggest that Pavement Concession requests be considered as follows:

- Up to 10% overload. Permitted on a routine basis, nominally up to 20 landings per year.
- 10-25% overlay. Permitted on a restricted basis, nominally up to 5 landings per years.
- 25-50% overload. Permitted only for special purposes and only after a period of dry weather and subject to inspections and engineering assessment.
- Above 50% overload. Not permitted except in emergencies.

I note that the above Pavement Concession advice is based on the PCN number, that is, the suggested PCN 10. However, because of the sound condition of the high quality asphalt surface, I would not hesitate to allow Pavement Concessions based on tyre pressure up to 1,400 kPa, which is the tyre pressure of a B737.

Conclusion

It appears that the current pavements at Latrobe Regional Airport are under-rated because the PCN was not updated after the 1990 or 2015 projects. Based on the analysis presented above, I have determined that the true PCN of main runway is likely to be PCN 10/F/D/990/T. This is considered to be representative of low risk on the basis of the two overlays provided since 1990, the historical use of by the Saab 340B aircraft and the ongoing occasional use by the DC-3, with the complete absence of any symptoms of structural distress.

However, I note that the above assessment is based on the assumptions that the current 5,700 kg strength limit was based on the pavement that existed before the two asphalt overlays, that the runway extension is at least equivalent in strength and that the apron and taxiways were similar overlayed and that the bearing strength of the subgrade is CBR 3. An intrusive geotechnical investigation should be undertaken to verify these assumptions prior to the commencement of regular operations of any aircraft with an ACN (on subgrade D) of 9 or greater. In the interim, it may be appropriate to publish a PCN of PCN 9/F/D/990/T, which would allow the Saab 340A/B to recommence operations without a Pavement Concession.

If you have any questions regarding this report, please don't hesitate to be in touch.

Regards,

Greg White
PhD, MEng, ME, MTech, BE(Civil), CPEng, RPEQ
Airport Pavement Engineering Specialists Pty Ltd

28 May 2020

Appendix D: TGN RPT Stakeholder Consultations

Latrobe Regional Airport (TGN)

Title	Note No.	02
Future RPT Services Stakeholder Consultation	Revision	1
	Prepared by	CB
	Checked by	JAL
	Approved by	
Reference	Date:	26/10/2020
Technical Note		

1. Disclaimer

All information contained within is based on interviews and discussions conducted. Any information and/ or data is based on the recollection of the interviewee and may need separate verification.

2. Introduction

Purpose of this technical note

- Engage with regional stakeholders to determine local appetite for RPT services (business or tourism) along with future subsidies of airline routes
- At a high level, identify the drivers of passenger demand in each respective region
- Identify potential businesses in the Gippsland region that may be able to generate sufficient traffic for interstate RPT services
- Engage with comparative regional airports with interstate services to determine the key market drivers and success factors for implementing such a service

3. Executive Summary

Major points from consultation with local councils: Latrobe, Baw Baw, South Gippsland.

- Baw Baw and South Gippsland focused on Melbourne 3rd airport in South East (Tooradin/Koo Wee Rup) though this is seen as long term.
- Previous Latrobe RPT services considered expensive as the market is cost sensitive.
- Perceived benefits to inbound tourism as interstate and international tourism visitation rates are low, though tourism is not seen as a key driver for inbound services.
- South Gippsland saw scope for development as a “foodie” destination
- Scope for air cargo – largely high value and perishable – horticulture, seafood, etc.
- Western Baw Baw Shire is seen as more oriented to Melbourne with Eastern Baw Baw most likely to use Latrobe – Airport at TGN seen as a benefit to this latter market.
- Intra Victorian flights (Bendigo, Ballarat, Mildura) would open market opportunities as centres are in 4-hour + range – travel beyond Melbourne from the region is seen as problem.
- If Latrobe is to be the “Gippsland” airport, there is an issue that Gippsland is ill defined in the public mind.

Major points from consultations with regional bodies: Committee for Gippsland, Destination Gippsland, Federation University.

- Bodies focused on Melbourne 3rd airport in South East (Tooradin/Koo Wee Rup) though this is seen as long term.
- Destination Gippsland see no tourism benefit from RPT services – focus on current travel patterns and modes.
- Destination Gippsland identified key tourist drivers in the region – Wilsons Promontory, Gippsland Lakes and Croajingalong Wilderness.
- Stakeholders see advantages but no great driver for RPT use.
- High value cargo and freight could be a user.
- Major projects such as Project Marinus or Star of the South may give RPT a kickstart
- Multiple mentions that Bairnsdale are investigating RPT flights – indication that these would be MEL focused.
- Committee for Gippsland suggested that an airport in Sale would be more centrally located and draw on Defence traffic. Suggestion was that RAAF East Sale could become joint military / civil facility.

Major points from regional airports:

- Key success factors
  - Good airline relationships
  - Scheduling that responds to business market
  - Reliability of service
  - Targeted ticket price
  - Low parking prices and ease of access – especially if there is a major city overlap
- Major Commonalities across all airport
  - Business travel outbound was initial major driver with some development of inbound business and leisure travel later.
  - Interstate access opened opportunities for local business
  - Insignificance of cargo / freight
  - 4 hours is key tipping point when flying is preferred to driving

- Largely turbo-prop services (except Wellcamp)
- 1-hour drive is main catchment but sometimes longer

4. Background

Latrobe Regional Airport (TGN) and the Latrobe City Council have commissioned a study to ascertain the feasibility of future regular public transport (RPT) services at TGN. This involves exploring the underlying demand for RPT services to and from TGN and the wider Gippsland region. This study will draw on possible destination outputs from part 1 of this study which has been submitted as a Technical Note 01 titled "*Runway Technical Evaluation and Range Study*".

For this to be undertaken, the study has considered potential traffic between TGN (Gippsland region) and these ports. This has been based on desktop research, stakeholder consultation, and analysis to determine market opportunities, propensity to travel among other drivers for RPT services.

This data will form the basis of further analysis that may go into the business case to be put to airlines that may consider providing RPT services from Latrobe Airport.

5. Stakeholder Consultations with Local Councils

As part of the stakeholder consultation process, local councils in the Gippsland region were contacted to ascertain if there was an appetite amongst the councils and local communities for the introduction of RPT services at Latrobe. The questions put forward to the councils were:

- Would it be used?
- Who would use it?
- What benefits would it bring to the region?
- Could Latrobe Airport be an entry point focus for Gippsland?

The following councils were consulted with as part of the consultation process:

- Latrobe Regional Council
- Baw Baw Shire Council
- South Gippsland Shire

The following sections detail the findings of each consultation.

5.1 Latrobe Regional Council

Name	Organisation	Position	Date	Email
Bruce Connolly	Latrobe City Council	Manager Business Development, Regional City Growth and Investment	10/09/2020	Bruce.Connolly@latrobe.vic.gov.au

- Recap on previous services from TGN. These were operated by Hazelton and Rex. Services were TGN – HBA (driven by Basslink development and construction), and a TGN – Albury (ABX) – Canberra (CBR) triangle.
- Previous services were seen as expensive and ticket prices too high for leisure travel.
- Agreement that any future services would need to be driven by business and that any leisure may follow.

5.2 Baw Baw Shire Council

Name	Organisation	Position	Date	Email
Melissa Moseley	Baw Baw Shire	Business Development Officer	25/09/2020	Melissa.Mosely@Bawbawshire.vic.gov.au

- Baw Baw focused on Melbourne 3rd airport in South East (Tooradin/Koo Wee Rup) though this is seen as long term.
- Previous Latrobe RPT services considered expensive as the market is cost sensitive.
- Perceived benefits to inbound tourism as interstate and international tourism visitation rates are low, though tourism is not seen as a key driver for inbound services.
- Scope for air cargo – largely high value and perishable – horticulture, seafood, etc. Access to transport including air transport raised by new businesses looking to invest in the region.
- Western Baw Baw Shire is seen as more oriented to Melbourne with Eastern Baw Baw most likely to use Latrobe – Airport at TGN seen as a benefit to this latter market.
- Intra Victorian flights (Bendigo, Ballarat, Mildura) would open market opportunities as centres are in 4-hour + range – travel beyond Melbourne from the region is seen as problem.
- If Latrobe is to be the “Gippsland” airport, there is an issue that Gippsland is ill defined in the public mind. Visitors to Baw Baw Shire don’t see it as Gippsland though the locals do.

5.3 South Gippsland Shire Council

Name	Organisation	Position	Date	Email
Ken Fraser	South Gippsland Shire	Coordinator Economic Development and Tourism	15/09/2020	kenf@southgippsland.vic.gov.au

- South Gippsland Shire is a 1-hour drive from TGN
  - Need to factor in drive time to airport from other councils
  - Having services to TGN as opposed to somewhere closer in seen as a negative for South Gippsland Shire
- Biggest attractions in Gippsland are seen to be Wilsons Prom and Phillip Island
- Gippsland is currently a “lower end” tourism market
  - No high-quality accommodation

- Any form of RPT service will likely be driven by businesses rather than tourism
    - Large dairy industry
    - Large agriculture industry
        - Saputo Dairy
    - Two big long-term projects about to start construction in Gippsland
        - Star of the South Offshore Windfarm
        - Project Marinus undersea cable to Tasmania
- Melbourne's 3rd airport brought up in discussion
- Council would show interest if service was put forward to TGN
    - Would need a cost benefit analysis for the council to invest in the service
- There has been talks before about the freighting of food products
    - These would have to be high value perishable goods
        - Eg. Snow peas
    - Possibility for horticulture and wine

6. Stakeholder Consultations with Regional Bodies

As part of the stakeholder consultation process, regional bodies in the Gippsland region were contacted to ascertain if there was an appetite amongst the councils and local communities for the introduction of RPT services at Latrobe. The questions put forward to these bodies were:

- Would it be used?
- Who would use it?
- What benefits would it bring to the region?
- Could Latrobe Airport be an entry point focus for Gippsland?

The following councils were consulted with as part of the consultation process:

- Regional Development Victoria
- Committee for Gippsland
- Destination Gippsland
- Federation University

Attempts were made to contact the Star of the South Windfarm and Project Marinus but these were unsuccessful.

The following sections detail the findings of each consultation.

6.1 Regional Development Victoria

Response from **Kylie Gore** over email:

- "*To date, a regional air service has not emerged as a priority for the local community in our 4 years of consultations*"

6.2 Committee for Gippsland

Name	Organisation	Position	Date	Email
Jane Oakley	Committee for Gippsland	CEO	25/09/2020	Jane.oakley@gipps.com.au

- The Committee for Gippsland does see a benefit to regular RPT services to the Gippsland region
    - Three members of the committee in in Koo Wee Rup are looking for a service
    - Members are advocating such that a service provides access for freight
    - Melbourne's 3rd airport in Tooradin/Koo Wee Rup would be better placed
        - 1.5-hour drive there not seen as a negative as it is better than the drive to Melbourne Airport
    - The service will likely not be to Canberra as people in East Gippsland would be better to drive
- Potential business users for an RPT service:
    - OPAL – head office in NSW
    - Manufacturing – import of rubber from Asia
    - Solar panels from SA – import and travel
    - Project Marinus/Start of the South
    - Food production
- It is understood that local businesses will generally have no business case to support an RPT service

6.3 Destination Gippsland

Name	Organisation	Position	Date	Email
Terry Robinson	Destination Gippsland	CEO	14/09/2020	trobinson@destinationgippsland.com.au

- Comments regarding East Gippsland
    - Lakes Entrance are looking to upgrade their airport
    - There has been interest from East Gippsland for RPT services

        - Currently in talks with REX
    - See's East Gippsland as a better location for a service as this provides better access to Wilsons Prom
- Destination Gippsland has been asked to support the Melbourne 3rd airport in the Tooradin/Koo Wee Rup area
- Comments regarding tourism in Gippsland
    - RPT services has never been a high priority
    - A large majority of tourists are private vehicle or coach
        - See a lot of Melbourne to Sydney travellers with a "self-drive" itinerary through Gippsland
    - Asian markets don't go past Phillip island and Wilsons Prom
        - Almost always via coach
    - Gippsland is not a year-round destination for tourism
    - Tourism alone will not sustain an air service
    - The western markets do some self-drive trips (UK, NZ)
- There is limited public transport through Gippsland which is often unreliable
- There is demand for intra Gippsland travel
    - Traralgon to Metung/Lakes Entrance

6.4 Federation University

Name	Organisation	Position	Date	Email
Leigh Kennedy	Federation University	Head of Campus	14/10/2020	l.kennedy@federation.edu.au

- 230 staff at Churchill campus
    - Very limited travel demand from staff
    - Campus in Brisbane – none if any cross-campus travel
- Mots students from the Gippsland region (1,700 all up)
    - 150 international students mostly at post grad level
- Uni currently going through a rebranding
    - Move towards renewable energy research which could lead to future travel demand although would still be very limited
- Leigh can see a benefit for freight
    - Would need to be fast moving goods
    - Would be better placed in East Gippsland

7. Stakeholder Consultations with Regional Airports

As part of the stakeholder consultation process, regional airports that have introduced interstate services were contacted to understand what the key market drivers, success factors and airline incentives used that resulted in commencement of these services.

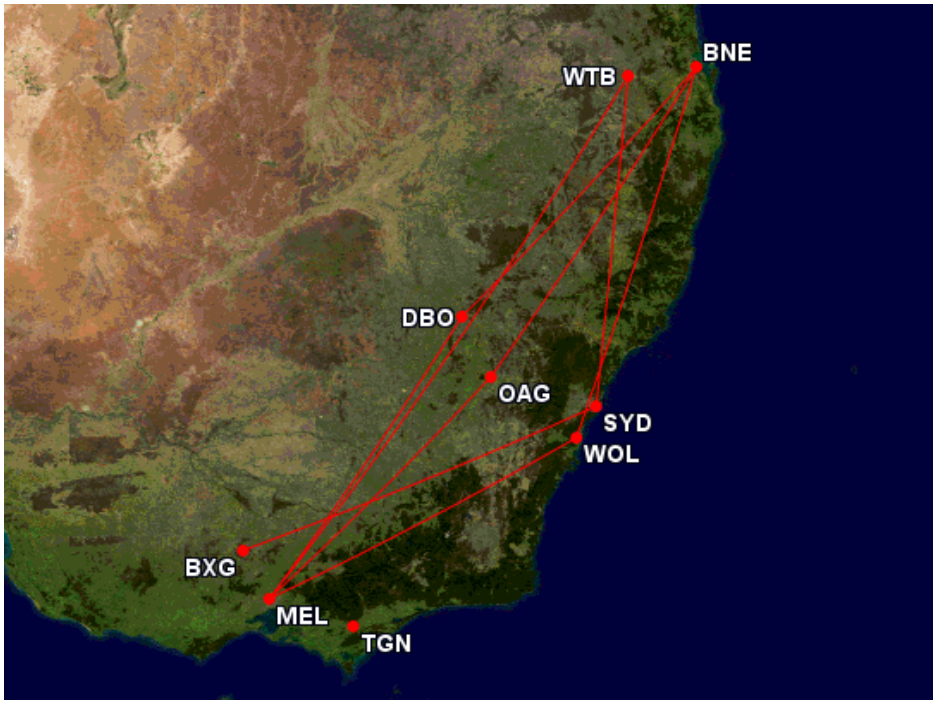
Airports to be consulted were chosen for perceived similarities to Latrobe Regional Airport. The following points were the main drivers in airport choice:

- Interstate RPT services
- Overlapping catchments with the capital city airport
- Not in the sphere of influence of a capital city in an adjoining state
    - This ruled out Albury, Wagga Wagga and airports in Northern NSW
- Airport does not belong to a major leisure destination

The following airports were chosen as part of the consultation process with their interstate route maps shown in **Figure 1**.

- Orange (OAG): OAG-Essendon (MEB), OAG-Brisbane (BNE)
- Dubbo (DBO): DBO-Melbourne (MEL), DBO-BNE
- Shellharbour (WOL): WOL-MEL, WOL-BNE
- Toowoomba Wellcamp (WTB): WTB-MEL. WTB-Sydney (SYD)
- Bendigo (BXG): BXG-SYD

Figure 1: Consulted Airports Interstate Route Map



The following sections detail the findings of each consultation.

7.1 Orange Airport (OAG)

Name	Organisation	Position	Date	Email
Tim Mooney	Orange Airport	Airport Manager	04/09/2020	tmooney@orange.nsw.gov.au

- Destination Demand Drivers
  - Brisbane (BNE): Tourism
  - Essendon (MEB): Business – Mining and medical
- Traffic is 2-way with no significant difference in outbound and inbound
  - Numbers have been steady with no decrease since opening
  - Usually obtaining a 50% load factor or above
  - 22 passengers is the breakeven
- The airlines approached the airport about opening up the routes
  - Airport (council) offers a 3-year tiered tax subsidy scheme (75%,50%,25%)
    - No government subsidy
  - No airport security was required for opening up these routes (will require if they plan to go above 40 passengers on a flight)
  - Qantas (QF) using the Dash 8 Q-200 aircraft
  - Catchment area was considered 100km
- Outreach program
  - Airport pays to advertise the airline throughout the airport and through a new large billboard at the entrance to the airport
    - Through advertising the airline, the airport can capitalise on increased traffic
- Scheduling seen as important in attracting certain markets
  - Timing needs to suit the requirements of travellers
  - Failure of previous Jet Go service can be partly attributed to poor scheduling
- Introduction of Fly Corporate (now Link Airways) service
  - Airline seen as excellent to deal with
  - Airline worked with the chamber of commerce on a business case
  - No freight component incorporated in business case or used on current service

7.2 Dubbo Airport (DBO)

Name	Organisation	Position	Date	Email
Jacki Parish	Dubbo Airport	Airport Manager	07/09/2020	jacki.parish@dubbo.nsw.gov.au

- Drivers of interstate services:
    - 60% business, 28% tourism
    - Occasional medical services and staff
        - Specialists, cancer treatment
- Scheduling and affordability seen as very important
- Failure of the Canberra (CBR) route
    - Failure attributed to poor reliability and scheduling
    - Was quicker to drive to CBR
    - Failed to attract the business market
    - People were not aware of the route (poorly marketed)
- Catchment area
    - Catchment was seen as 4hr driving as opposed to 100km
    - 200,000 people within the catchment
- Opening of a new destination
    - 12-month subsidy to the airline
    - Thereafter the subsidy is based on whether the load factor is less than 50%
- Promotion of new routes
    - Airport offered free flights and accommodation as part of marketing competition
    - This was seen as quite successful
- Qantas operate some freight on their route
    - Not always a component – usually pets (dogs)

7.3 Shellharbour Airport (WOL)

Name	Organisation	Position	Date	Email
Ben Rawson	Shellharbour Airport	Acing Airport Manager	08/09/2020	ben.rawson@shellharbour.nsw.gov.au

- Drivers of interstate services:
    - Mix of business and leisure
    - Not much mining – more local business making up greater than 50% of passengers
    - The weekend trip to MEL and BNE is increasing in demand
- Free parking available at the terminal
    - The airport market the practicality of using WOL as opposed to SYD as you get free long-term parking saving what can be significant amounts of money
- New interstate route:

- Council put out an EOI to attract an airline to open a new route
- Marketing of new route
  - Airport put out a successful radio campaign on the local station
  - Erected billboards close to the highway
- No freight or cargo component

- Airport development plans
  - WOL received a $16m grant (25% funded by council) for the following activities
    - Build a new terminal building
    - Resurface the main runway
    - Commence construction of the aviation business park
- Currently no requirement for security or screening of passengers at airport
  - New terminal building will have this available if required

7.4 Toowoomba Wellcamp Airport (WTB)

Name	Organisation	Position	Date	Email
Robert Kasch	Toowoomba Wellcamp Airport	General Manager	10/09/2020	robert.kasch@wellcampairport.com.au

- Interstate services to SYD and MEL
  - 300,000 people catchment
  - Majority of passengers are business travellers
  - High parking fees at BNE allow WTB to set much lower feed and attract passengers
  - QF operate the Dash 8-Q200 with 2x daily flights to SYD
  - Extra services are offered for major events
  - Mostly outbound traffic
  - There are freight components but they do not dictate the flight and are no seen as a commercial driver (mostly pets and animals)
- State government operates subsidies with the airlines
  - Details of the subsidy not given for commercial reasons
- Qantas flying school based at the airport
  - Opened in January
  - Brings additional passenger traffic
    - Friends, family etc
  - Employ's 100's of people based on airport site
- Qantas operating requirements on services

- Want a 90% load factor at top dollar
- Anything above 80% however seen as acceptable

7.5 Bendigo Airport (BXG)

Name	Organisation	Position	Date	Email
Ben Devanny	Bendigo Airport	Manager Business Services	07/10/2020	b.devanny@bendigo.vic.gov.au

- Qantas' comments on SYD route requirements
  - QF would require a targeted schedule for the business market
  - QF prefer the business market over the leisure market
  - The Dash 8-Q300 would stay overnight
    - Benefit as SYD has capacity issues
- BXG's case for the SYD route
  - Thales (defence contractor) based in Sydney with production centre in Bendigo
  - Bendigo Bank regularly sends staff to Sydney
  - Some FIFO traffic
  - BXG and the council did most of the business case work for Qantas before approaching them
    - Identified Adelaide and Sydney as viable routes
    - Interviewed over 50 local businesses and hundreds of residents
      - Asked questions about how often they travel, where, and how much they would pay
    - Demand showed no subsidy would be required for the route
- Results of opening up the SYD route
  - During school holidays, business trips decrease as leisure becomes more prominent
    - Inbound traffic outweighs the outbound traffic
  - Local professional services using the flight more than expected
  - Local businesses now able to quote in NSW
  - Catchment area much larger than was expected (especially to the south)
  - Airport is doing less marketing than planned as demand is very high
    - Demand on Thursday, Friday and Monday so high that ticket prices go above $400
  - Interest in the airport has surged
    - Pre SYD service, locals weren't aware of the airport
- BXG plan to increase frequency to SYD due to high demand

- Adelaide is considered to be next destination
    - Growth in mining there as well as Bendigo Bank presence
- The new runway cost $15 million to complete
    - Costs were roughly $5 million each between local council, sate gov. and federal gov.
    - Building new runway allowed the airport to operate on existing runway during construction period (opportunity cost).

8. Conclusion

The key success factors identified by the regional airports consulted are equally relevant to the development of RPT services from Latrobe Airport. These were:

- Good airline relationships
- Scheduling that responds to business market
- Reliability of service
- Targeted ticket price
- Low parking prices and ease of access – especially if there is a major city overlap

Any successful business case would also need significant buy in from the local business community as this group would need to be the initial driver for services. Inbound business and tourism (both outbound and inbound) would then build on the base.

The success of developing RPT services from Bendigo was driven by the development of a comprehensive business case as well as major local businesses such as the Bendigo and Adelaide Bank and Thales that provided a base for travel. It is unclear whether this business base exists in the Latrobe Airport catchment area. It was heartening that Bendigo indicated that there was a level of doubt in the local community that dissipated once services were introduced.

It is considered that proposed major infrastructure projects such as Star of the South Wind Farm and the second Bass Strait power link may provide the impetus and base for initial traffic. There would need to be a high level of local commitment from a range of stakeholders to build on this base so that services could be sustained once the projects had been completed.

Several local stakeholders raised the possibility of air freight services to serve the local horticulture, food and seafood industries. The types of aircraft considered to operate RPT services have little belly cargo space so dedicated freighter services may need to be considered. This was outside the scope of this study but does warrant further investigation to determine whether a separate feasible market may exist.