

Air New Zealand

Affordable Pathways Phase 3

Final Report

26 October 2023



Contents

1. Aims and objectives
2. Disclaimer
3. Background
4. Forecast review
5. Airside planning
6. Terminal layouts
7. Landside planning
8. Staging
9. Costing
10. Evaluation
11. Conclusions
12. Next Steps

Appendix A: Consolidated Plan Set

Appendix B: Cost Estimate Details

Executive Summary

Phase 3 of the Affordable Domestic Terminal Pathways project follows on from the Phase 2 work concluded in August 2023.

Phase 2 provided (i) an assessment of AIAL's proposed Integrated Domestic Terminal (IDT) and (ii) consideration of a long list of alternative Domestic Terminal pathway options to provide future capacity.

The scope of Phase 3 was to further refine four shortlisted options to provide more certainty on design (a feasibility or pre-concept level of design) and to enable P50 costing to inform the evaluation and selection of a preferred option.

Evaluation of the shortlisted options shows that the Adjacent Domestic Terminal option is the best scoring option because it provides appropriate capacity and passenger Level of Service whilst improving the transfer connection for Domestic<>International passengers. In terms of the evaluation, it provides similar benefits to AIAL's IDT proposal though with improved operational performance owing to provision of dual Code C taxilanes between a kinked Pier A1 and the current Domestic Terminal Building (DTB). Moreover, it is \$1bn less expensive when directly compared to the reported cost of the IDT.

The other three options do not provide a new processor for Domestic passengers and therefore require a form of passenger transfer between the DTB and remote Pier A1. A bussing operation was found to be a significant operation requiring up to 9 simultaneously-operating buses to serve the 2043 busy hour passenger demands and therefore these options score less well both in terms of operational impact but also in terms of transfer passenger experience.

The Regional Headhouse option scored second best as it provides additional Regional processing capacity and therefore frees up capacity in the DTB for additional Domestic processing. However, this option requires the most landside infrastructure owing to its location away from the DTB and also increases Minimum Connect Times (MCTs) for Regional<>International and Regional<>Domestic transfer passengers. However, the Regional Headhouse option is also the most expensive, with a total option escalated cost of \$2.7bn.

Of the four options, the DTB + Pier A1 option, which provides the least enhancement to the existing terminal, scored the least well as it is unlikely to meet 2043 passenger or baggage-related demand at an appropriate Level of Service.

1. Aims and Objectives

Domestic Terminal - Affordable alternative pathways

Auckland Airport has communicated its intent to replace the existing Domestic Terminal Building (DTB) with a Domestic Jet headhouse and pier (A1) integrated with the existing International Terminal. [REDACTED]

[REDACTED] are aligned with the 2014 Auckland Airport Masterplan [REDACTED]

There are two challenges arising from Auckland Airport's proposed solution, the high cost causing a serious dampening of demand to fly, and the need to extend the life of the DTB to at least 2030 and potentially longer. These challenges create two streams of work that are inter-related:

- Seeking an alternative affordable domestic terminal pathway that challenges the efficacy of the 2014 Masterplan.
- Extending the life of the DTB through operational improvements and capital investment.

Based on a site visit and discussions with Air New Zealand, Arup has developed the following approach to answer these inter-related scope items, including:

1. Assessing the sizing and area provision in the proposed Integrated Domestic Terminal (IDT).
2. Assessing the capacity of the current DTB ecosystem and how all airlines might make best use of the space within and around it at an appropriate level of customer experience and operational performance to at least 2030, and potentially beyond.
3. Developing pathways to provide Domestic Terminal capacity which meet future year requirements to 2043 but which, at a minimum, meet health & safety requirements, are feasible and affordable. These aspects are "non-tradeable". Other elements including customer experience are considered "tradeable" if savings could lead to a feasible and affordable Domestic pathway.

This draft Phase 3 report provides an assessment of four shortlisted Domestic Terminal pathways at Auckland Airport to a feasibility level of design for P50 costing and identifies a preferred option through evaluation.

2. Considerations

Context for reviewing this document

- Arup has undertaken pre-concept planning and design for four options, from landside to airside, including staging, cost estimation and evaluation over a three-month period. We believe these options have been appropriately explored for comparative purposes and with consideration of Air New Zealand's requirements. In comparison, it should be noted that Auckland Airport's 2014 Masterplan and terminal development proposals have been developed and evolved for more than a decade.
- Overnight stand demand requirements have been estimated using current stand requirements grown in line with annual DKMA forecasts. This approach has been validated and confirmed using L&B flight schedule data for 2018 and 2032 and 2019 and 2033 DKMA flight schedule data as provided by AIAL. However, it should be noted that the DKMA flight schedule was redacted, with important data missing (including airline and aircraft type), and therefore assumptions had to be made when using this dataset.
- Airside, terminal and landside arrangements have been developed at a block planning level. This level of detail identifies the spatial implications of the provision of new infrastructure. Accordingly these layouts are appropriate for feasibility and comparative purposes but do not have all the detail of a full design.
- Landside options do not consider the impact on the wider road network. Previous studies indicated that additional northbound and southbound traffic demand through the George Bolt Memorial Drive / Tom Pearce Drive intersection would reduce the level of service of the road network. The introduction of the circular loop road through the existing ITB to the proposed IDT aimed to reduce the traffic demand impacts at the George Bolt Memorial Drive / Tom Pearce Drive intersection.
- Cost estimates have been prepared by WT Partnership to a P50 level of confidence based on the outputs of this study.

3. Background

Summary of previous phase

Phase 3 of the Affordable Domestic Terminal Pathways project follows on from the Phase 2 work concluded in August 2023.

Phase 2 provided (i) an assessment of AIAL's proposed Integrated Domestic Terminal and (ii) consideration of a long list of alternative Domestic Terminal pathway options to provide future capacity.

Several alternatives were identified and scored, based on a range of criteria including terminal, runway, operational impact and affordability. Four options were shortlisted in conjunction with Air New Zealand and comments were sought from the Air New Zealand squads before progressing with Phase 3. Indeed, Air New Zealand's leadership team also carried out its own independent evaluation, which also shortlisted the same options.

The four options shortlisted for further assessment in Phase 3 are as follows:

1. Option 1: Adjacent Domestic Terminal.
2. Option 2: Eastern expansion.
3. Option 3: DTB plus Pier A1.
4. Option 4: Regional Headhouse.

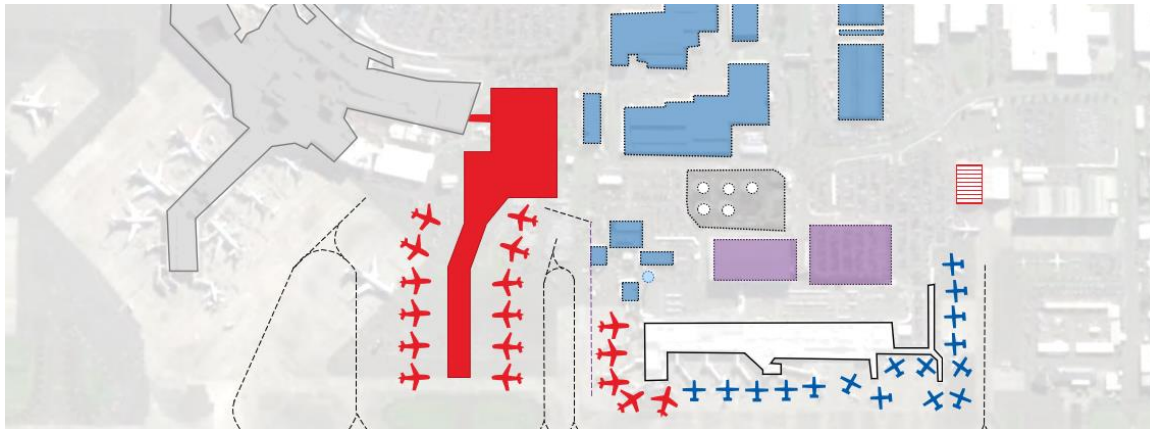
The options listed above have been compared with each other and to AIAL's proposed Integrated Domestic Terminal.

The scope of Phase 3 was to further refine the shortlisted options to provide more certainty on design (a feasibility or pre-concept level of design) and to enable P50 costing in order to inform evaluation and selection of a preferred option.

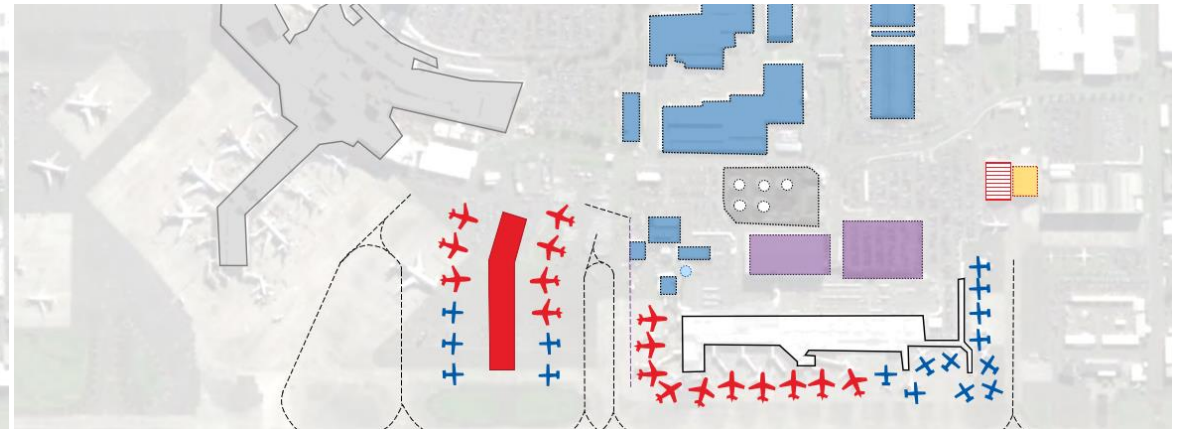
3. Background

Shortlisted options

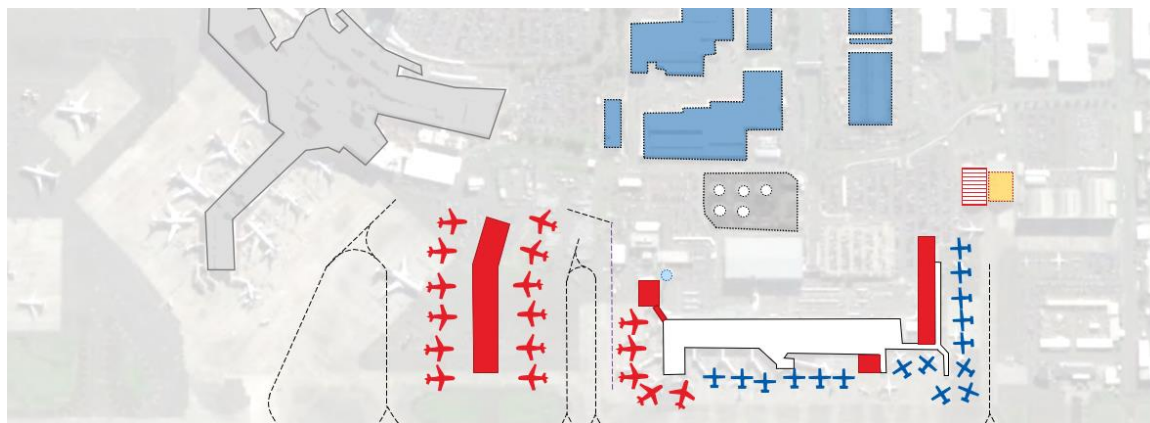
Option 1: Adjacent Domestic Terminal.



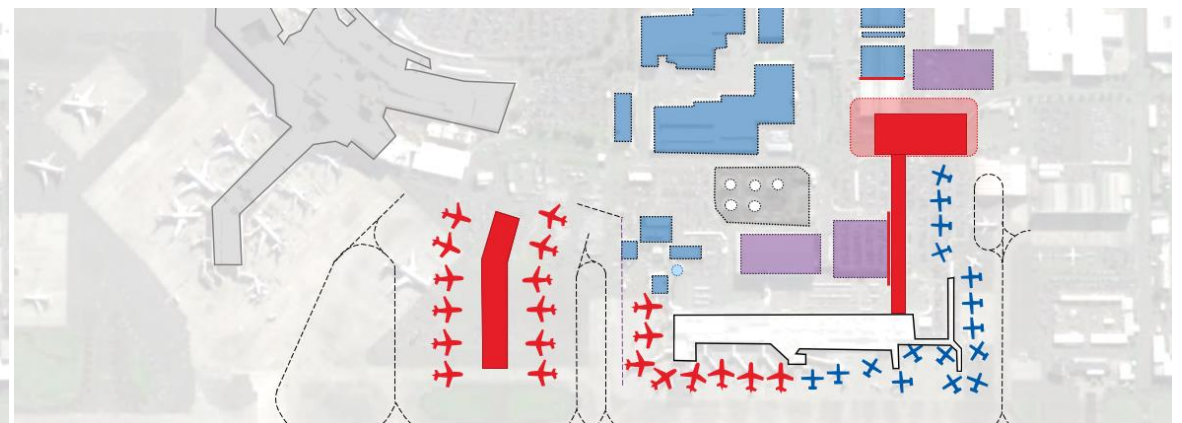
Option 3: DTB plus Pier A1.



Option 2: Eastern expansion.



Option 4: Regional Headhouse.



All options shown are schematics from Phase 2 and layouts have evolved further in Phase 3.

3. Background

Comments from Air New Zealand squads

Feedback on the Phase 2 shortlisted options was received from the Air New Zealand squads on 21 August 2023. The feedback proved helpful in guiding further analysis in Phase 3.

A summary of the feedback received and how it has been incorporated into the Phase 3 work is listed below.

1. Additional information required to understand forecourt operations in the options. *Response: Ground transport options have been developed in Phase 3 and incorporated into the layouts.*
2. Remote pier options will require a different operational approach and may risk late running, increase minimum connect times and increase the need for unit crewing. *Response: Investigation into alternative remote pier access has been undertaken. Operational impacts and Minimum Connect Times have been assessed to quantify the impact that remote bussing may have.*
3. With Domestic operations effectively split between two buildings, concern that every option will likely have a negative impact on Minimum Connecting Time (MCT), especially for domestic-to-domestic transfers. *Response: MCTs by option have been assessed in Phase 3.*
4. Need to understand the DTB baggage make-up unit capacity versus forecast demand and have confidence in a solution. *Response: Independent assessment of baggage make-up and infrastructure undertaken to compare options and inform the evaluation.*
5. GSE charging to be considered. Impact on electrification strategy and ability to hold (park) and service GSE. If charging is not feasible due to space limitations, there will be flow on effects to the GSE planning. *Response: GSE provision and storage considered as part of the airfield planning of shortlisted options.*
6. Affordability ratings don't appear to rate regret spend – arguably this needs to be captured. *Response: Regret spend incorporated into the evaluation.*
7. Peak busy hour forecasts expected to grow at a similar pace as fleet growth. Although we will be adding more flights in the off-peak period as part of Grow Domestic, it would be correct to assume that there will be growth in the busy hour stand requirements. *Response: Assessment undertaken into stand requirements for Domestic and Regional services, across the day and overnight.*

4. Forecast review


Methodology

Reconfirmation of certain aspects of the Phase 2 forecasts was undertaken prior to the further development of the shortlisted options, namely.

- Confirmation of day and overnight aircraft stand requirements through assessment of the AIAL DKMA Design Day Forecast Schedule (DDFS) data for 2019 and 2033.
- Investigation of implementing productivity improvements in the terminal.

Overnight aircraft stand confirmation

Arup's assessment in Phase 2 was based on current stand demand grown in line with the AIAL's DKMA Masterplan forecasts to 2043 and validated against 2018 and 2032 stand demand from Landrum & Brown schedule data produced for Air New Zealand pre-Covid.

However, AIAL also provided DKMA's DDFS data for 2019 and 2033 late in Phase 2 but this had missing, redacted data and was therefore difficult to interpret. Arup revisited these schedules using a combination of historical flight data, Air New Zealand input  and based on arrival and departure airports to partially fill the missing data.

An overnight stand analysis was then undertaken and the peak number of stands needed was compared back to the findings from the Phase 2 outputs.

Productivity improvements

Three productivity improvements were investigated to understand the benefit they could have in extending the life of the DTB.

- Increased percentage of passengers checking in using online and kiosk methods over conventional desk check-in.
- Assuming a decrease in security processing time per passenger from 12 to 10 seconds.
- Assuming a decrease in the re-screening rate from 5% to 2%.

These changes were tested using the Programme of Facility Requirements (PoR) model and the changes in gross and net terminal areas reported.

4. Forecast review

Key findings

Key findings from the updated forecast review are as follows:

- The DKMA DDFS overnight stand assessment showed a similar number of stands were required in 2018/19 and 2032/33 when compared to the Phase 2 approach for generating stand requirements, albeit with one additional Domestic jet stand required in 2033 (15 as compared to 14) when considering the DKMA forecast.
- Accordingly the Phase 2 approach of growing the number of aircraft stands required into the future was considered reasonable and proportionate.
- As part of the evolution of the layouts, all options now also include an additional 15th Domestic jet stand in 2033 to provide appropriate resilience.

4. Forecast review

Overnight stand requirements

Demand for all airlines flying Domestic Jet and Regional turboprop routes is included in the DKMA Traffic Forecast Study and in the adjacent table.

A limitation of the DKMA data is that Domestic Jet and Regional demand is combined into one forecast number and does not provide any information on daytime or overnight stand requirements to 2043.

Accordingly an assessment of the following design day flight schedules was undertaken to validate the daytime and overnight stand requirements for Domestic and Air New Zealand Regional services.

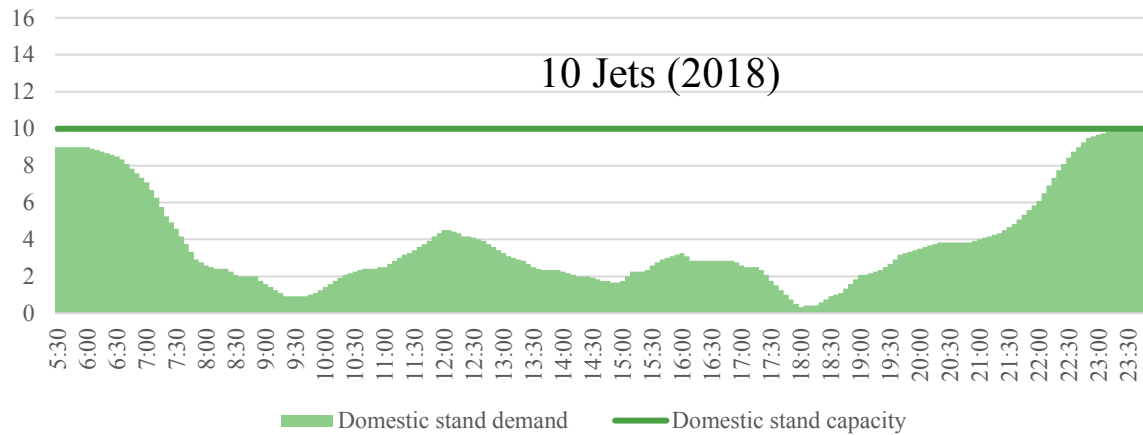
- Landrum & Brown DDFS for 2018 and 2032, produced for Air New Zealand in 2018.
- DKMA’s DDFS data for 2019 and 2033 as developed for AIAL and revised in 2023.

Busy Day Flight Schedule - Key Figures					
	Total for Domestic Jet and Regional				
	FY2019	FY2028	FY2033	FY2038	FY2043
Annual Passengers excl. Transit (000)	9594	11481	12874	14211	15623
Annual growth		2.0%	2.3%	2.0%	1.9%
Busy Day Passengers (incl. Transit)	31020	36929	40960	44753	48785
Annual Growth		2.0%	2.1%	1.8%	1.7%
Share of Annual	0.3%	0.3%	0.3%	0.3%	0.3%
Ratio over busy day	1.18	1.174	1.161	1.149	1.14
Busy Day Seats	35028	41541	46014	50070	54442
Annual Growth		1.9%	2.1%	1.7%	1.7%
Average Seat per Movement	102.1	117.3	120.5	123.3	126
Annual Growth		1.6%	0.5%	0.5%	0.4%
Load Factor	88.6%	88.9%	89.0%	89.4%	89.6%
Peak Hour Passengers (excl. Transit)					
Arrivals	1363	1679	1879	1977	2107
Annual Growth		2.3%	2.3%	1.0%	1.3%
Share of Busy Day	9.0%	9.3%	9.3%	8.9%	8.8%
Departures	1355	1625	1736	1893	2113
Annual Growth		2.0%	1.3%	1.7%	2.2%
Share of Busy Day	8.5%	8.6%	8.4%	8.4%	8.5%
Busy Day ATMs (Comm. Pax Acft)	343	354	382	406	432
Annual Growth		0.4%	1.5%	1.2%	1.2%
Peak Hour ATMs					
Arrivals	15	16	17	17	18
Share of Busy Day	8.8%	9.1%	8.9%	8.4%	8.4%
Departures	16	17	19	20	21
Share of Busy Day	8.3%	8.6%	9.0%	9.3%	9.3%

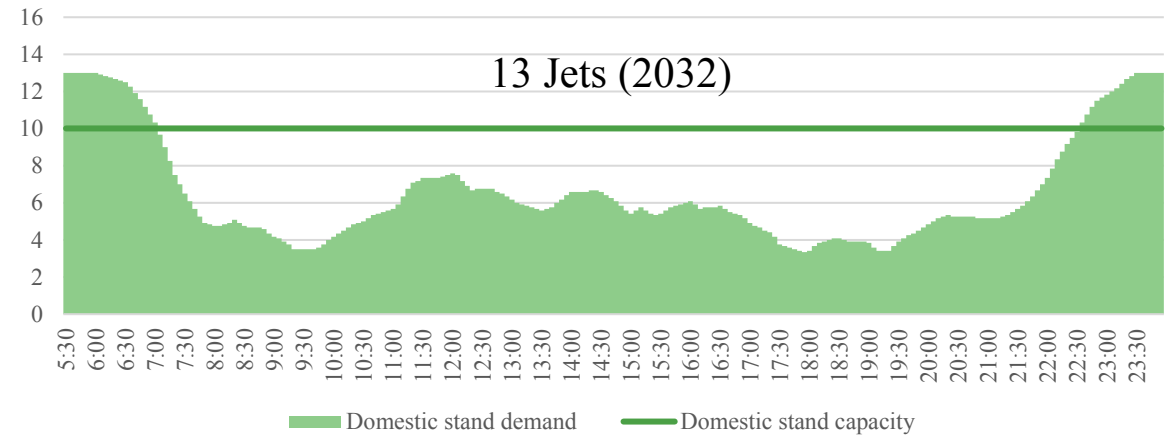
4. Forecast review

Overnight stand requirements: L&B DDFS assessment (2018 study)

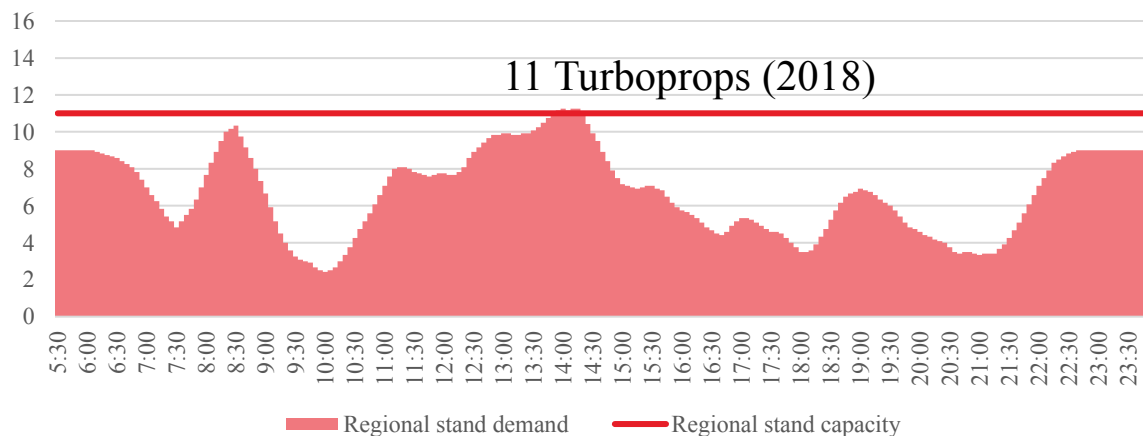
Auckland Domestic Jet stand capacity assessment, FY2018



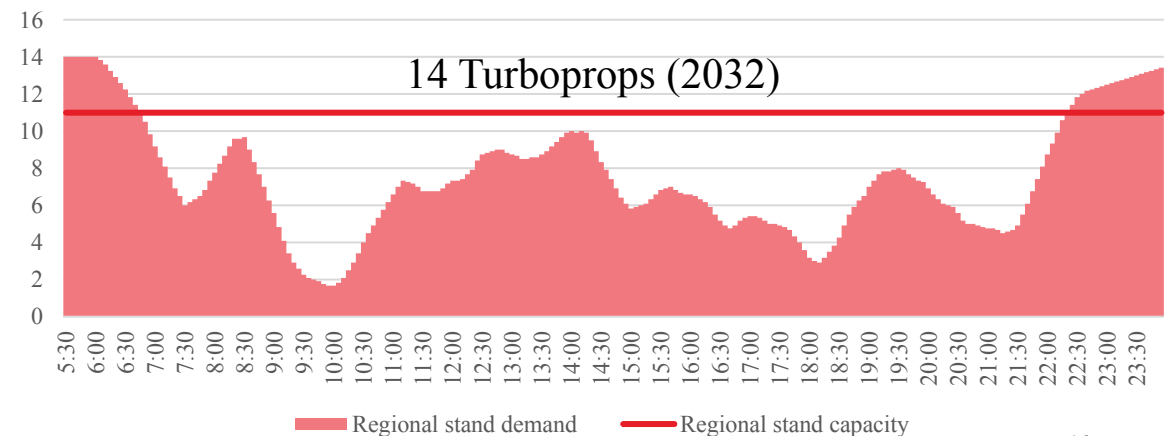
Auckland Domestic Jet stand capacity assessment, FY2032



Auckland Regional stand capacity assessment, FY2018



Auckland Regional stand capacity assessment, FY2032



4. Forecast review

Overnight stand requirements: Growth in line with DKMA forecasts

2018 overnight stand requirement from the L&B data matches current provision and was therefore used as base from which to grow requirements.

Future stand requirements have been grown in line with AIAL’s DKMA forecast.

Comparison with 2032 L&B DDFS stand requirements with 2033 output indicates appropriateness of this growth method i.e. L&B requirement for 14 Domestic jet and 13 Regional turbo-prop stands (see previous slide) as compared to 14 Domestic jet and 14 Regional turbo-prop stands in the methodology below.

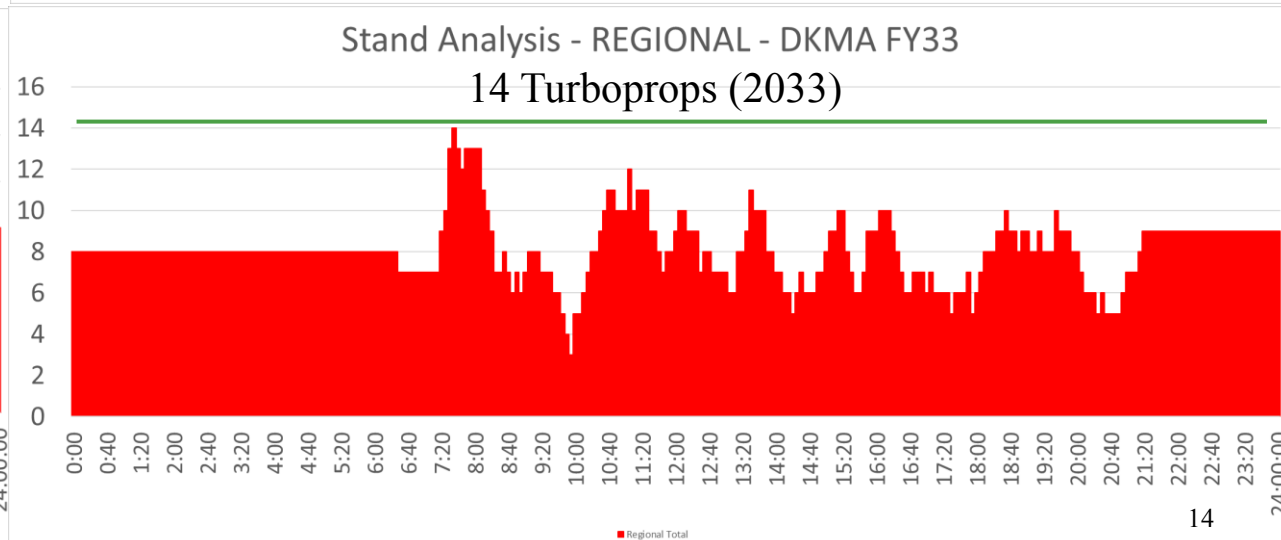
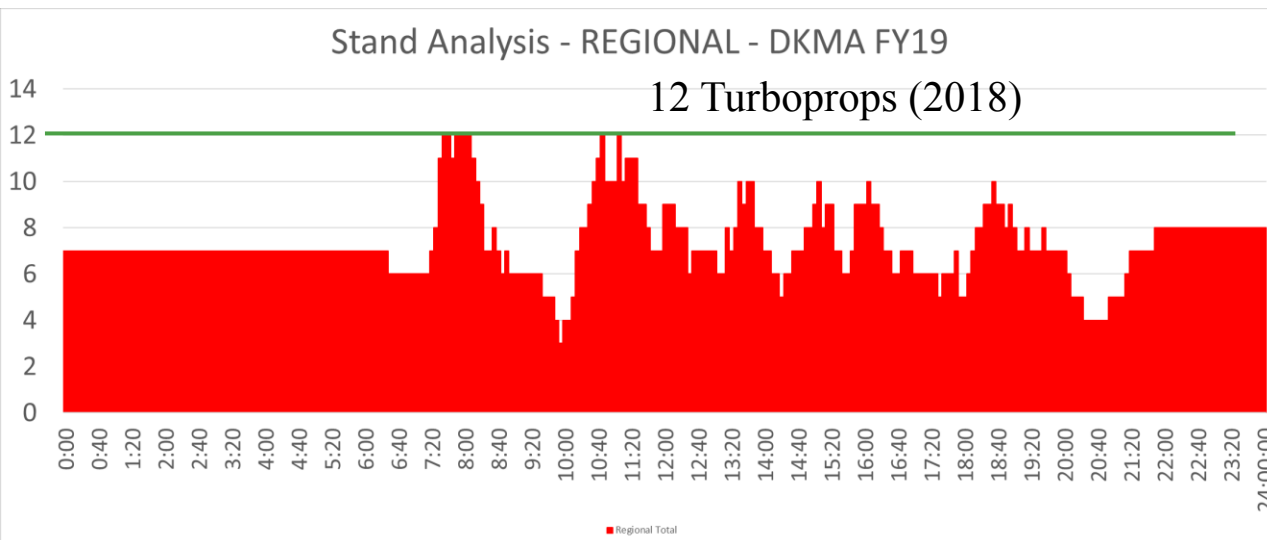
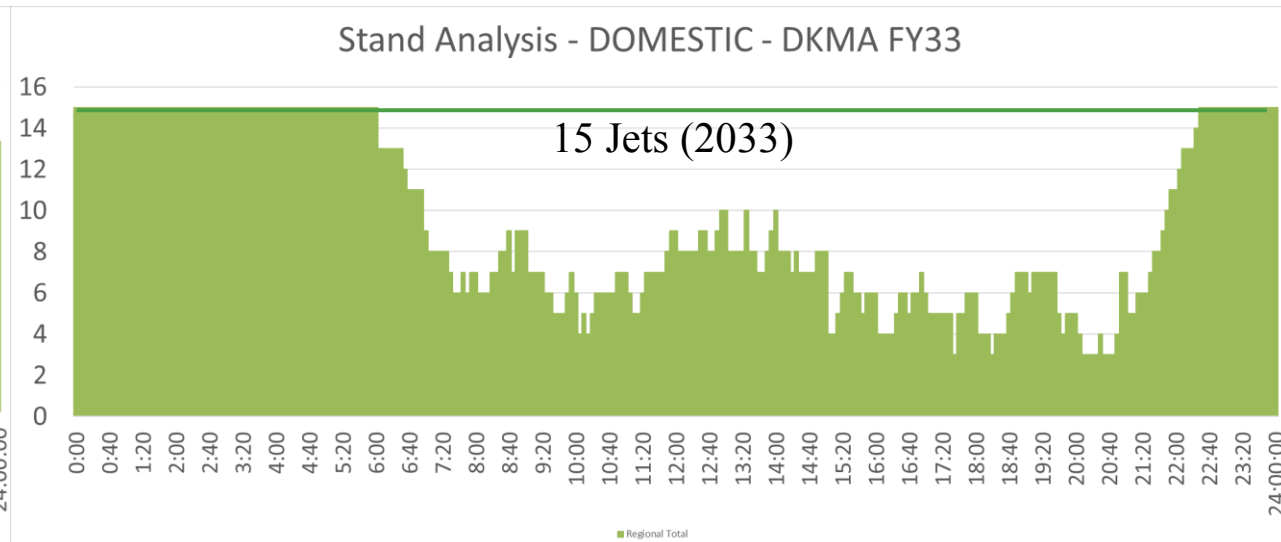
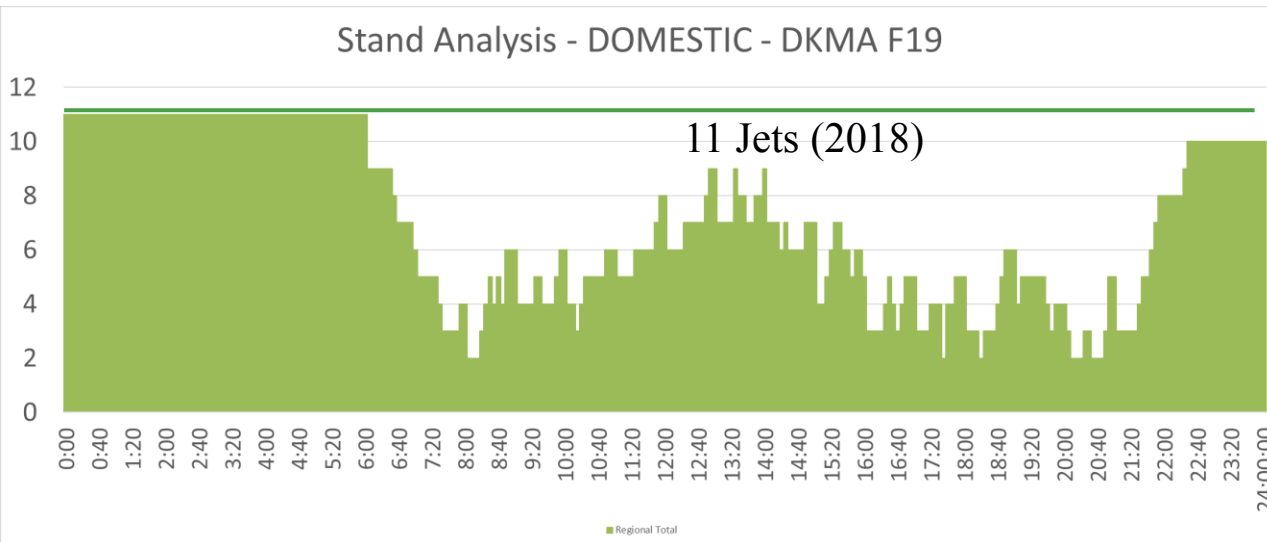


© Google Earth, accessed 12/05/2023

	FY 2019	FY 2028	FY 2033	FY2038	FY 2043	FY 2048
	Current Provision / 2018 L&B	Grown annually in line with pax demand				
Domestic Pax (mppa)	6.771	8.239	9.294	10.321	11.414	13.046
Regional Pax (mppa)	2.823	3.242	3.580	3.890	4.209	4.548
Domestic Jet Stands	10	12	14	15	17	19
Regional Turboprop Stands	11	13	14	15	16	18
Total Stands	21	25	28	30	33	37

4. Forecast review

Overnight stand requirements: Validation against DKMA DDFS



4. Forecast review

Overnight stand requirements: Validation against DKMA DDFS

A comparison of the outcomes from the assessment against the DKMA DDFS shows that the stand requirements developed in Phase 2 are reasonable and proportionate. There is up to one stand difference between the forecasts. As the DKMA DDFS contained missing cells and redacted information, it was agreed to continue with the Phase 2 dataset and stand numbers for the purposes of Phase 3 planning. However, all options now also include an additional 15th Domestic jet stand in 2033 anyway as part of evolving the layouts.

Stands	FY2019 <i>From schedule</i>	FY2028	FY2033 <i>From schedule</i>	FY2038	FY2043	FY2048
Domestic	11 (+1)	-	15 (+1)	-	-	-
Regional	12 (+1)	-	14 (-)	-	-	-
Total stands	23 (+2)	-	29 (+1)	-	-	-

	FY2019 <i>Current provision</i>	FY2028 <i>Grown Annually</i>	FY2033 <i>Grown Annually</i>	FY2038 <i>Grown Annually</i>	FY2043 <i>Grown Annually</i>	FY2048 <i>Grown Annually</i>
Domestic mppa	6771000	8239000	9294000	10321000	11414000	13046000
Regional mppa	2823000	3242000	3580000	3890000	4209000	4548000
Domestic	10	12	14	15	17	19
Regional	11	13	14	15	16	18
Total stands	21	25	28	30	33	37

5. Airside planning

Methodology

The findings of the forecast review and outcomes of Phase 2 define the refinements to airside planning for the four shortlisted options.

The forecast review concluded the following stands were required to be provided by the forecast years.

Stands	FY2033	FY2043
Domestic (Jet)	14 to 15	17
Regional (T/prop)	14	16
Total stands	28	34

The following key considerations underpin the airside planning for the four shortlisted options:

- Provision of dual Code C taxilanes to the west of the DTB and the Adjacent Domestic Terminal / remote pier and to the east of the DTB for regional turboprop access.
- The need to futureproof for the contingent runway and realignment of Taxiway Bravo.
- Passenger transfer access to the remote pier.

Taxiway Bravo impact

Discussions at Workshop 1 on 13 September 2023 concluded that realignment of Taxilane Bravo for the Contingent Runway would likely be a permanent change. The airside options for 2033 and 2043 have accordingly been refined to include for this realignment.

GSE charging

The need to consider GSE charging was outlined in the Air New Zealand squad feedback. Short- and long-term storage and charging options have been considered and are shown for the shortlisted options.

Passenger transfer to remote pier

At Workshop 1, a number of different passenger transfer options were presented to Air New Zealand between the DTB and the remote pier, ranging from pedestrian connections (tunnel or bridge), bus transfer or people-mover system.

Given Air New Zealand squad feedback, bus transfer was investigated in detail to understand the operational requirements including number of buses and service frequency as well as spatial requirements for bus routing and location of passenger transfer lounges. A series of routes through the airfield were investigated to compare the operational impact on passenger transfer to the remote pier.

5. Airside planning

Key findings

Findings from the airside planning of the four shortlisted options shows that:

- All four shortlisted options can accommodate the required number of Domestic and Regional stands alongside two dual Code C taxiways on the eastern and western sides of the DTB.
- All four shortlisted options can be configured to futureproof for a permanently re-aligned Taxiway Bravo as a result of introduction of the Contingent Runway. This has meant that passenger boarding bridges on the southern edge of the DTB need to be removed and apron access roads be re-provided as a tail-of-stand road.
- Additional Code C jets and turboprops can be accommodated on the eastern and western ends of the DTB through pier expansions e.g. each option allows for a 15th jet stand in 2033 which provides resilience.
- Vehicle Service Roads (VSR) to be moved further north in all shortlisted options.
- Locations for short- and long-term storage and charging were identified, with short term charging possibly integrated at stands with PBBs.

In terms of passenger transfer to a remote Pier A1 in the Eastern expansion, DTB plus Pier A1 and Regional Headhouse options:

- A pedestrian link between the DTB and remote Pier A1 as well as people-mover option, either tunnel or bridged, were considered to require significant capital investment and to also lock in a solution that retains the DTB in perpetuity (which is not preferred).
- Bussing was therefore considered to be the most realistic option for passenger transfer in this context but noting this type of operation for up to 12 Code C jets entails significant operational complexity and risk.
- Passenger transfer bussing will be a significant operation requiring 7-9 simultaneously-operating buses to serve the 2043 busy hours.
- The complexity and risk of this type of bussing operation is reflected in the evaluation of options (see Section 10).

5. Airside planning

Adjacent Domestic Terminal - Apron layouts with impact of Taxiway Bravo realignment

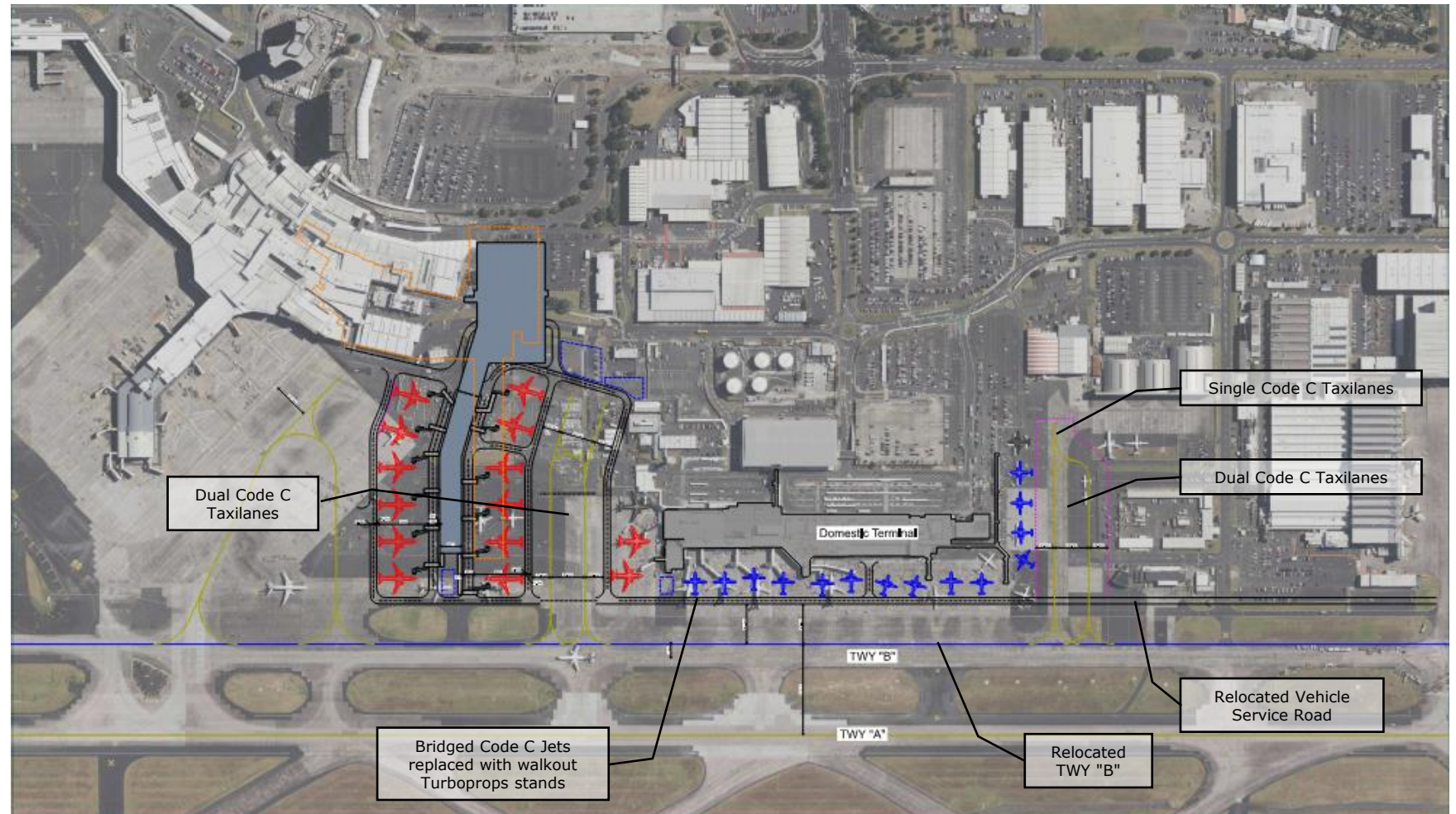
2033

14 Code C Jets

14 Turboprops

Notes

- Relocated TWY Bravo and Vehicle Service Road (VSR) to be relocated north as well (~14m north)
- 12 x Code C contact stands on Adjacent Terminal and Pier A1
- 14 x turboprop aircraft parking to the south and east of the DTB
- Maintaining existing stands on north-west and north-east of DTB provides for a 15th jet and turboprop stand if demand requires this



5. Airside planning

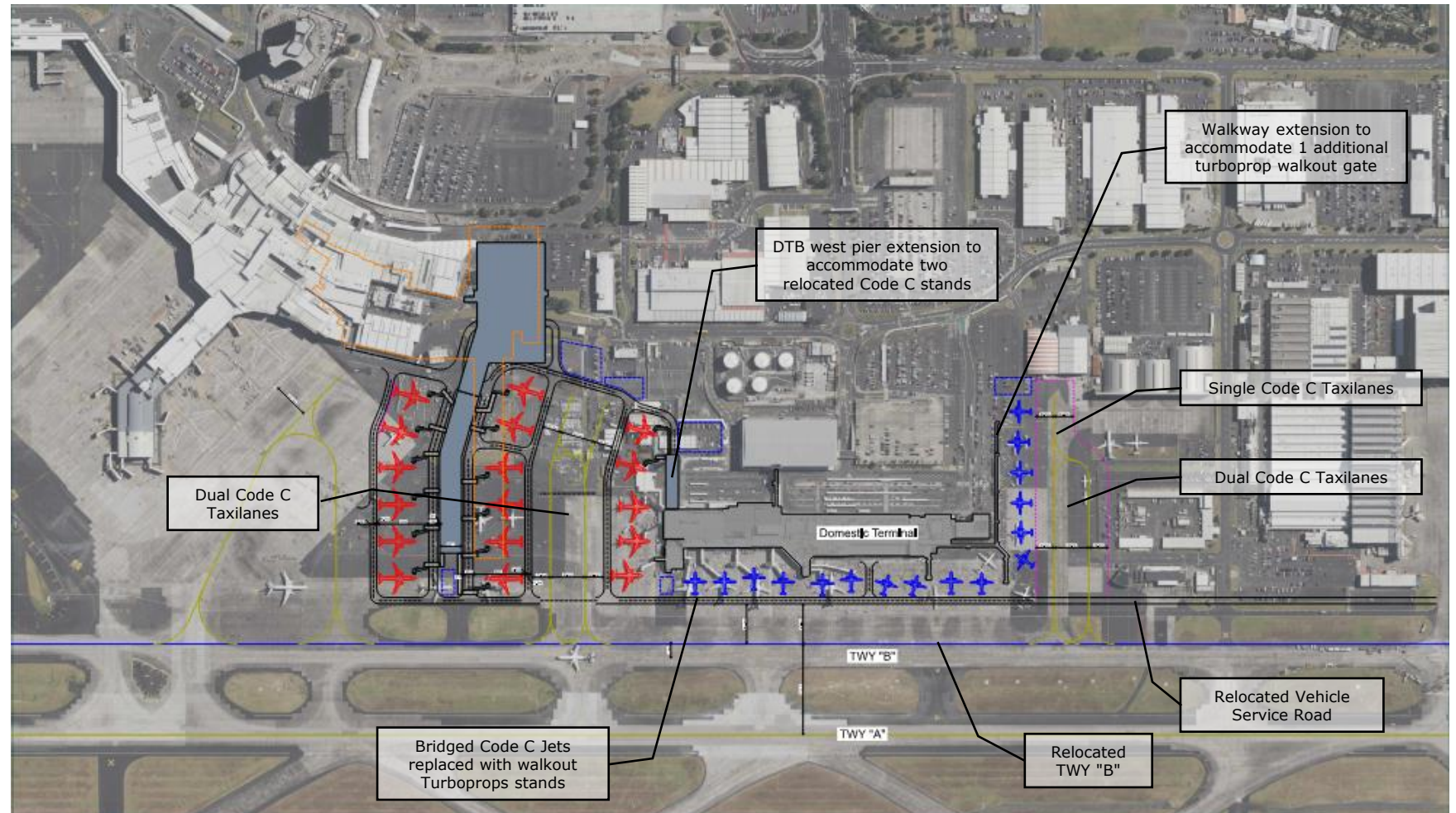
Adjacent Domestic Terminal - Apron layouts with impact of Taxiway Bravo realignment

2043

17 Code C Jets

16 Turboprops

- Relocated TWY Bravo and Vehicle Service Road (VSR) to be relocated north as well (~14m north)
- 12 x Code C contact stands on Adjacent Terminal and Pier A1
- 2 x additional Code C contact stands provided on north-west of the DTB, 5 in total.
- 16 x turboprop aircraft parking to the south and east of the DTB



5. Airside planning

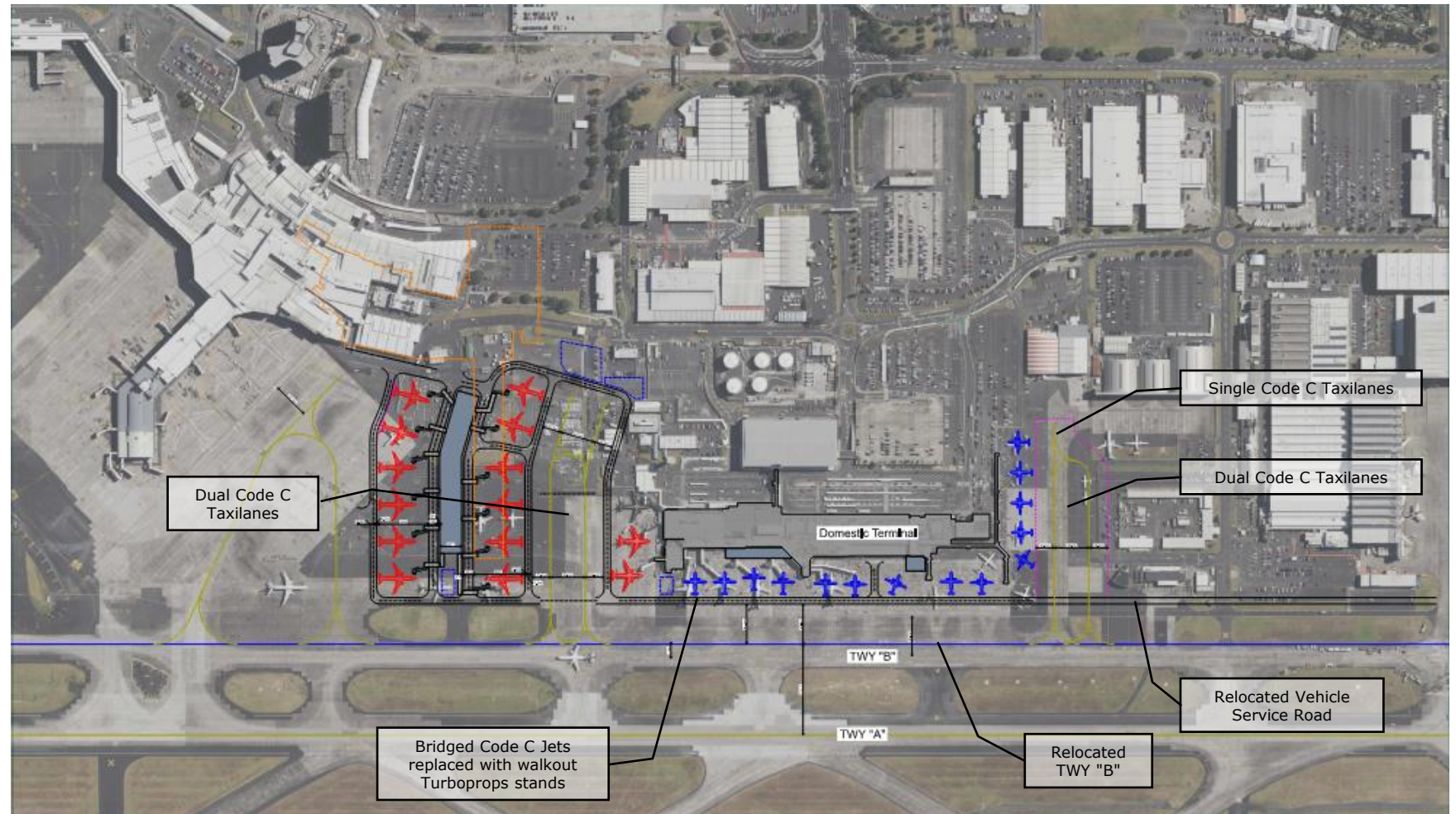
Eastern expansion - Apron layouts with impact of Taxiway Bravo realignment

2033

14 Code C Jets

14 Turboprops

- Relocated TWY Bravo and Vehicle Service Road (VSR) to be relocated north as well (~14m north)
- 12 x Code C remote stands on Pier A1
- 14 x turboprop aircraft parking to the south and east of the DTB
- Maintaining existing stand on north-west of DTB provides for a 15th jet stand if demand requires this



5. Airside planning

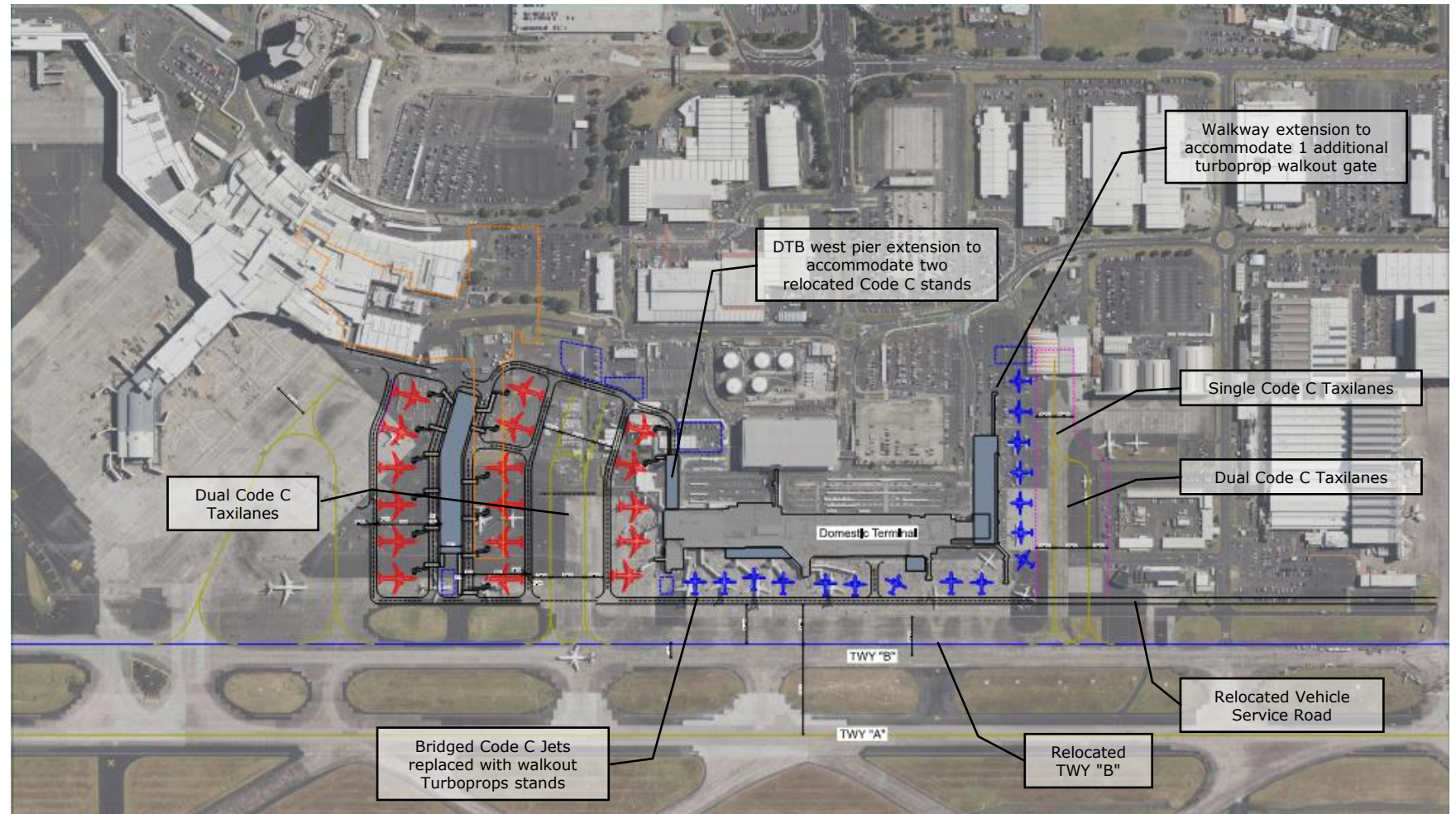
Eastern expansion - Apron layouts with impact of Taxiway Bravo realignment

2043

17 Code C Jets

16 Turboprops

- Relocated TWY Bravo and Vehicle Service Road (VSR) to be relocated north as well (~14m north)
- 12 x Code C remote stands on Pier A1
- 2 x additional Code C contact stands provided on north-west of the DTB, 5 in total
- 16 x turboprop aircraft parking to the south, east and north-east of the DTB



5. Airside planning

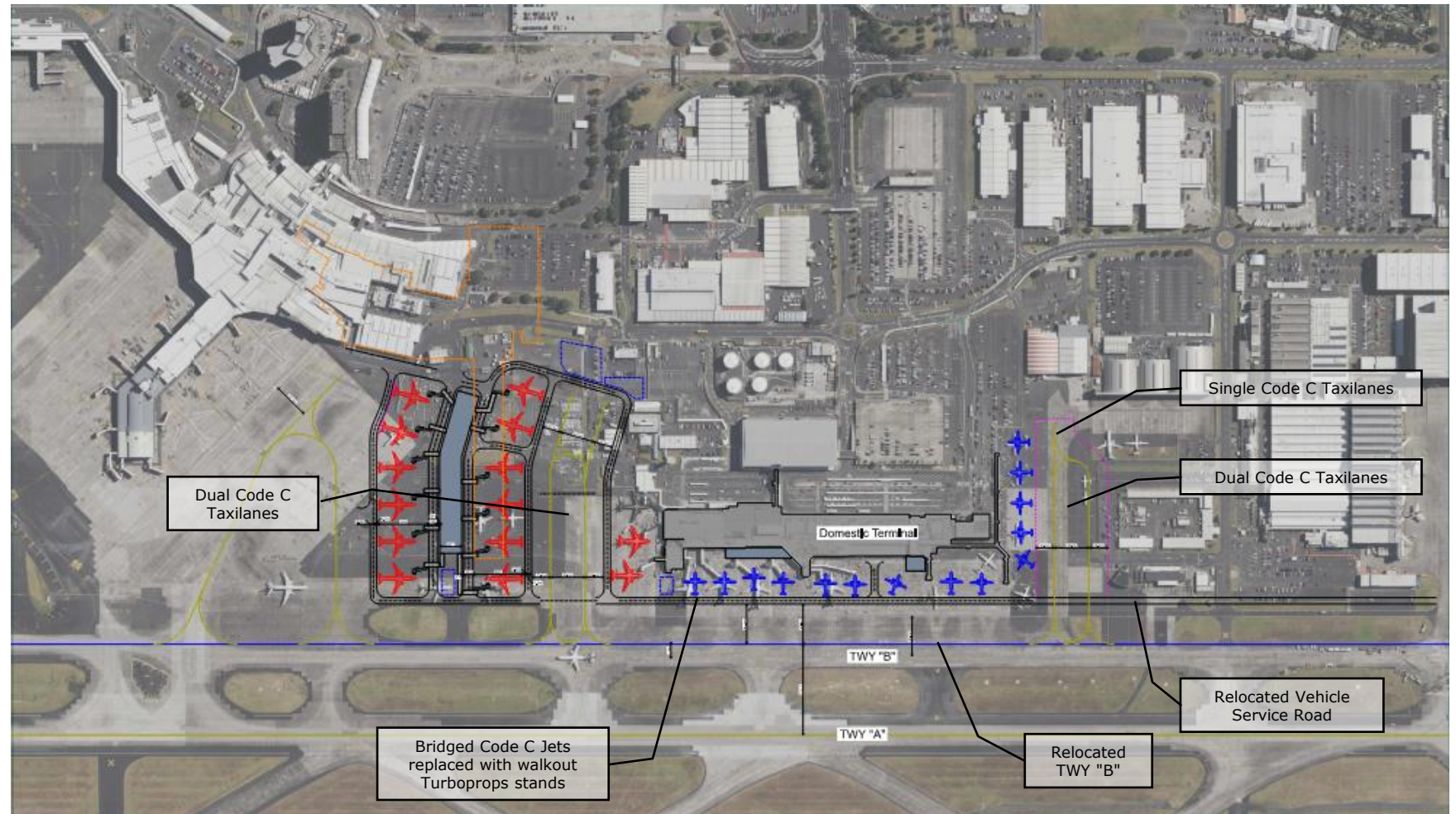
DTB + Pier A1 - Apron layouts with impact of Taxiway Bravo realignment

2033

14 Code C Jets

14 Turboprops

- Relocated TWY Bravo and Vehicle Service Road (VSR) to be relocated north as well (~14m north)
- 12 x Code C remote stands on Pier A1
- 14 x turboprop aircraft parking to the south and east of the DTB
- Maintaining existing stand on north-west of DTB provides for a 15th jet stand if demand requires this



5. Airside planning

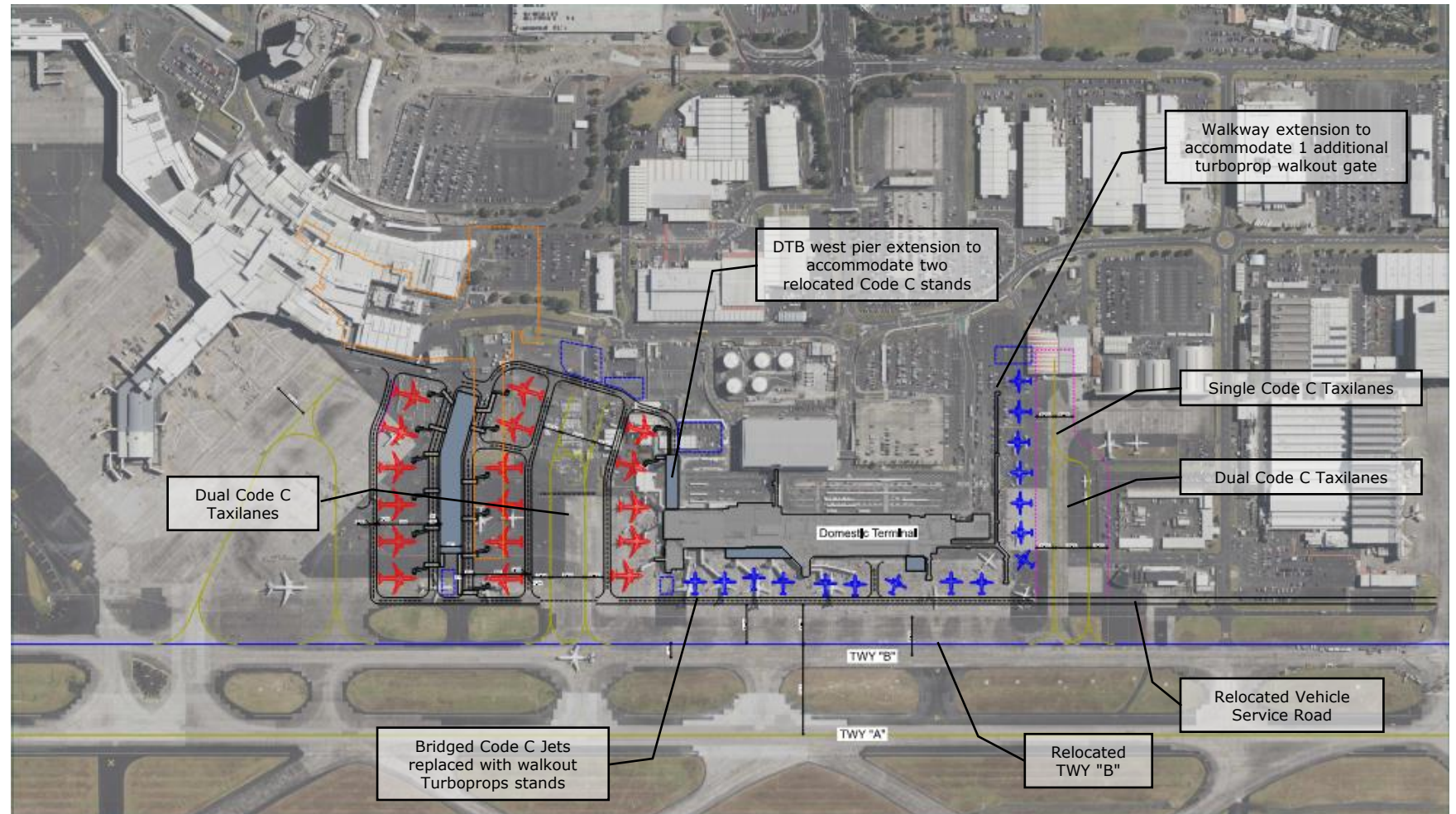
DTB + Pier A1 - Apron layouts with impact of Taxiway Bravo realignment

2043

17 Code C Jets

16 Turboprops

- Relocated TWY Bravo and Vehicle Service Road (VSR) to be relocated north as well (~14m north)
- 12 x Code C remote stands on Pier A1
- 2 x additional Code C contact stands provided on north-west of the DTB, 5 in total
- 16 x turboprop aircraft parking to the south, east and north-east of the DTB



5. Airside planning

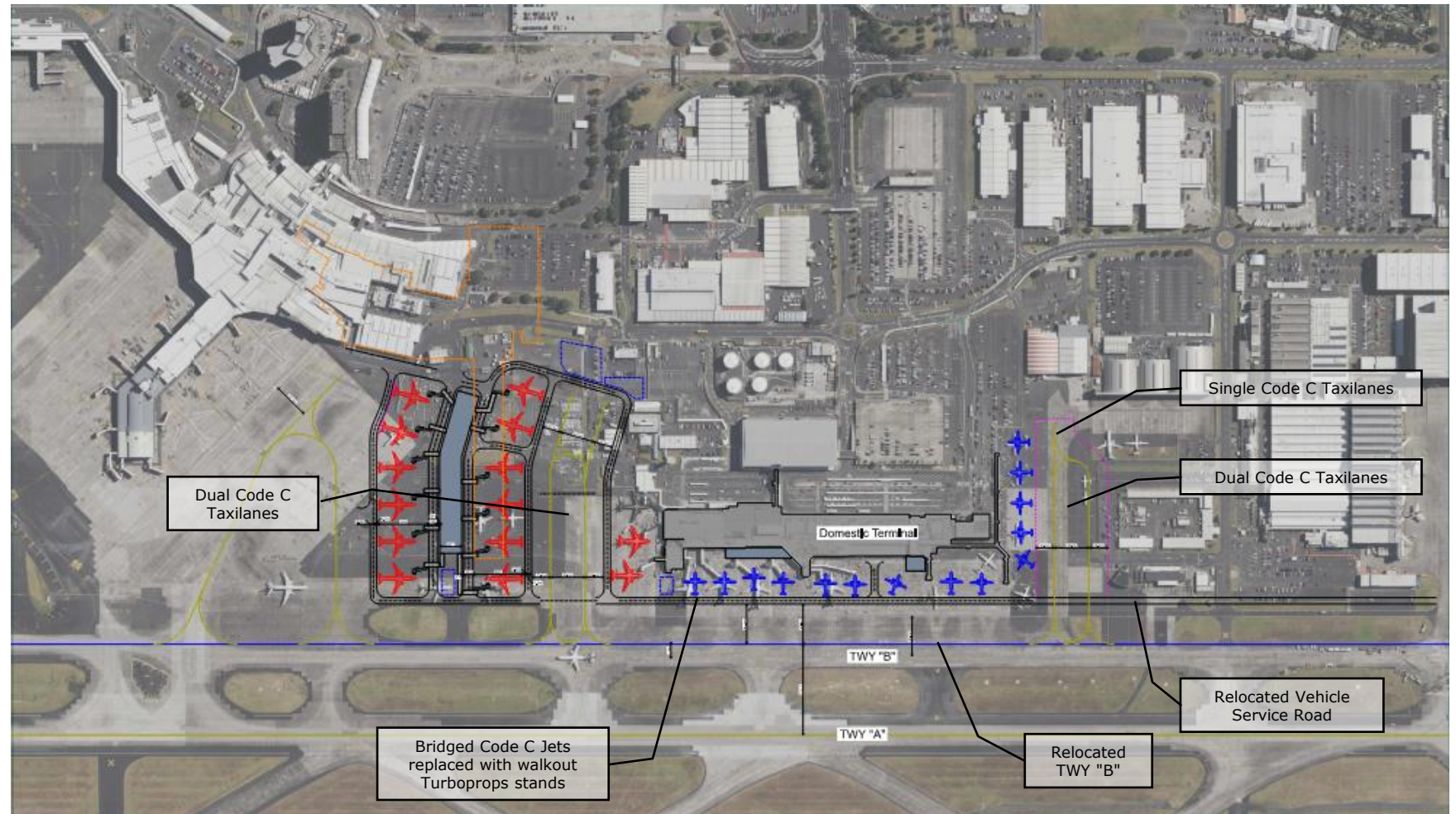
Regional Headhouse - Apron layouts with impact of Taxiway Bravo realignment

2033

14 Code C Jets

14 Turboprops

- Relocated TWY Bravo and Vehicle Service Road (VSR) to be relocated north as well (~14m north)
- 12 x Code C remote stands on Pier A1
- 14 x turboprop aircraft parking to the south and east of the DTB
- Maintaining existing stand on north-west of DTB provides for a 15th jet stand if demand requires this



5. Airside planning

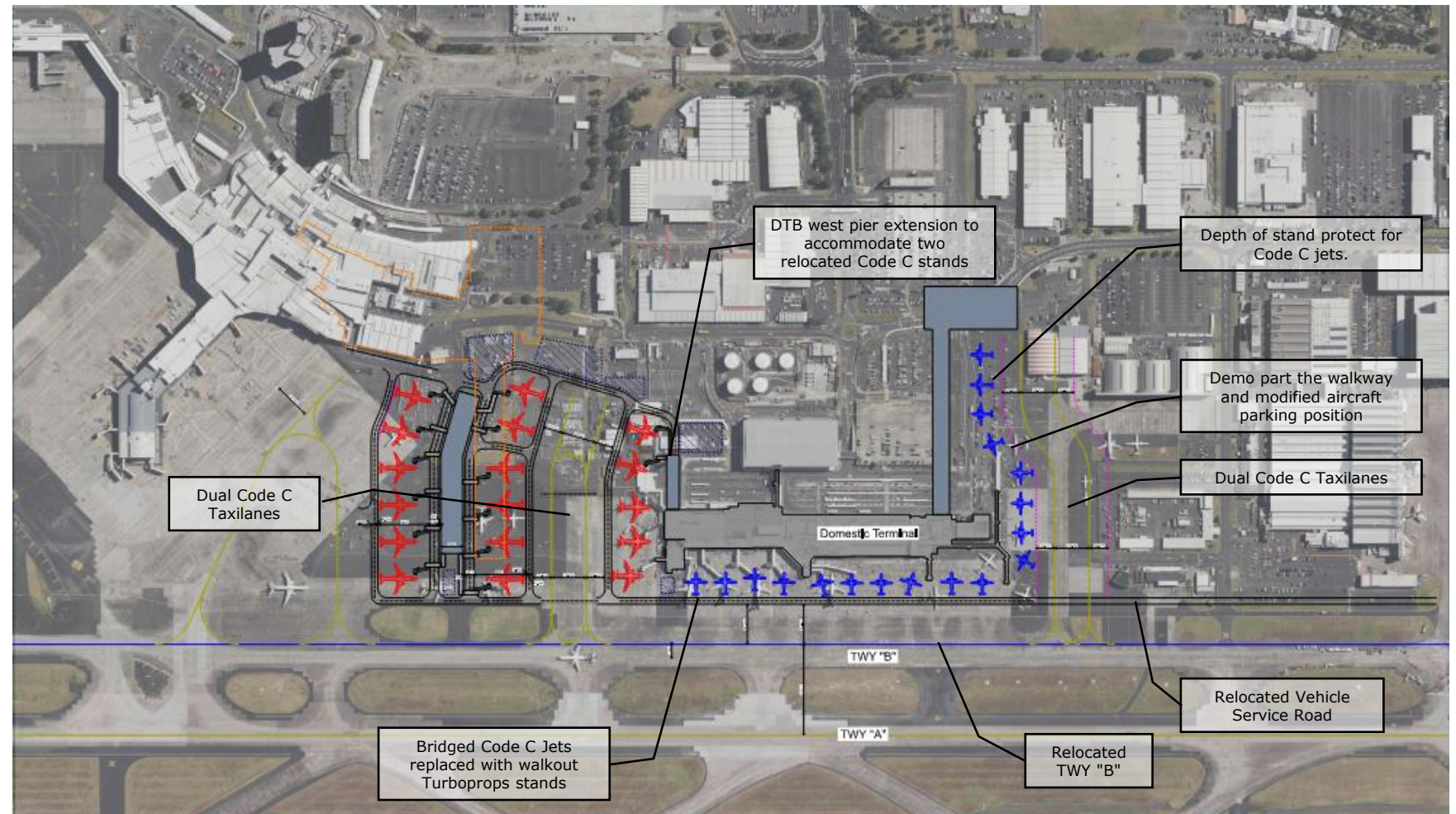
Regional Headhouse - Apron layouts with impact of Taxiway Bravo realignment

2043

17 Code C Jets

18 Turboprops

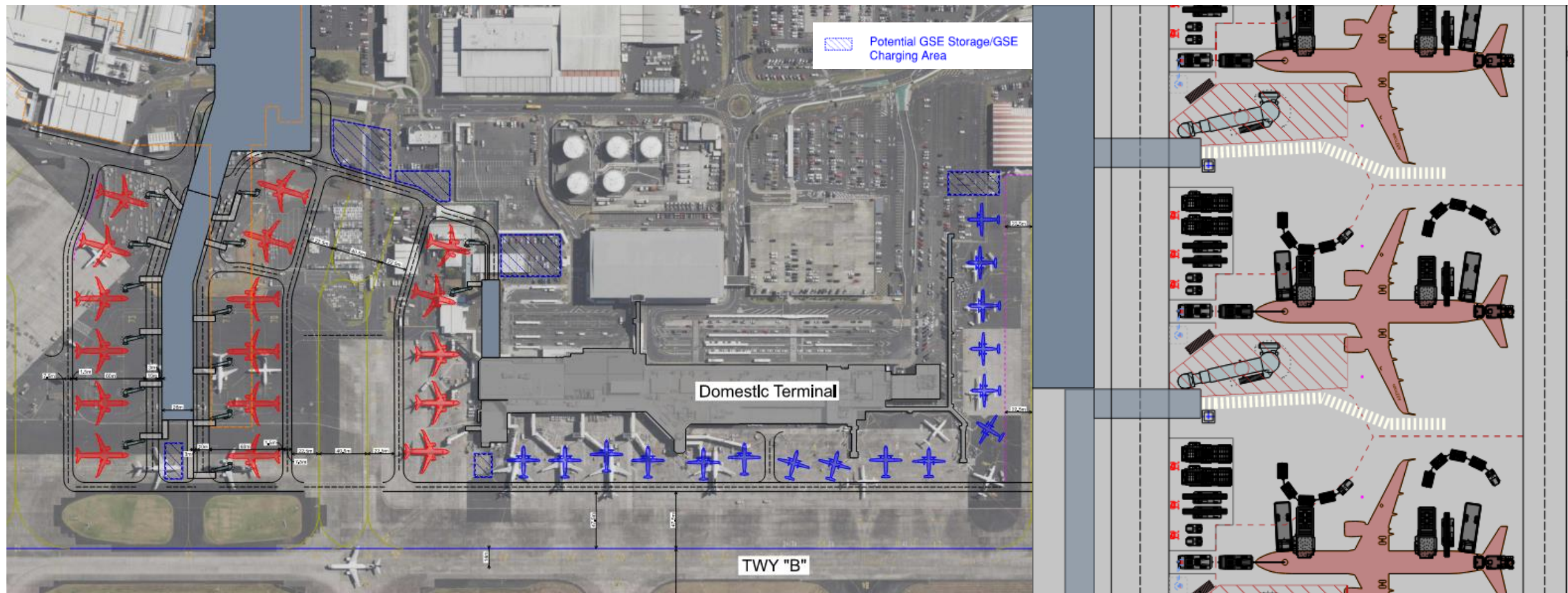
- Relocated TWY Bravo and Vehicle Service Road (VSR) to be relocated north as well (~14m north)
- 12 x Code C remote stands on Pier A1
- 2 x additional Code C contact stands provided on north-west of the DTB, 5 in total
- 18 x turboprop aircraft parking to the south, east and north-east of the DTB, 2 more than required
- Depth of stands futureproof for Code C jets on the eastern side.



5. Airside planning

GSE storage and charging

Potential location for GSE storage (with charging) and short term charging at the stands.



5. Airside planning

Passenger transfer operation

Options with the remote pier require passenger transfer between the DTB and the remote pier. There is an approximately 230m distance between the two buildings.

The following options were considered to provide this transfer:

- Underground pedestrian walkway e.g. Heathrow T2 to T2B with a 300m walk length including travelators.
- Pedestrian bridge spanning the taxiway e.g. Gatwick Airport, spanning 260m and delivered for a cost of ~\$400m NZD (2023 value).
- Automated people mover could be considered, however, would need to be alongside a tunnel or bridge structure as per above.

At Workshop 1 on 13 September 2023, all the above options were considered to require significant capital investment and to lock in a solution that retains the DTB in perpetuity (which is not preferred). Therefore, bussing was considered to be the most realistic option for passenger transfer in this context but noting this type of operation for up to 12 Code C jets entails significant operational complexity and risk.



5. Airside planning

Passenger transfer operation: Bussing

The goal of this assessment was to determine the frequency and number of buses for transferring passengers to/from the remote terminal building, and associated space requirements.

Key assumptions:

- Domestic and regional 2043 pax split by stand allocations.
- Using a 'peak within peak' – 30% of peak-hour passengers in 15min.
- Standard Auckland Airport buses (63 pax, 1 door).
- Boarding passes are scanned before passengers can transfer to the remote building.
- Gate lounge sizing based on IATA guidelines for a demand of 30min of busy hour passengers.
- Delays due to aircraft pushing back are assumed.

Services, frequency and buses

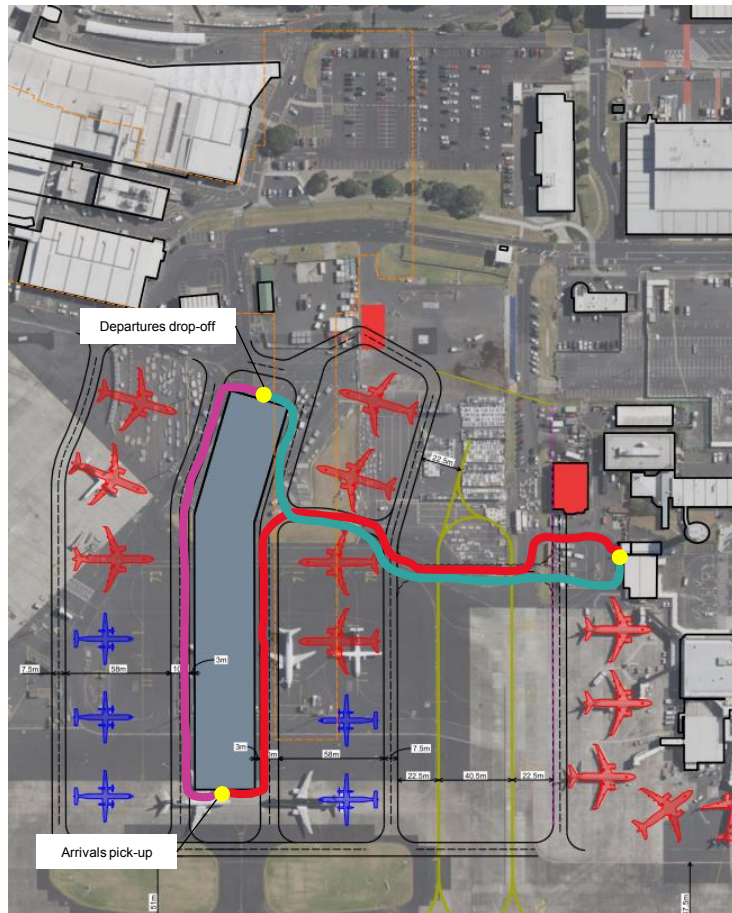
1. Number of services is based on the 2043 busy hour (30% of demand in 15 minutes)
2. Trip durations are based on the distances travelled by the buses, with rough estimates for potential delays factored into calculations
3. Number of buses is found as a combination of the above.

Supporting infrastructure

1. Podiums are sized to avoid bottlenecks upstream of the bus doors
2. Waiting area size is based on IATA guidelines for a demand for 30min of busy hour departures
3. Queue size is based on a 5min queue.

5. Airside planning

Passenger transfer operation: Bussing



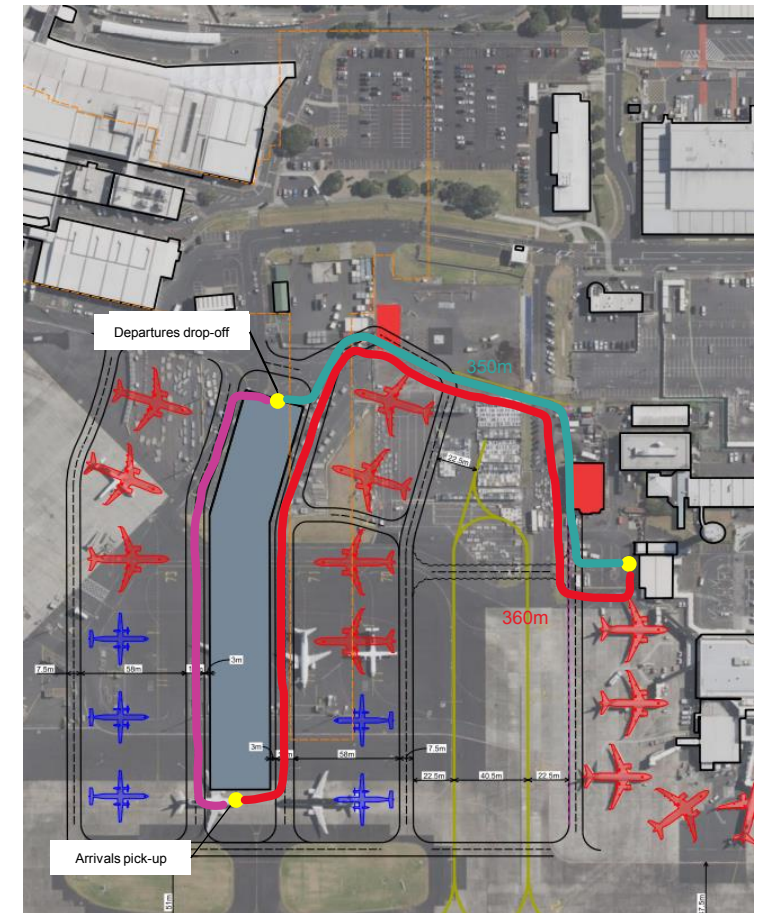
Route A

More passenger-bus interaction.
Assumed delay: 2+ mins



Route B

More impacted by aircraft pushbacks.
Assumed delay: 5+ mins



Route C

Lowest interaction on apron.
Assumed delay: 2 min

5. Airside planning

Passenger transfer operation: Bussing

Outcomes:

- The bussing to remote Pier A1 will be a significant operation requiring 7-9 simultaneously-operating buses to serve the 2043 busy hour.
- Route C is least susceptible to delays from aircraft pushbacks and is proposed as the most appropriate operation.

Metric	Route A <i>Separate bus gates at remote building</i>	Route B <i>Repositioning behind tails between gates</i>	Route C <i>Minimising aircraft interference</i>
Peak hour pax departing	1097 pax	1097 pax	1097 pax
Peak hour pax arriving	1033 pax	1033 pax	1033 pax
Services per hour	21 (every 2.9 mins)	21 (every 2.9 mins)	21 (every 2.9 mins)
Bus loop duration	22 mins	26 mins	23 mins
Buses required	8 buses	9 buses	8 buses
Queuing area	165 sqm	165 sqm	165 sqm
Podiums	3 (12 sqm)	3 (12 sqm)	3 (12 sqm)
Waiting area (DTB)	850 sqm	850 sqm	850 sqm
Waiting area (remote)	800 sqm	800 sqm	800 sqm

6. Terminal layouts

Methodology

Terminal layout options have been developed for the four shortlisted options.

Terminal plans

The options were initially developed using areas from Arup's Programme of Facility Requirements (PoR) model developed in Phase 2 but have evolved to reflect the spatial conditions of the site and existing facilities such as the DTB.

An initial presentation of the terminal layout options was shared with Air New Zealand during Workshop 1, enabling feedback and revision for Workshop 2 and this draft report.

The 2043 terminal planning includes an overall site plan, level plans, sections and a block render for each of the shortlisted options. A combined set of plans is provided in Appendix A.

Baggage assessment

A key consideration for the terminal planning is the capacity of the proposed baggage infrastructure and space to accommodate future baggage demand. An independent review of the options and terminal layouts was undertaken by BNP on behalf of Air New Zealand to provide a second opinion on the merits of each option in terms of overall baggage system complexity, as well as baggage handling capacity and operations.

Minimum connect times

Feedback from the Air New Zealand squads on the Phase 2 report noted that the impact of Minimum Connect Times (MCTs) for transfer journeys should be further developed as part of the Phase 3 evaluation of each shortlisted option.

MCTs have been calculated for each passenger transfer journey between International \diamond Domestic \diamond Regional journey for each shortlisted option. These have been compared to the existing MCTs for each sector pairing as a reference.

6. Terminal layouts

Key findings

Key findings from the development of terminal layouts for each option are as follows:

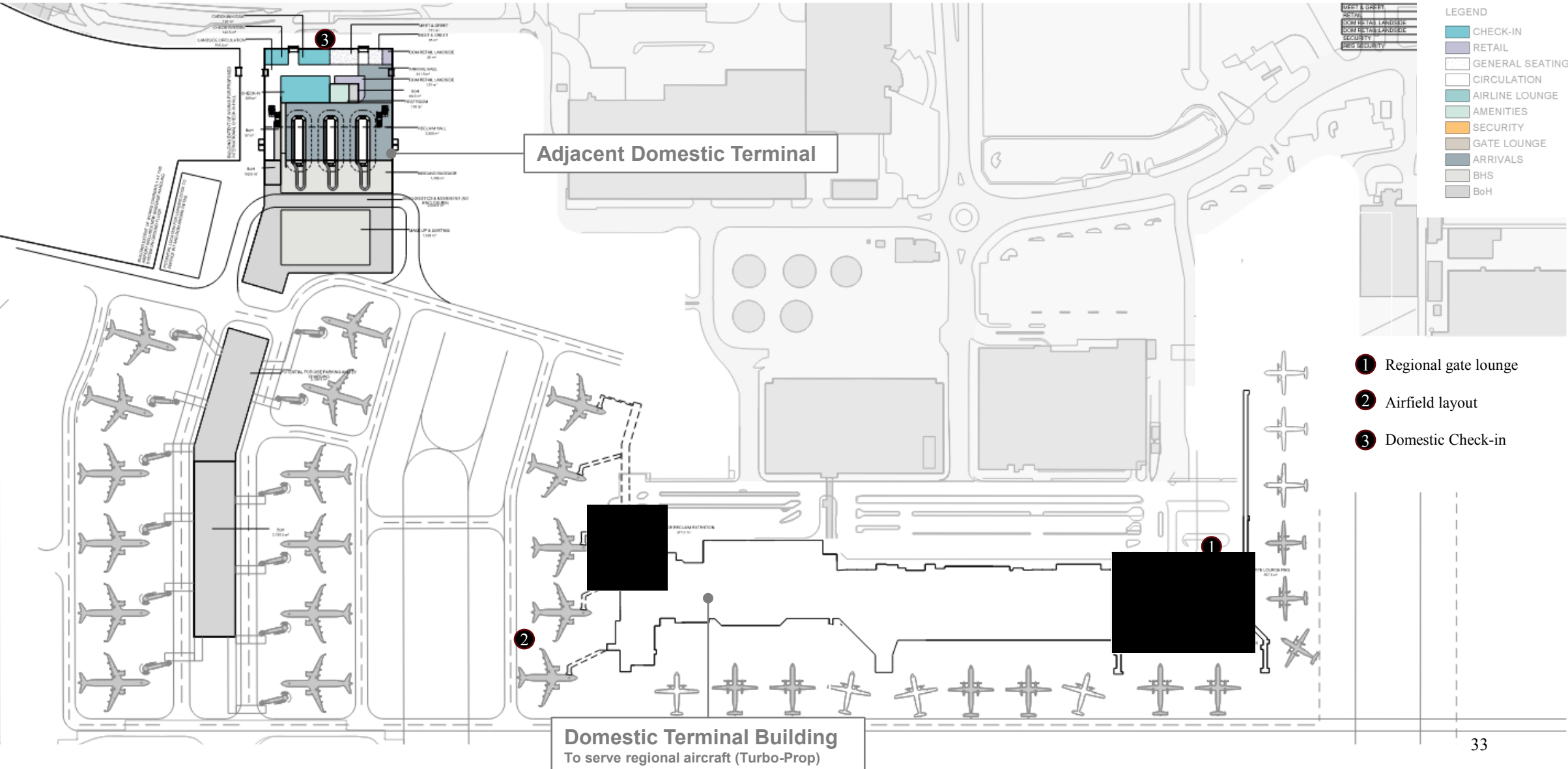
- In the Adjacent Domestic Terminal option, the new processor provides for all functions, including check-in, at IATA Optimum with a potential transfer connection to the International Terminal. Some Domestic jet processing remains on the DTB but this could be for a Low Cost Carrier, as per current operations. The baggage review by BNP noted that adequate space/capacity was provided for BHS facilities.
- The Eastern expansion option includes reconfiguration of the DTB including the incorporation of upgraded Regional and Domestic security. The baggage review by BNP noted that space was limited but workable.
- The DTB + Pier A1 option provides the fewest upgrades to the terminal facility and will not achieve IATA Optimum in terms of passenger Level of Service by 2043. BNP noted that the DTB + Pier A1 option was unlikely to be able to provide appropriate levels of baggage infrastructure, necessitating a remote baggage operation in Pier A1 to provide space for baggage handling.
- The Regional Headhouse option provides a Regional Headhouse which can accommodate all the necessary functions of a regional processor. The baggage review by BNP noted that adequate space/capacity was provided for baggage handling facilities in the DTB and the new Regional Headhouse.

In terms of the transfer passenger experience:

- The Adjacent Domestic Terminal option is the only one to show an improvement in MCTs, for both Int>Dom and Dom>Int transfer passengers. This is the only improvement in MCT for all transfer journeys across all options.
- Other MCTs were found to increase, particularly with inclusion of a remote pier in Eastern expansion and Remote Headhouse and subsequent bussing operation.
- Increases in Regional passenger journeys were shown in Regional Headhouse option owing to the Regional processor and stands being further north and east.

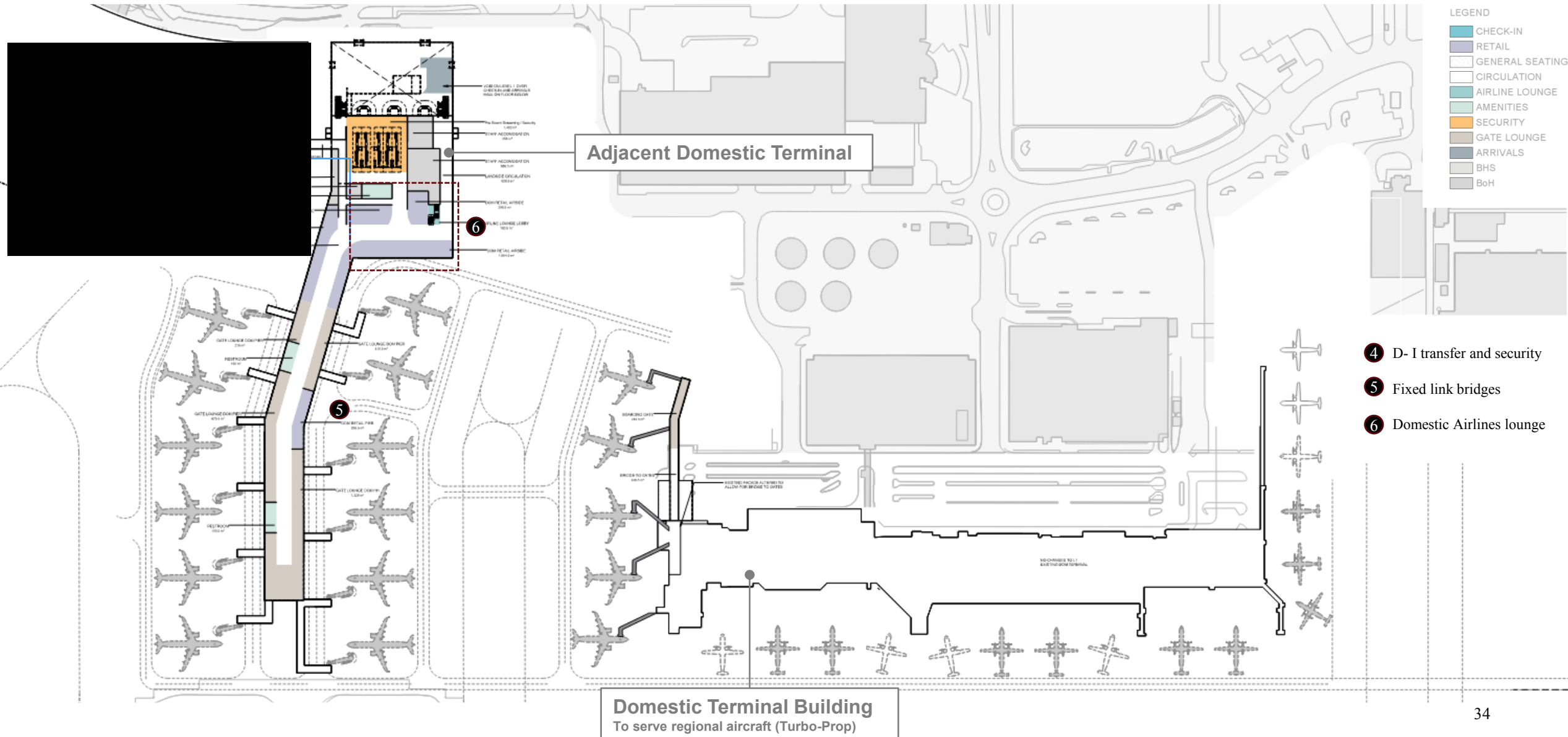
6. Terminal layouts

Adjacent Domestic Terminal - Level 0



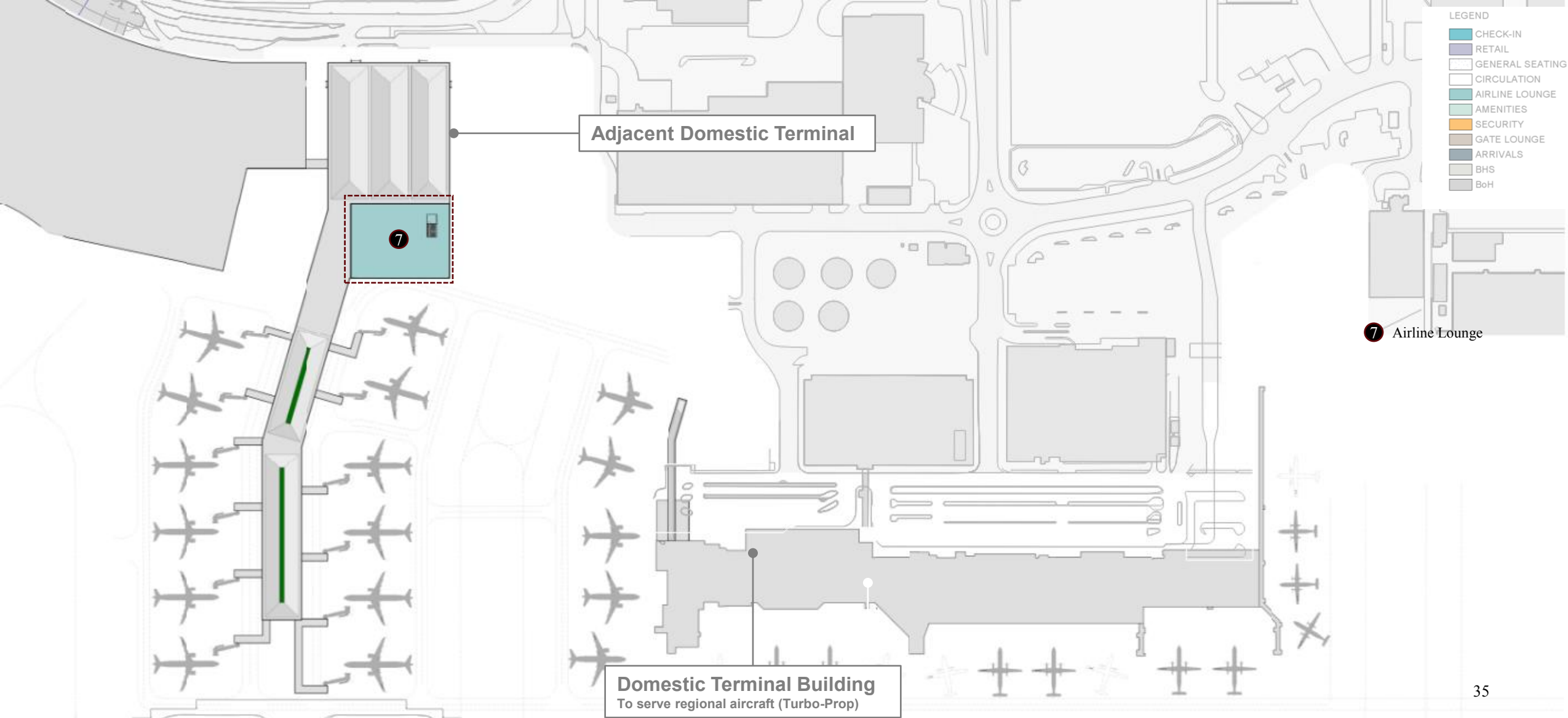
6. Terminal layouts

Adjacent Domestic Terminal - Level 1



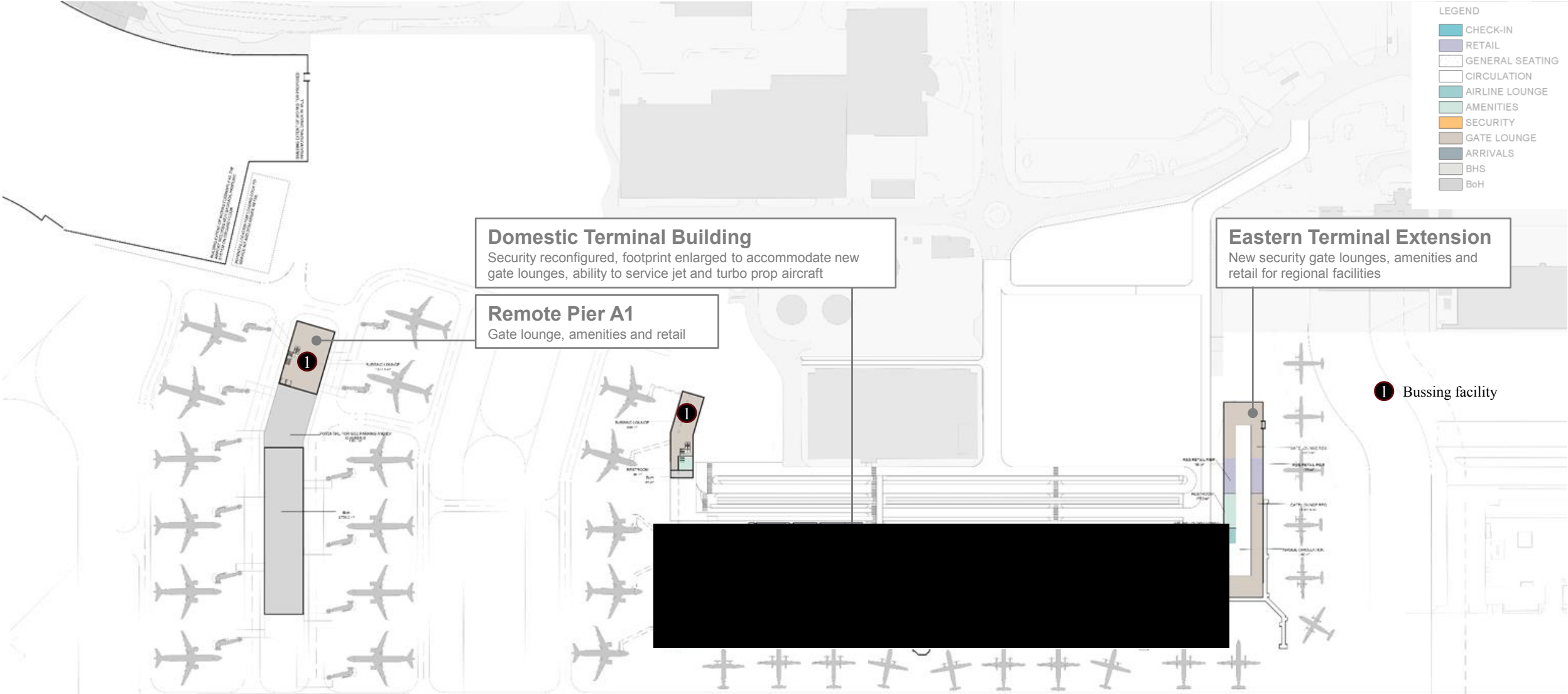
6. Terminal layouts

Adjacent Domestic Terminal - Level 2



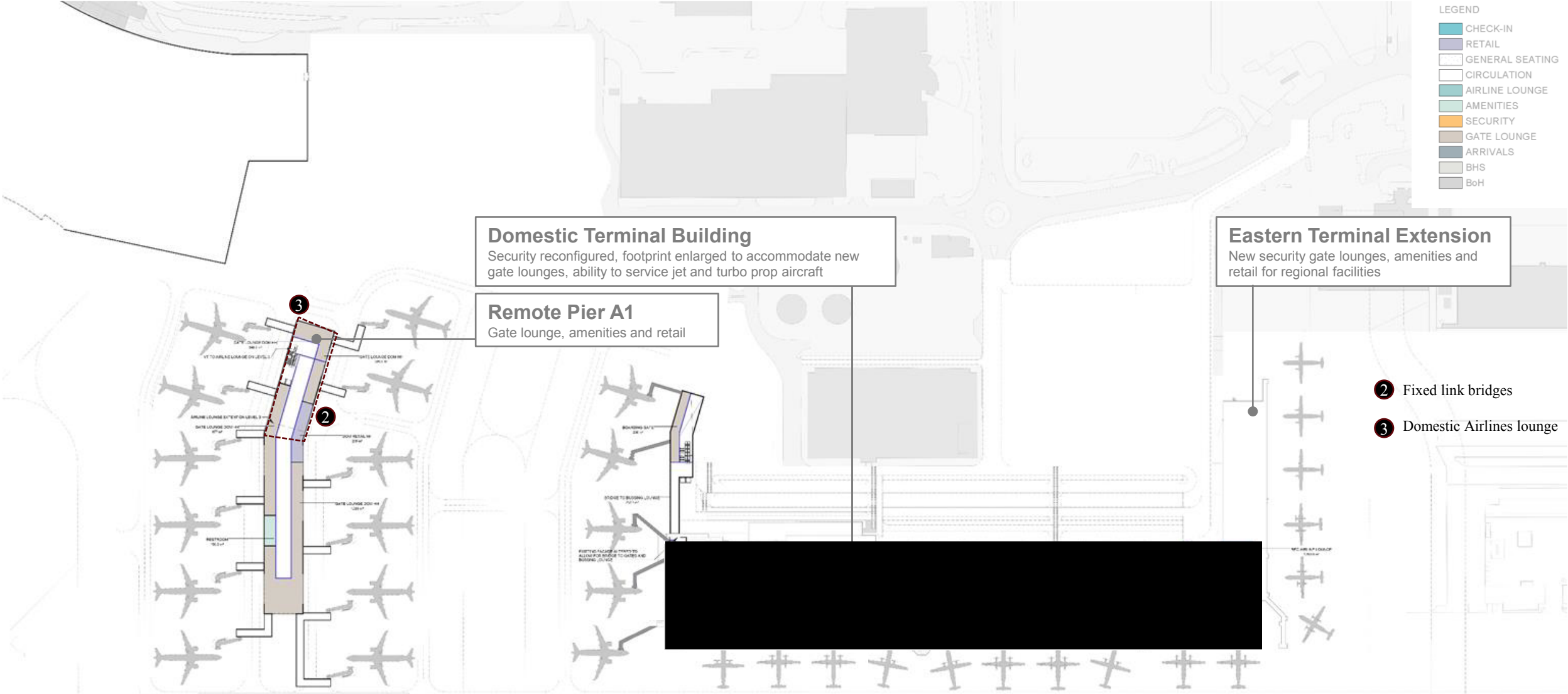
6. Terminal layouts

Eastern expansion - Level 0



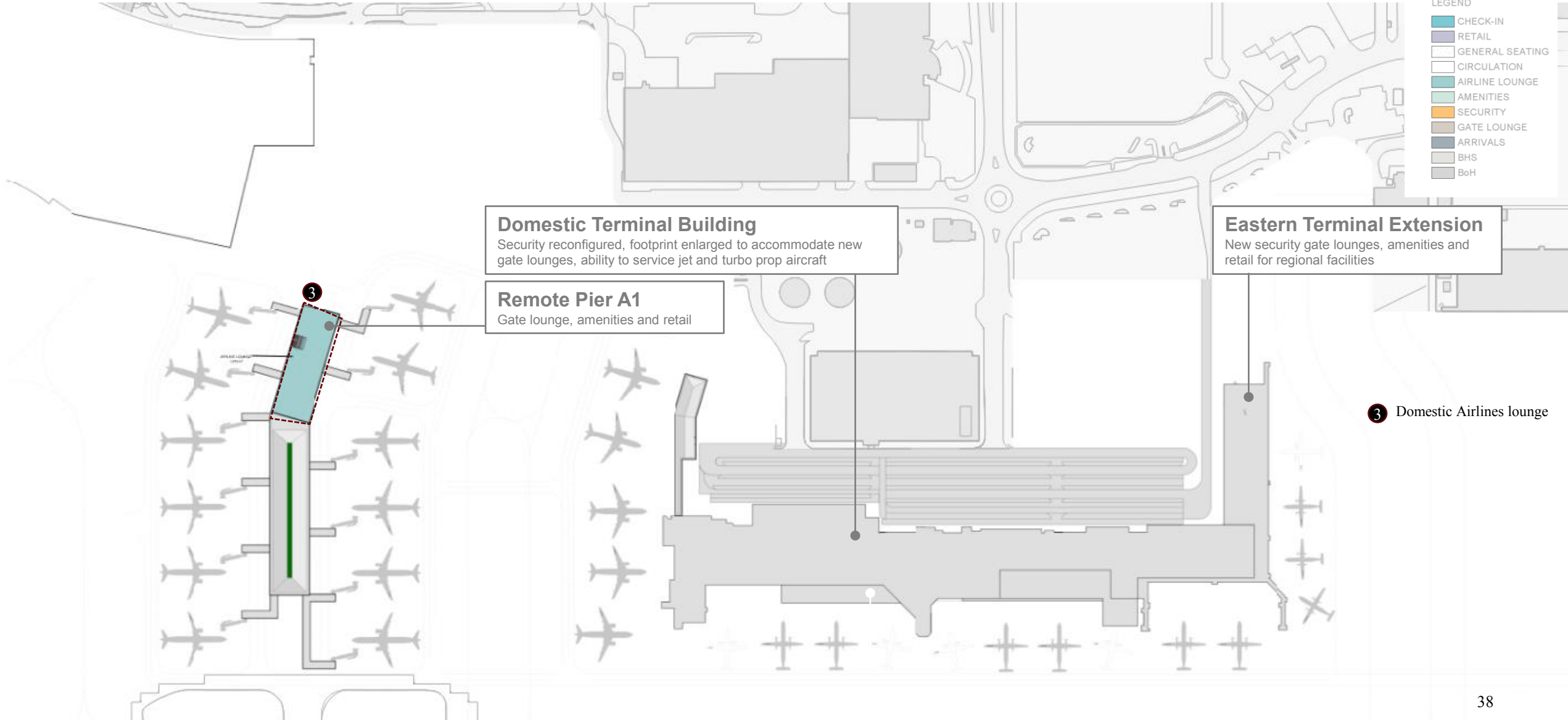
6. Terminal layouts

Eastern expansion - Level 1



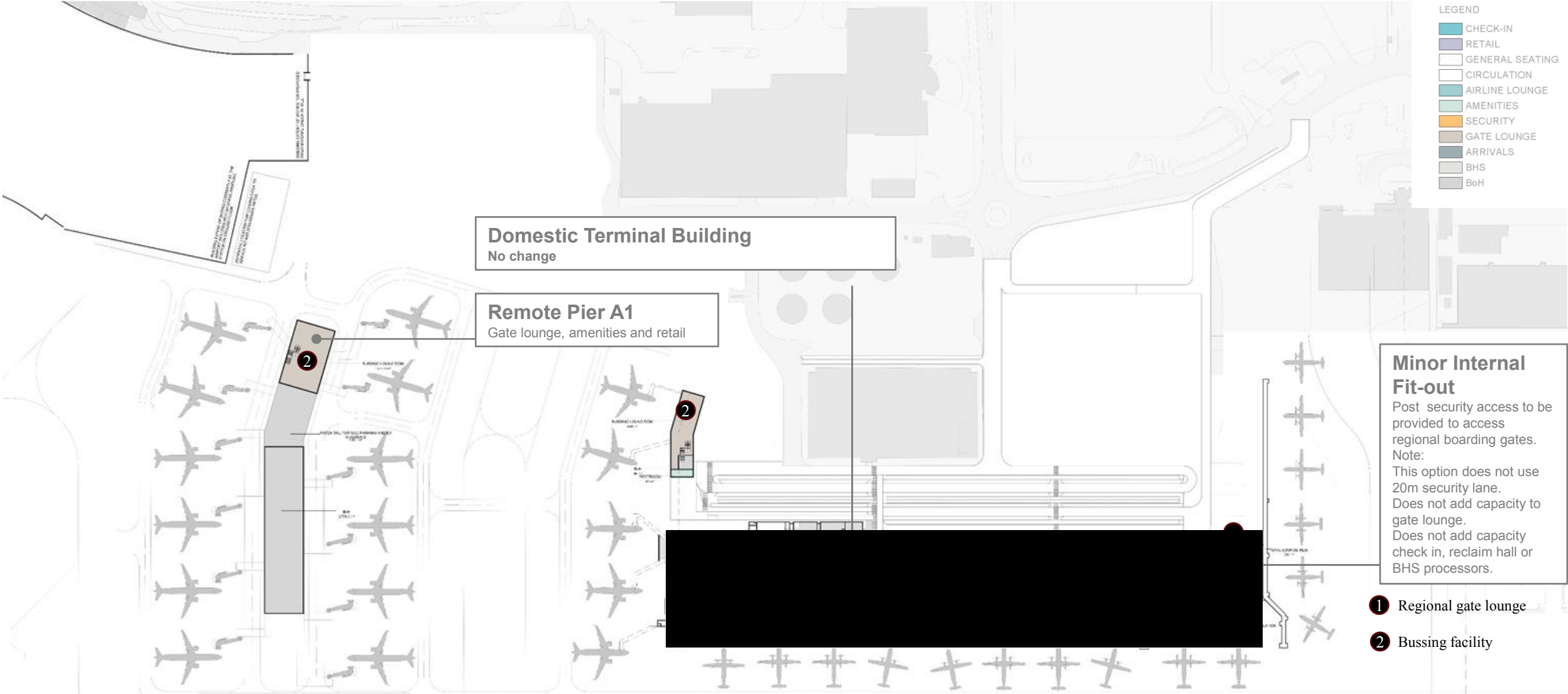
6. Terminal layouts

Eastern expansion - Level 2



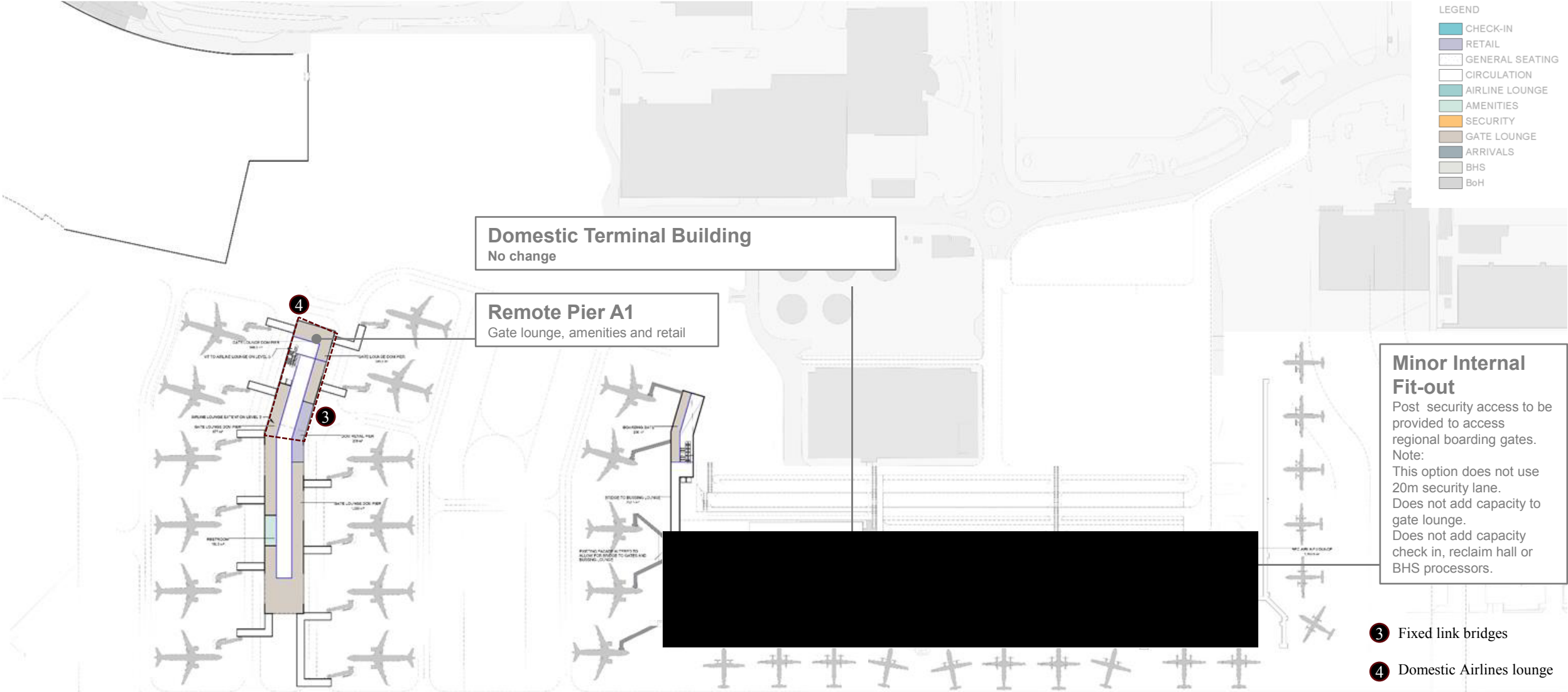
6. Terminal layouts

DTB plus Pier A1 - Level 0



6. Terminal layouts

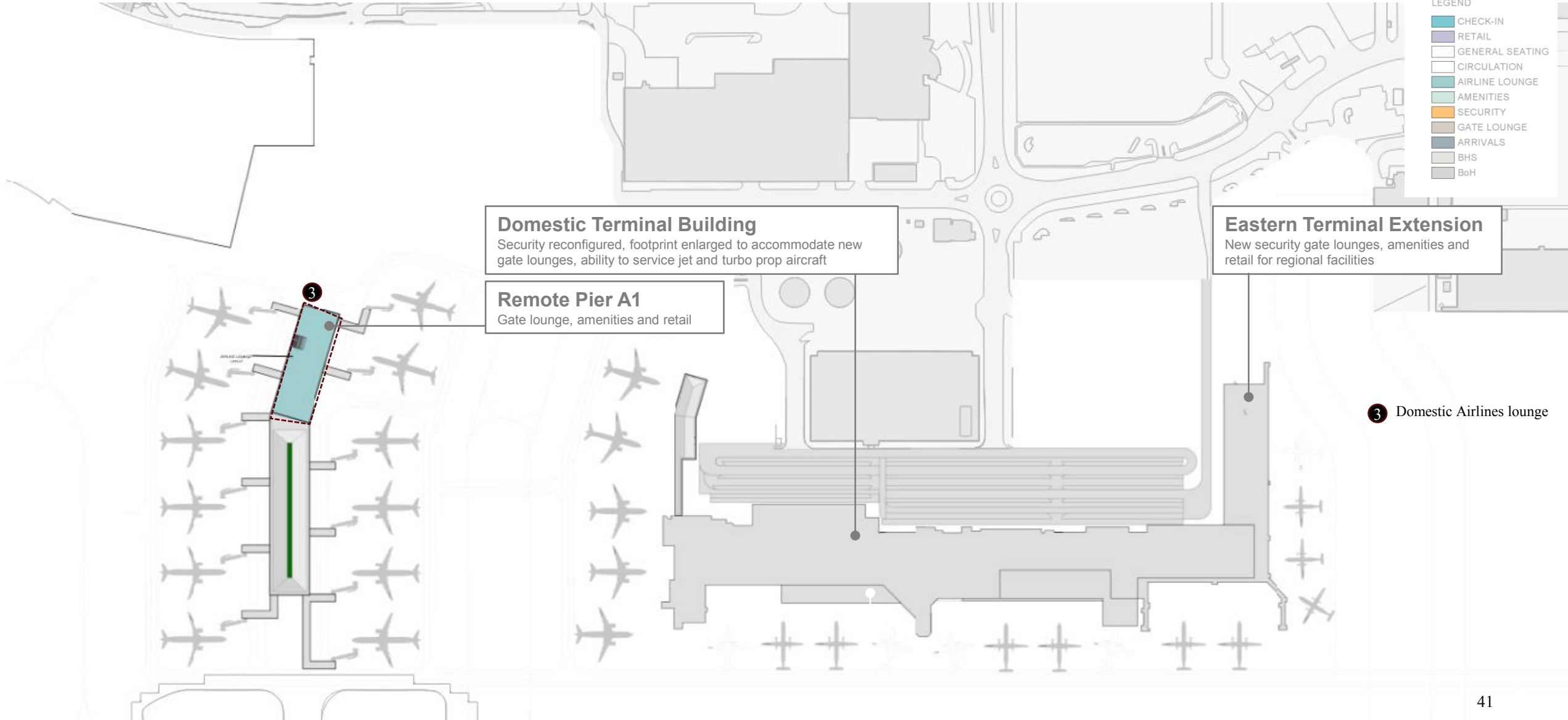
DTB plus Pier A1 - Level 1



- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

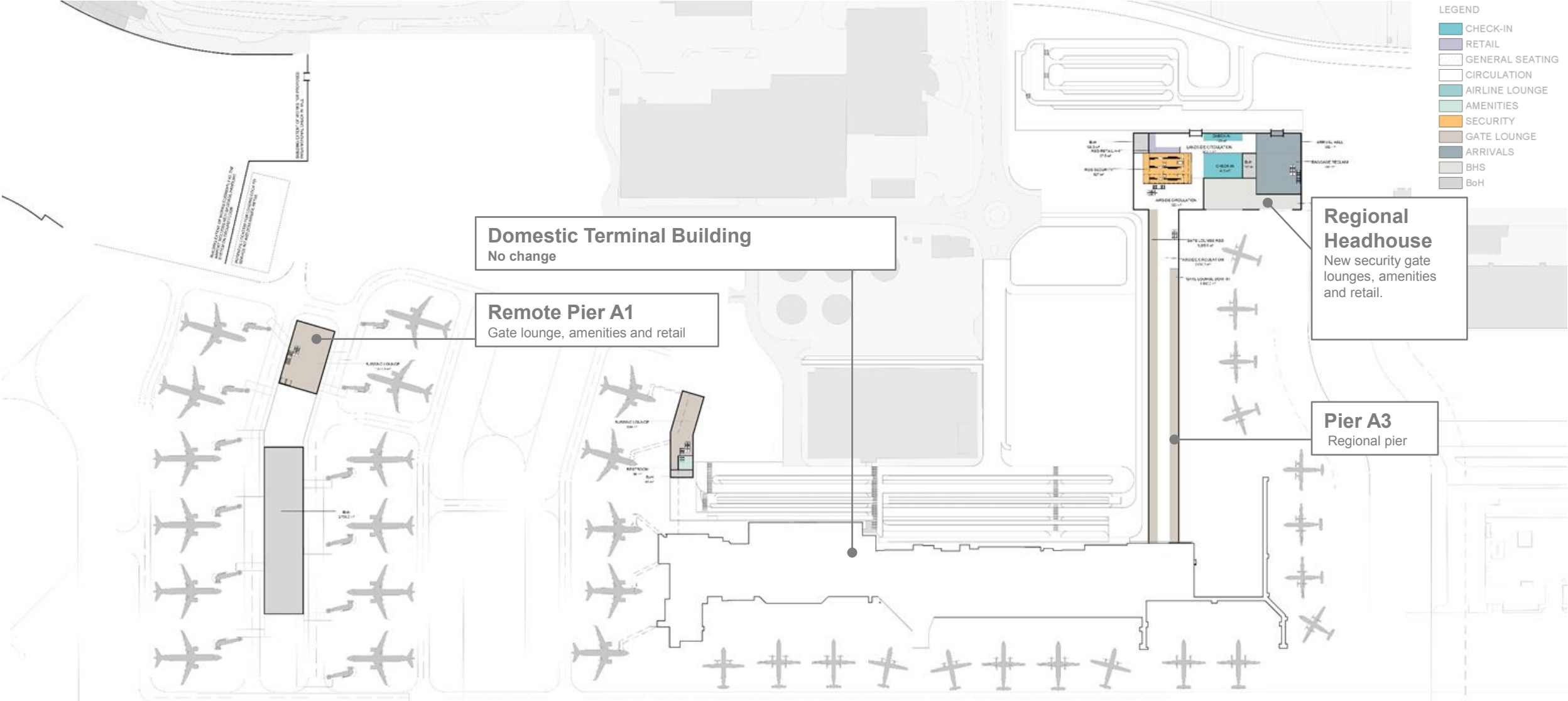
6. Terminal layouts

DTB plus Pier A1 - Level 2



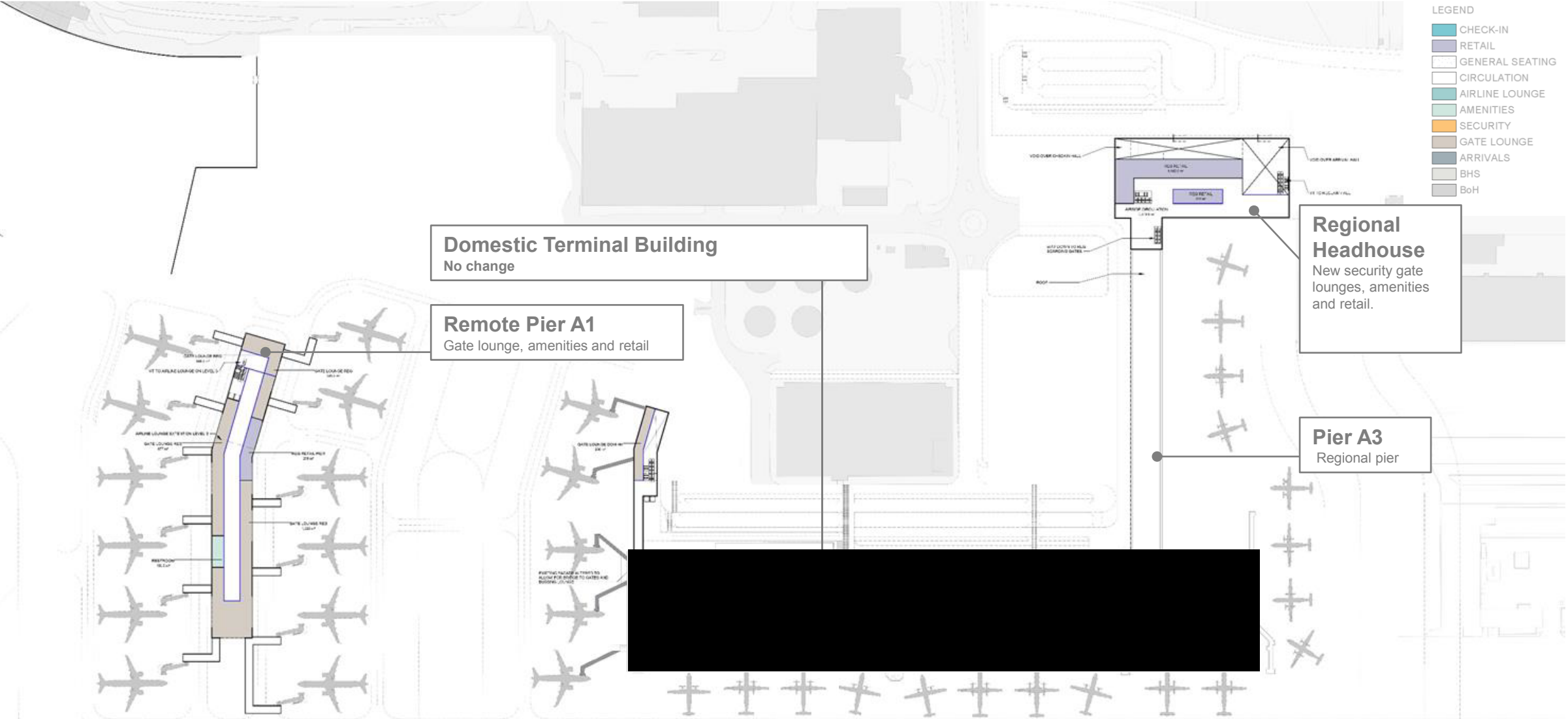
6. Terminal layouts

Regional Headhouse - Level 0



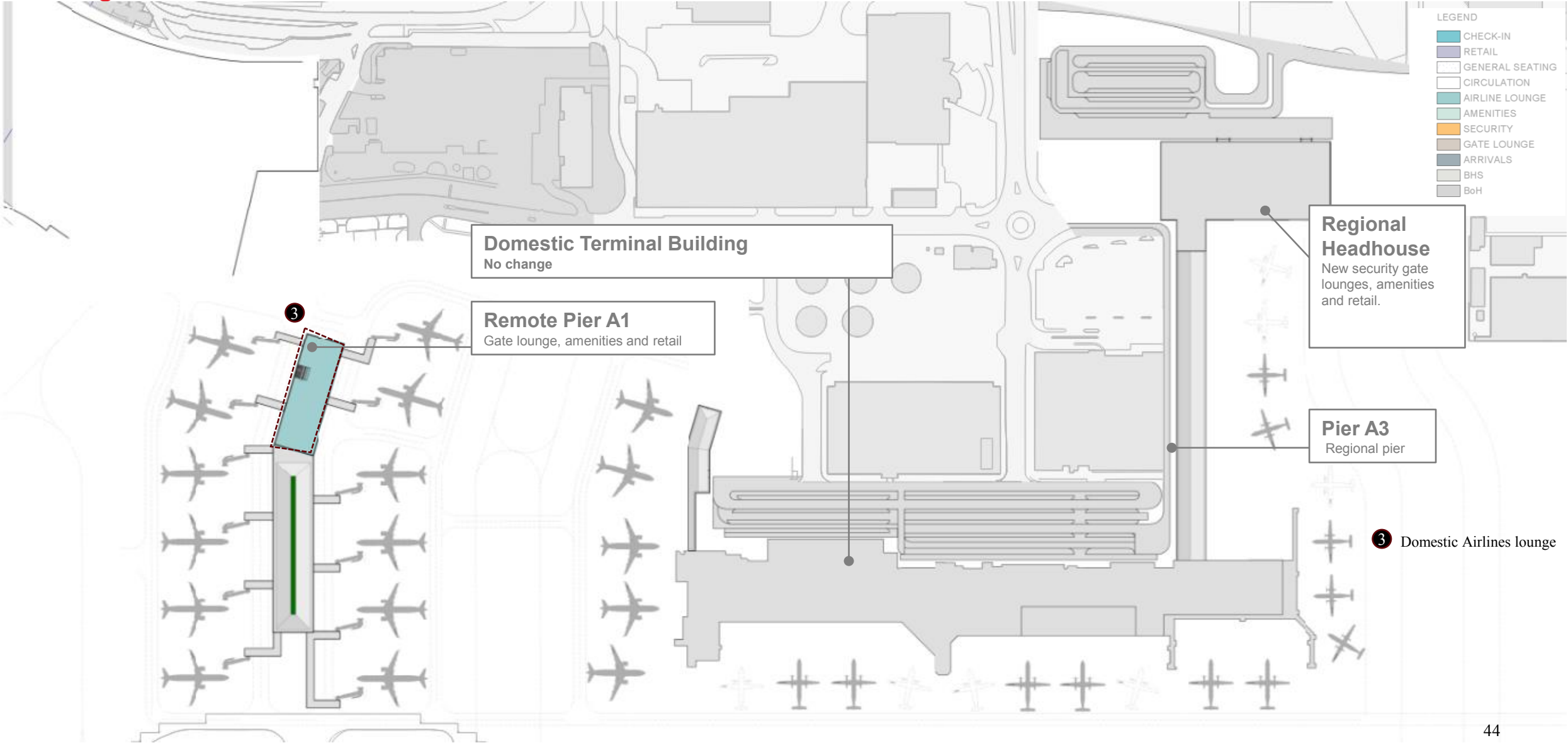
6. Terminal layouts

Regional Headhouse - Level 1



6. Terminal layouts

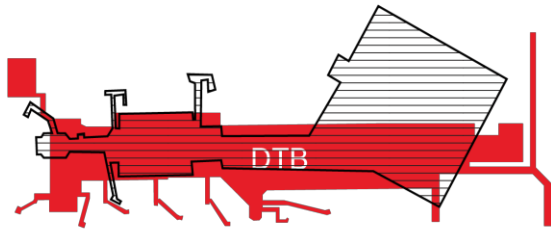
Regional Headhouse - Level 2



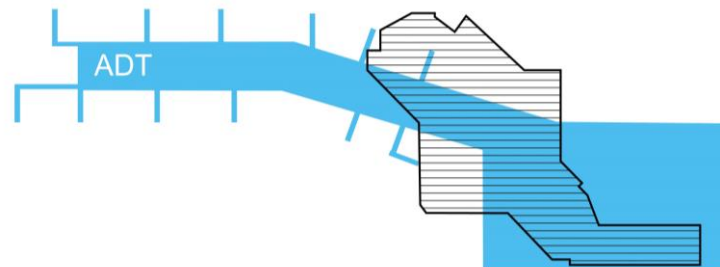
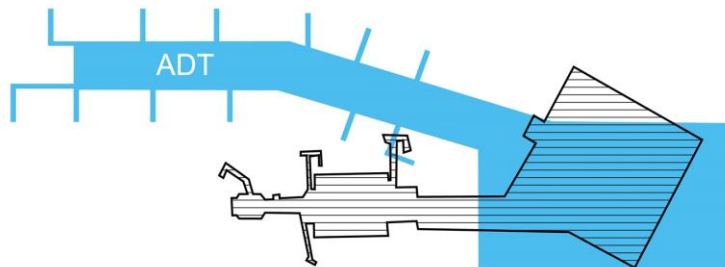
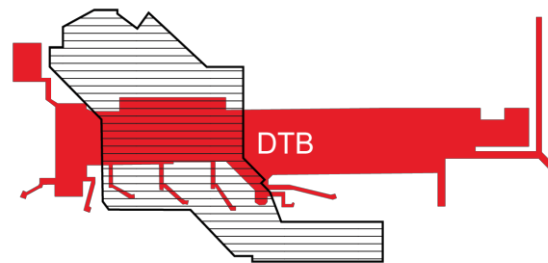
6. Terminal layouts

Benchmarking

WLG
Wellington Domestic
Terminal

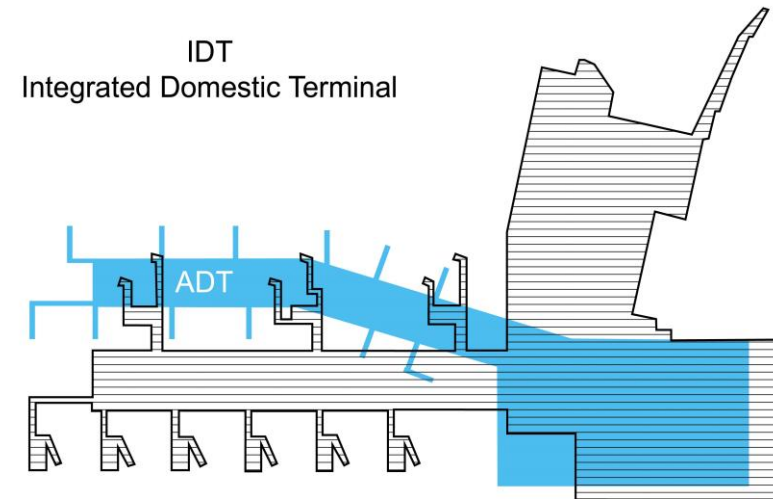


CHC
Christchurch Domestic Terminal



Terminal / Year	Demand in MPPA	Area in m ² per MPPA
DTB 2019	9.6	2,600
ADT 2043	11.4	3,050
IDT 2043	11.4	6,800
CHC 2019	5.1	5,100
WLG 2019	5.3	3,775

IDT
Integrated Domestic Terminal

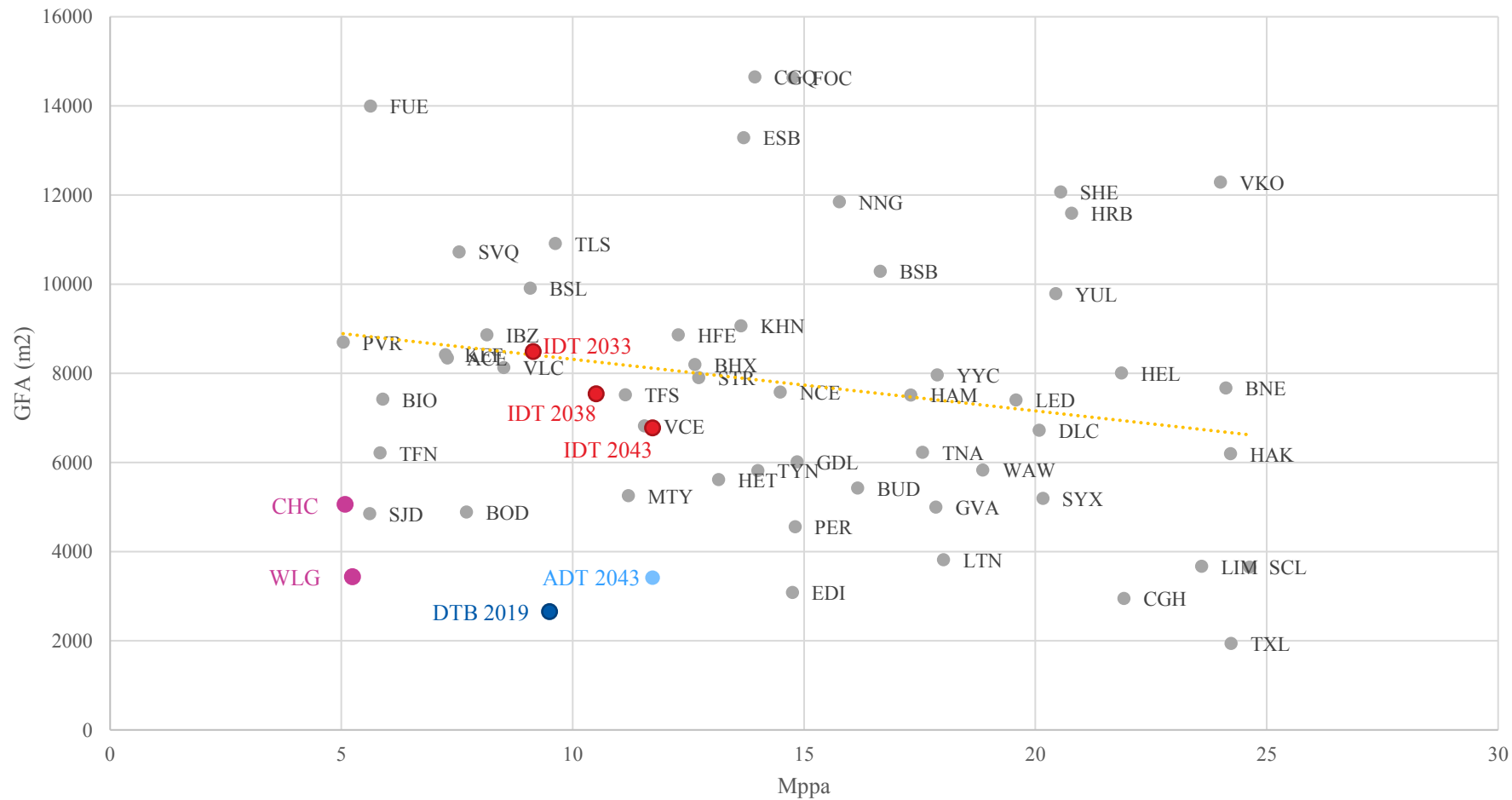


Note, Pier A1 for ADT and IDT have 12 stands

6. Terminal layouts

Benchmarking

Various Airports - GFA per Mppa



Note, benchmarks include Domestic and International Airports

6. Terminal layouts

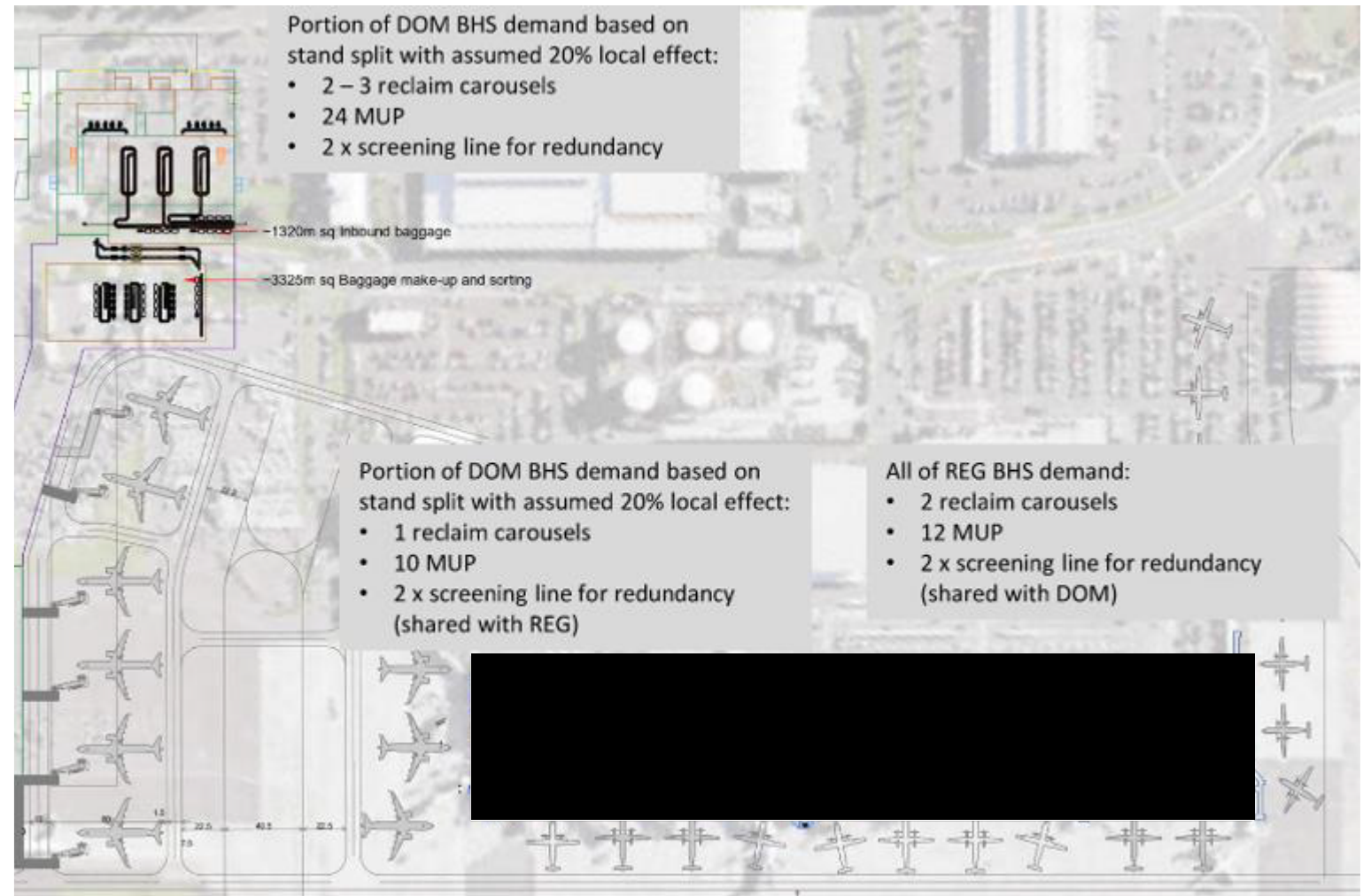
Baggage assessment: Adjacent Domestic Terminal

Summary

This option has adequate space for BHS facilities and generally efficient apron operation. BNP noted it as “workable as drawn”.

Notes

- BNP noted that, if there is a split DOM operation, it will require additional staffing and could create complexity in baggage operations. However, this option envisages Air New Zealand in the Adjacent Terminal with a Low-Cost Carrier on stands to the west of the DTB.
- Remote Pier A1 creates efficient apron and GSE operation.
- A new processor means that the existing domestic terminal will have spare capacity.
- Requires coordination of GSE routes and passenger routes across DTB apron.



6. Terminal layouts

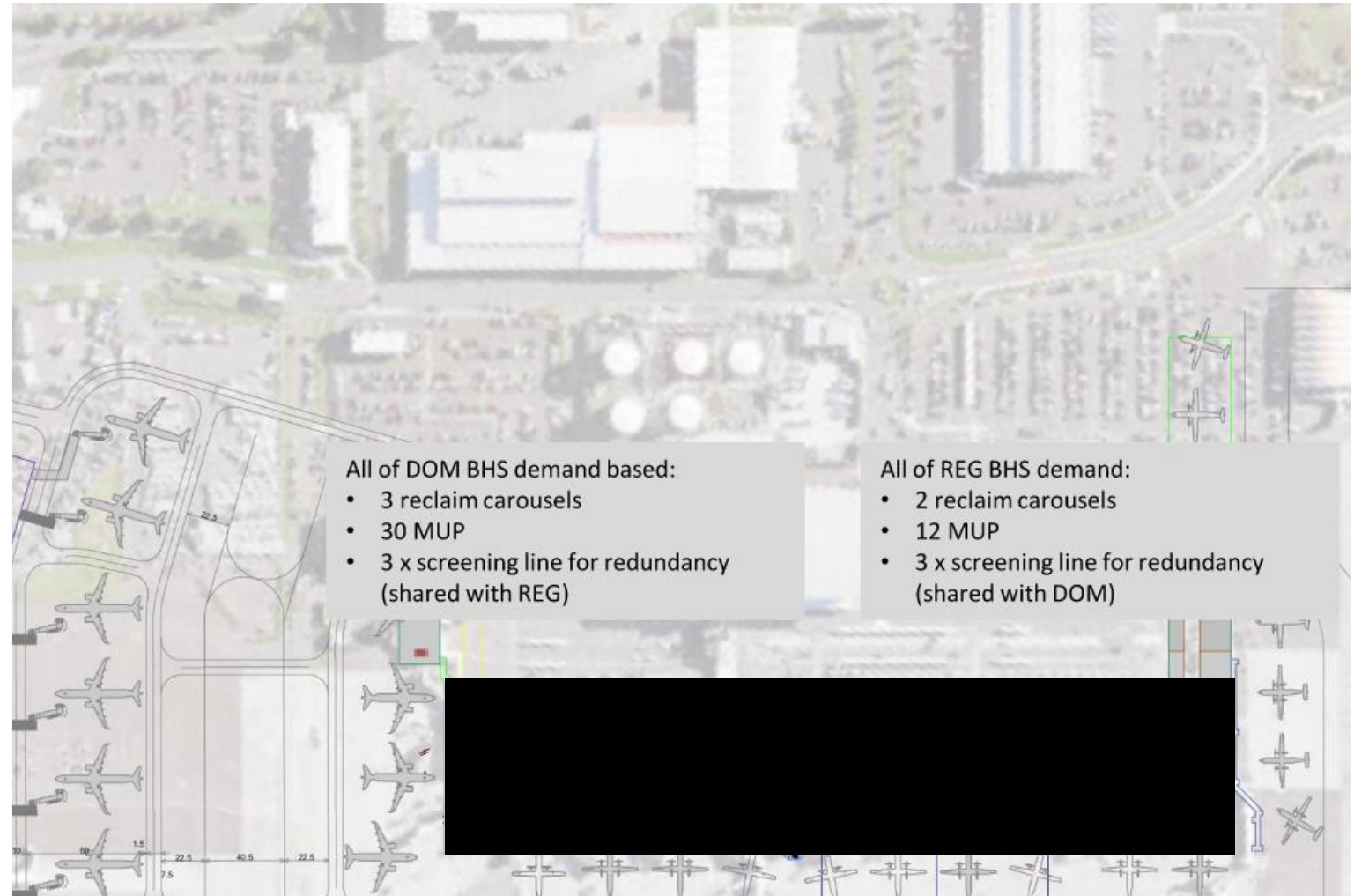
Baggage assessment: Eastern expansion

Summary

BNP concluded this option was workable. However, either space for check-in or baggage make-up will be constrained. The option also requires multiple locations for handling.

Notes

- Consolidated operation appears possible.
- Long distances to remote Pier A1.
- Western baggage make-up could potentially be used as handling area for transport to the new western pier.
- Limited space for Domestic reclaim and split reclaim as per current operation.
- Requires coordination of GSE and passenger routes across Regional apron.
- Space for check-in and screening systems is constrained.



6. Terminal layouts

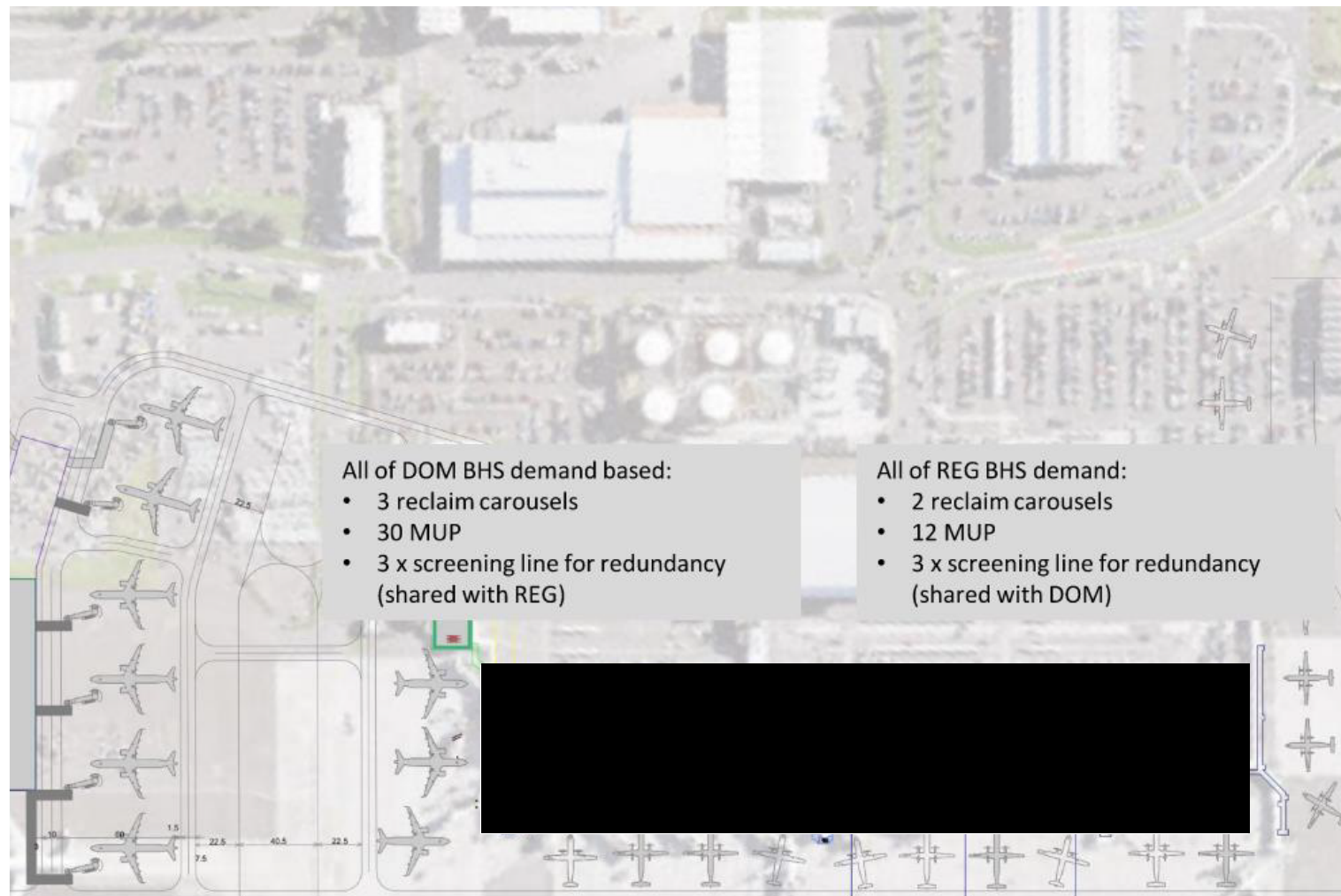
Baggage assessment: DTB plus Pier A1

Summary:

This option is unlikely to have enough baggage capacity. BNP concluded that some sort of remote baggage operation in Pier A1 would likely be needed to provide sufficient space for baggage facilities.

Notes

- Consolidated operation appears possible.
- Space for BHS too small in the DTB and therefore unlikely to provide appropriate capacity.
- Option exists for remote baggage hall in Pier A1 using a constant-headway bulk transport operation – will result in split baggage operation and additional drivers and GSE to support.
- Space for check-in and screening systems in DTB not likely to be achieved.



6. Terminal layouts

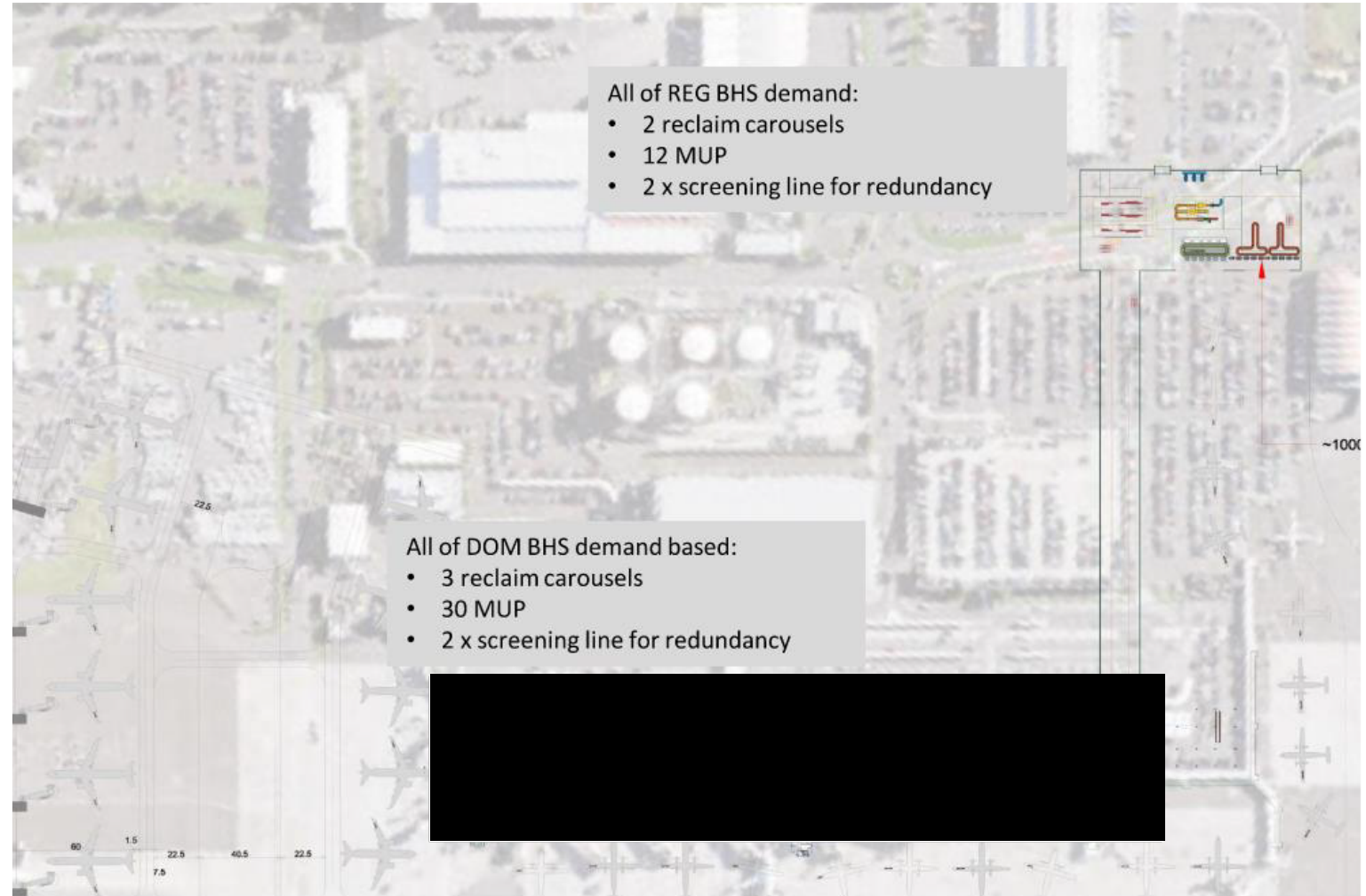
Baggage assessment: Regional Headhouse

Summary:

BNP considered this the most practical of options from a baggage perspective, although it retains a long transport distance to the western apron of Pier A1. BNP noted it as “workable as drawn”.

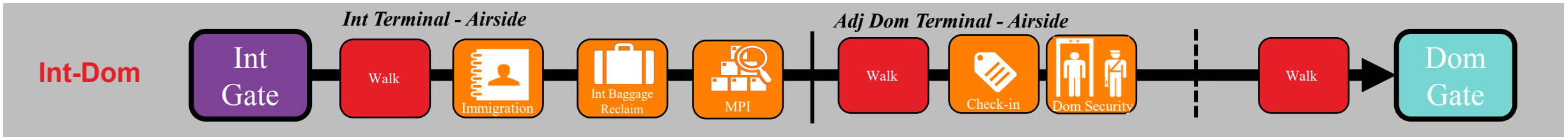
Notes

- Space for BHS is good with both Domestic and Regional able to be accommodated.
- Arrangement of Regional bag hall vs Regional apron provides good GSE/passenger segregation.
- Split operation of Domestic and Regional adds operational cost and equipment cost if Regional screening introduced.
- Long distance to Pier A1 which will require additional drivers and GSE.



6. Terminal layouts

Minimum Connect Times



Existing MCT: % of Air NZ transfers:

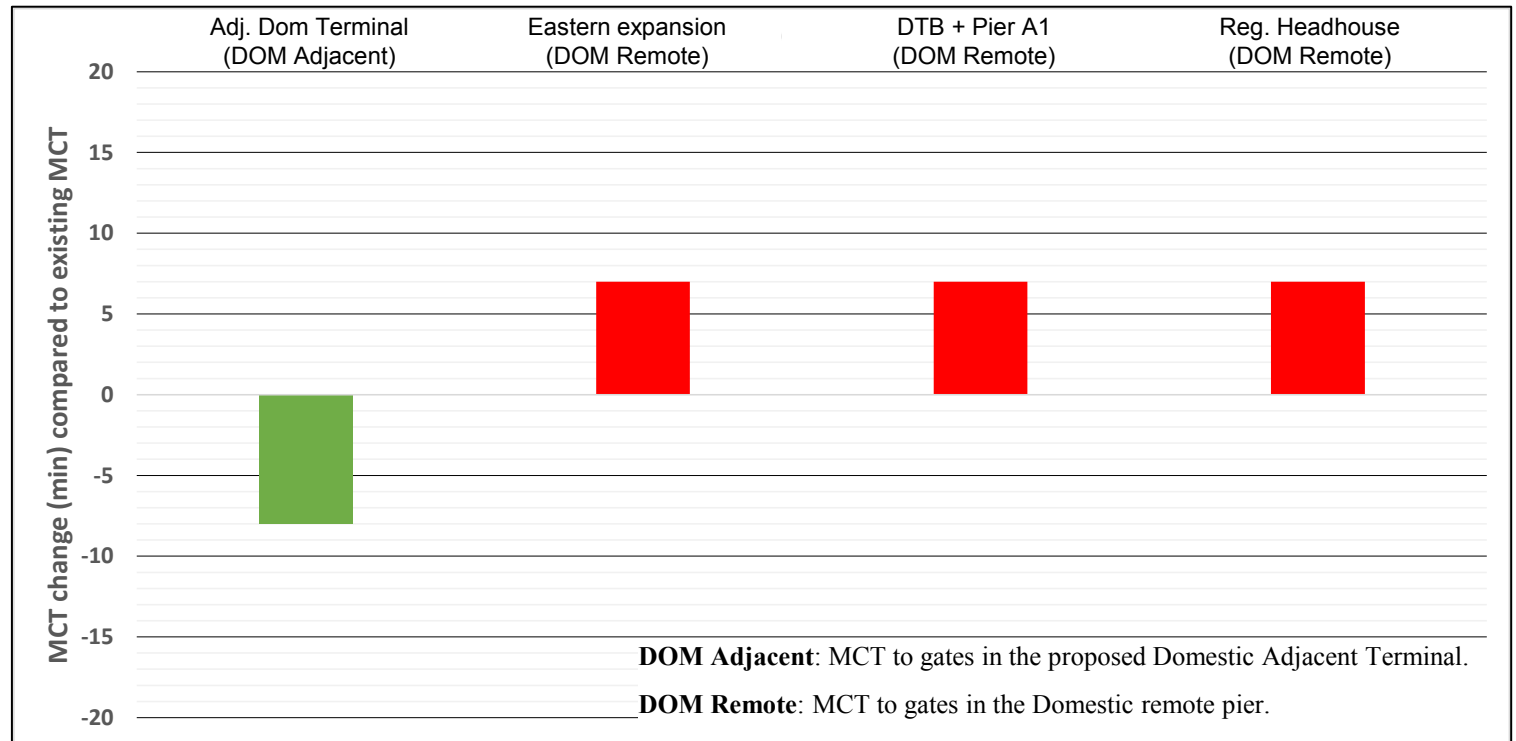
80 minutes

17%

Findings:

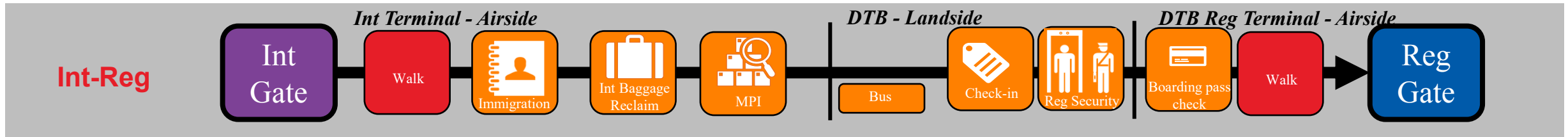
- Improvement in MCT with in the Adjacent Domestic Terminal option which eliminates the need for travel between the International and Domestic Terminals.
- Increase in MCT in other options owing to the requirement to bus passengers between the DTB and proposed remote pier.

Option MCT comparison:



6. Terminal layouts

Minimum Connect Times



Existing MCT: % of Air NZ transfers:

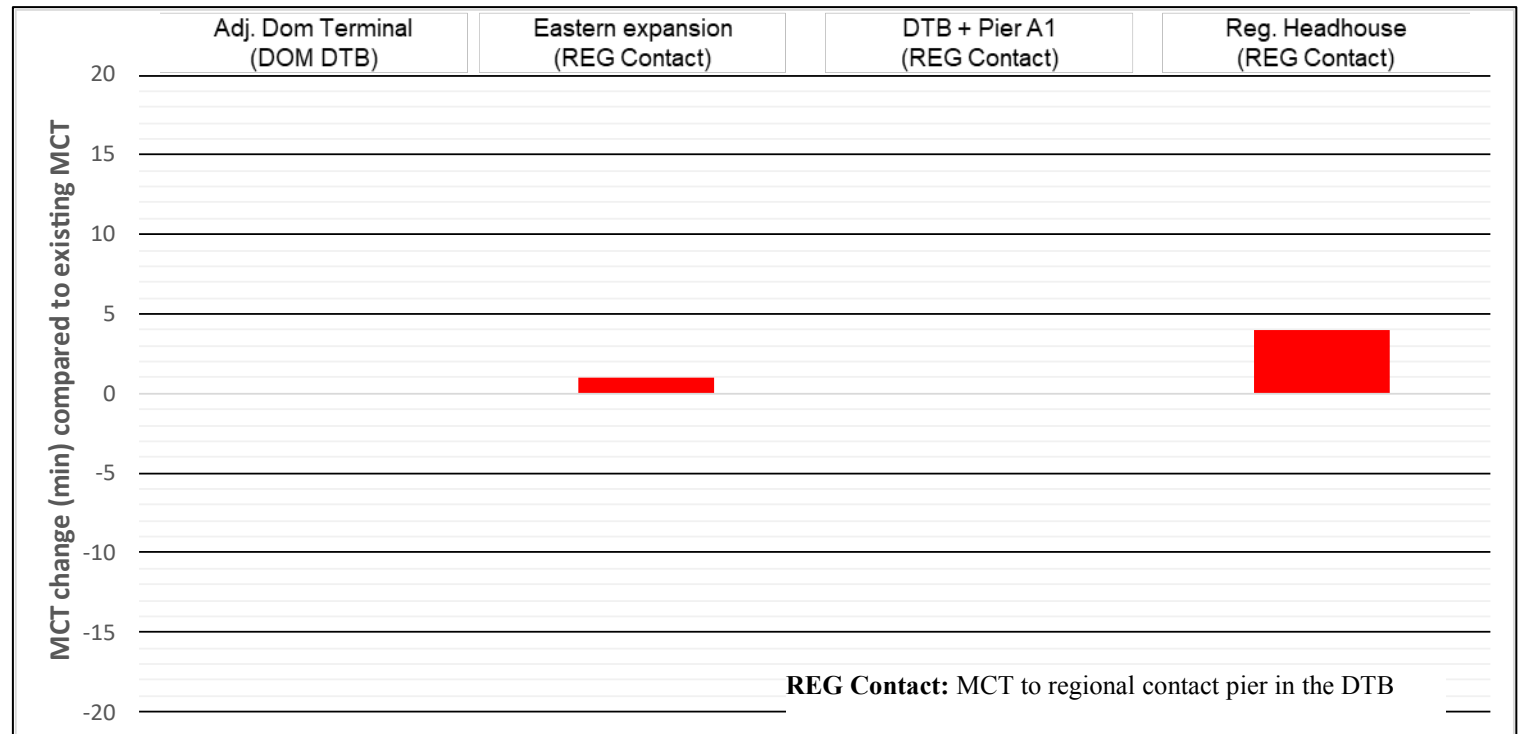
88 minutes

19%

Findings:

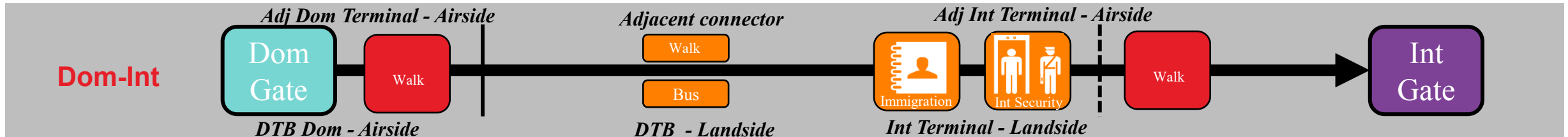
- Comparable MCTs in all options as the relationship between International and Regional stands remains the same.
- Minor increase in MCT in Eastern expansion and Regional Headhouse options owing to additional walking distance to new Regional stands.

Option MCT comparison:



6. Terminal layouts

Minimum Connect Times



Existing MCT: % of Air NZ transfers:

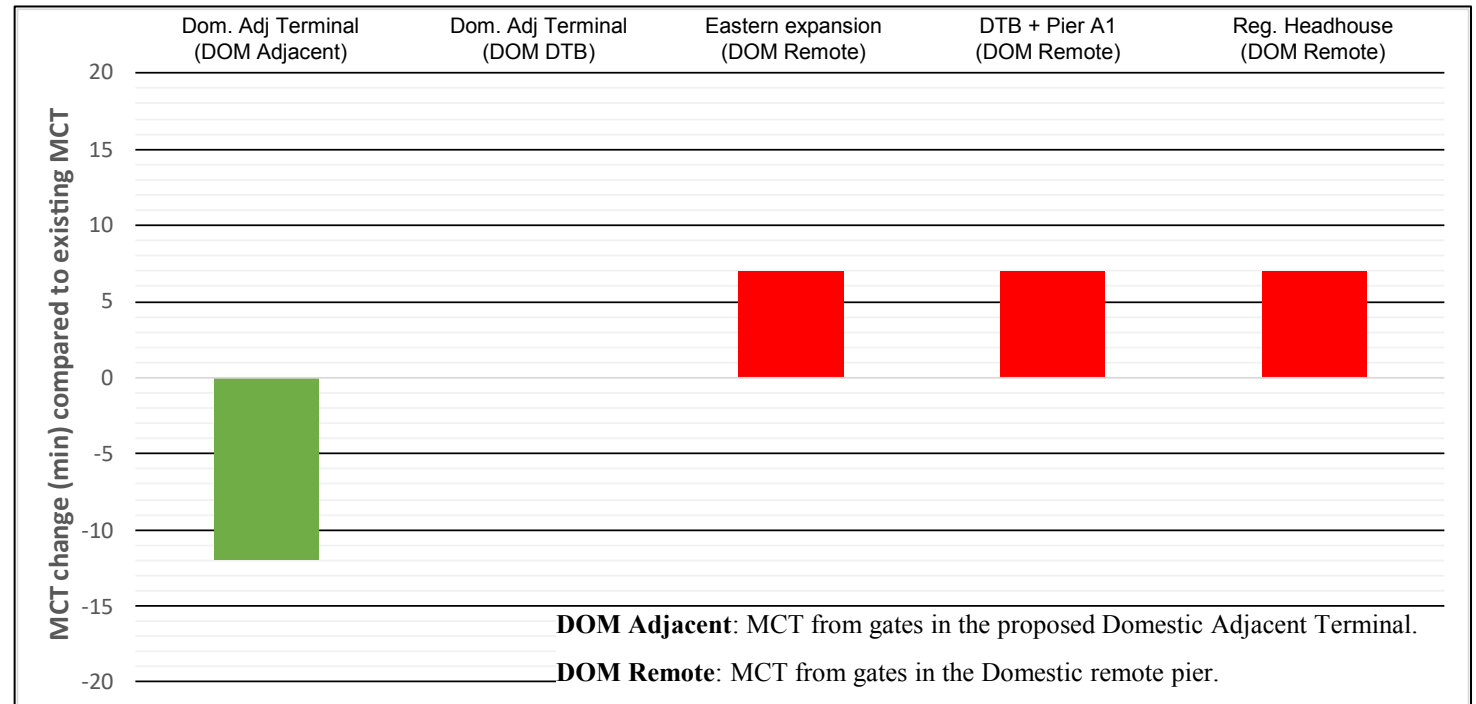
42 minutes

18%

Option MCT comparison:

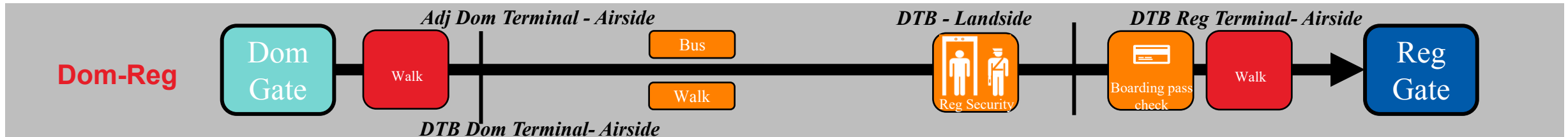
Findings:

- Improvement in MCT with the Adjacent Domestic Terminal option which eliminates the need for travel between the International and Domestic Terminals.
- Increase in MCT in other options owing to the requirement to bus passengers between the DTB and proposed remote pier.



6. Terminal layouts

Minimum Connect Times



Existing MCT: % of Air NZ transfers:

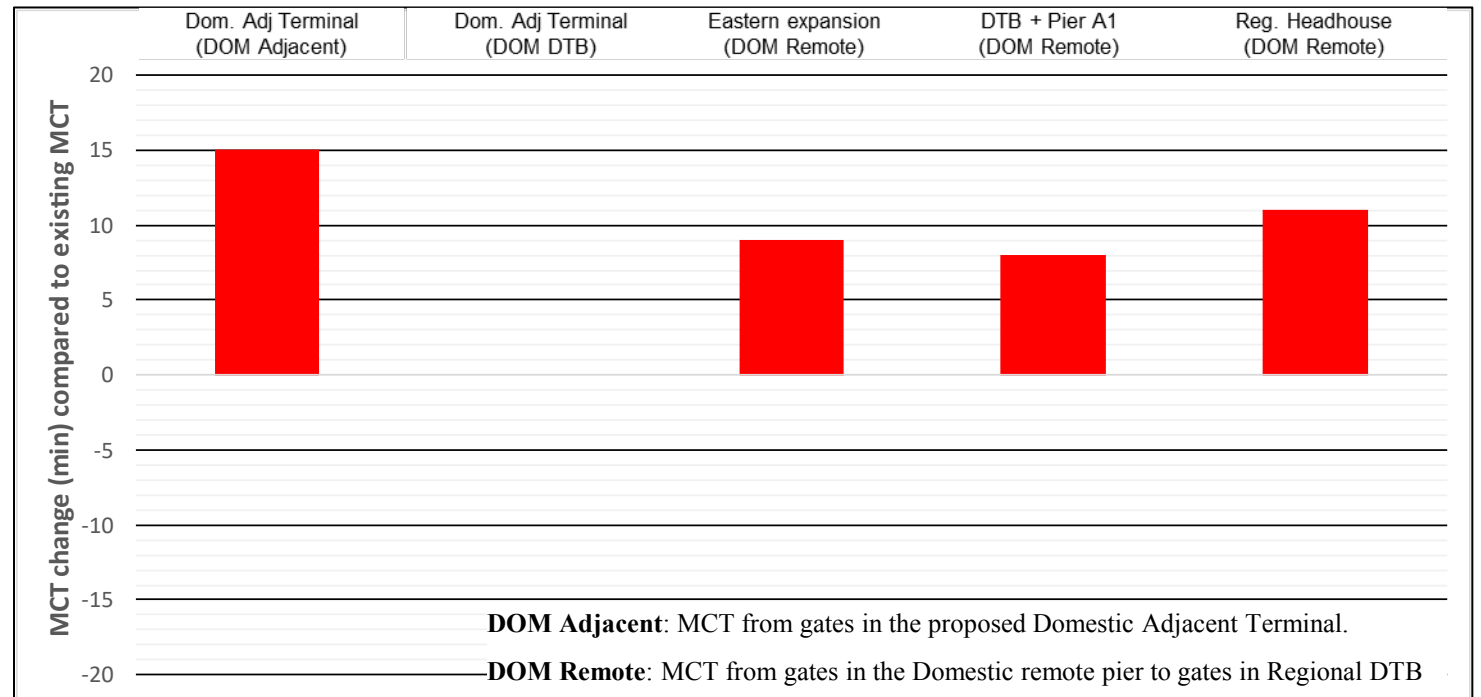
18 minutes

6%

Option MCT comparison:

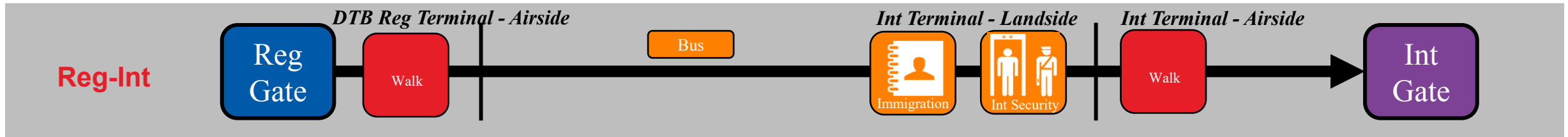
Findings:

- Increase in MCT in all options owing to requirement to bus passengers between remote stands and DTB.
- MCT for Domestic (from the DTB) to Regional remains as per existing for most options. There is a 4 minute increase in the Regional Headhouse option.
- The low percentage of Air New Zealand’s passenger transfers means it is less impactful than other MCTs.



6. Terminal layouts

Minimum Connect Times



Existing MCT: % of Air NZ transfers:

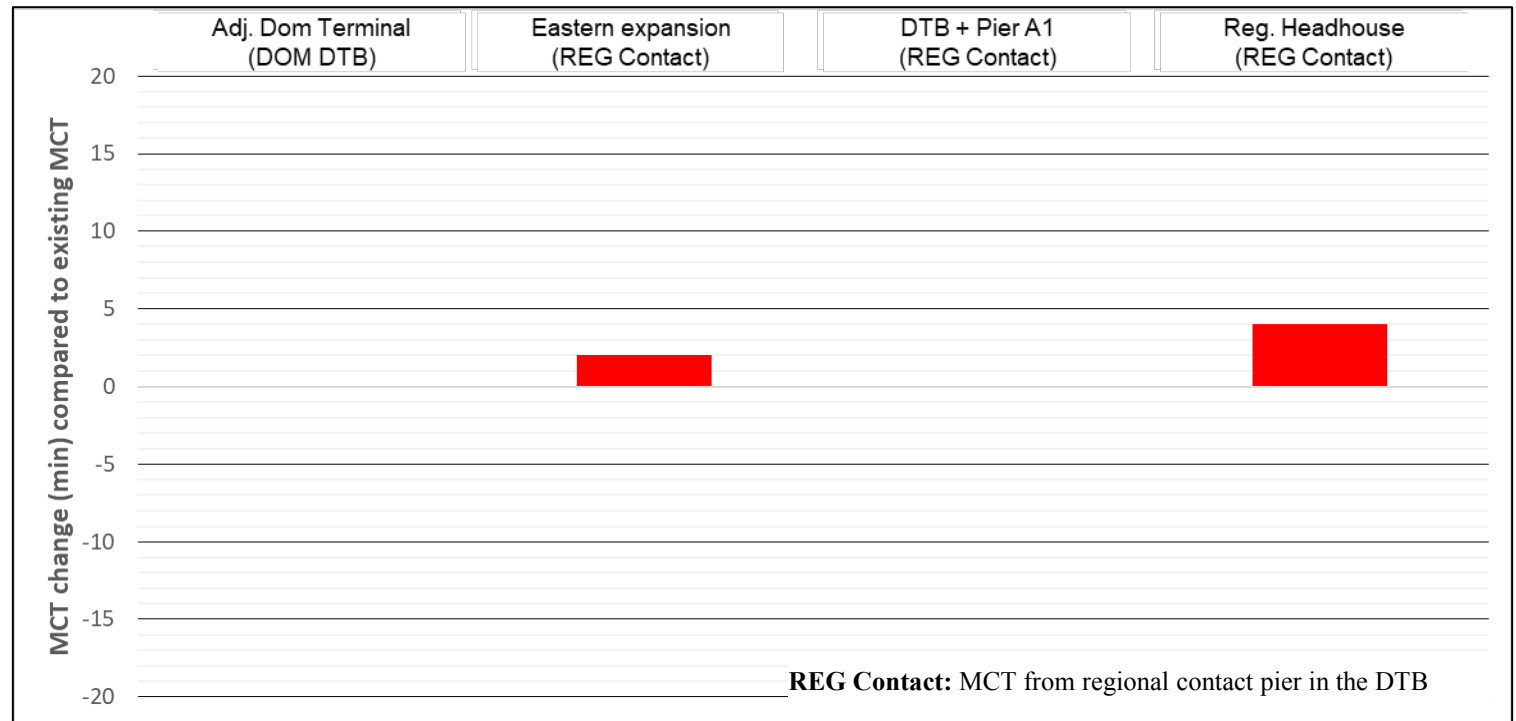
44 minutes

10%

Findings:

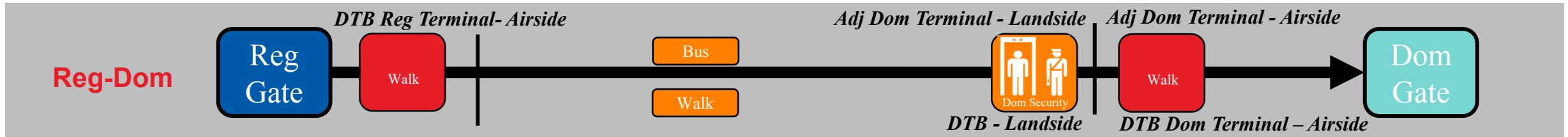
- Comparable MCTs in all options as the relationship between International and Regional stands remains the same.
- Minor increase in MCT in Eastern expansion and Regional Headhouse options owing to additional walking distance to new Regional stands.

Option MCT comparison:



6. Terminal layouts

Minimum Connect Times



Existing MCT: % of Air NZ transfers:

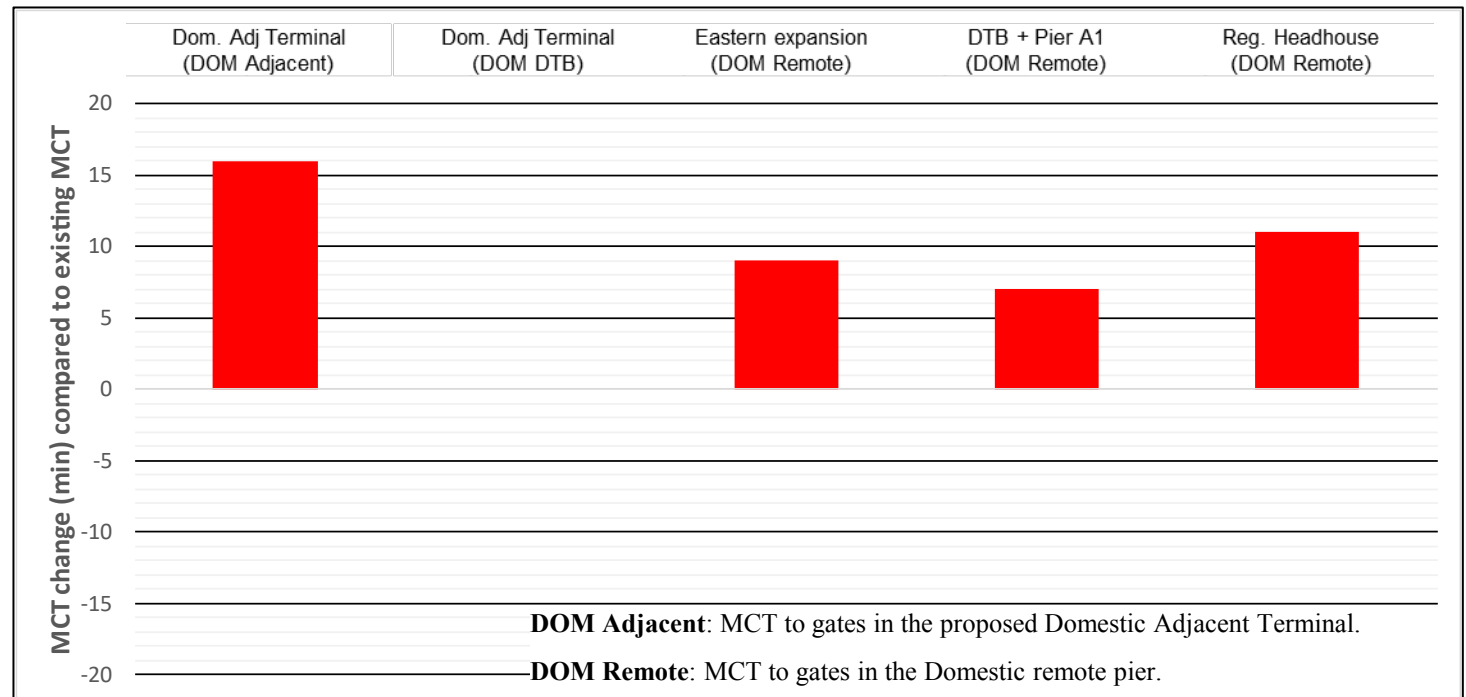
18 minutes

6%

Option MCT comparison:

Findings:

- Increase in MCT in all options when considering transfer of passengers from Regional stands to the Domestic stands on Pier A1.
- The low percentage of Air New Zealand’s passenger transfers means it is less impactful than other MCTs.



7. Landside planning

Methodology

The landside planning and development of layouts for each option was informed by future 2043 busy hour passenger demands by sector input into a Kerbside Estimation Model (KEM) to understand future requirements in the forecourt.

Kerbside assumptions

A series of assumptions underpin the assessment based on data from Phase 2 as well as experience from other comparator airports. These include the elements listed below which are described further on subsequent slides:

- Demand factors
- Mode share
- Dwell time
- Vehicle occupancy
- Bus timetabling
- Car parking requirements.

Design development

A landside transport layout was developed for the Eastern expansion, DTB plus Pier A1 and Regional Headhouse options to accommodate the kerbside demand requirements output from the KEM.

Options showed the kerbside arrangements including road, kerb and parking areas. These also show the typical road network changes and where intersection upgrades would be required to accommodate future traffic demands.

It was agreed during Workshop 1 that a layout design would not be required for the Adjacent Domestic Terminal option as it is Master Plan aligned and the development of the new Ground Transport Hub and expanded kerbside areas would accommodate Adjacent Domestic Terminal requirements (just as they will the Integrated Domestic Terminal proposed by AIAL).

Final landside plans were presented to Air New Zealand in Workshop 2.

7. Landside planning

Key findings

Key findings from the development of the landside and forecourt arrangements for the four shortlisted options are as follows:

- Restrictions to dwell in the forecourt will need to be integrated in future years to reduce the kerbside length required.
- Kerbside demand estimates showed that a kerbside length of approximately 1,150m would be required to accommodate the Domestic and Regional sector demand in 2043.
- An additional 2,200 short term car parking spaces are likely to be required by 2043.
- Additional long-term car parking will also be required but has not been shown as it is assumed to be provided away from the DTB precinct and in line with AIAL provisions, noting that long-term parking is most common for International passengers.
- The required kerb length was able to be accommodated in the Eastern expansion, DTB plus Pier A1 and Regional Headhouse options. Regional Headhouse provides for a split of kerbside space between the Regional headhouse and the DTB.
- Products with higher dwell times including Commercial pick-up and pre-booked taxi are proposed to be accommodated in adjacent car parks.
- Valet products were also proposed to be accommodated in the adjacent car parks. This will represent a reduced level of service compared to the existing Valet offering at the DTB in the Eastern expansion and DTB plus Pier A1 options, as the car parks are not as proximate to the terminal processor in these two options.
- It is noted that none of the re-designed landside options consider the impact on the wider road network. Previous studies indicated that additional northbound and southbound traffic demand through the George Bolt Memorial Drive / Tom Pearce Drive would reduce the level of service of the road network.

7. Landside planning

Kerbside demand

Demand factors used to allow for variance and account for the utilisation of infrastructure:

- Assumed a 'peak within the peak' of 30% of hourly vehicles in 15min.
- Similarly, kerbside designed for 80% efficiency of space utilisation.

PEAK FACTOR

Mode	Factor
Peak factor (% hour demand in 15min)	30.0%

Utilisation rate

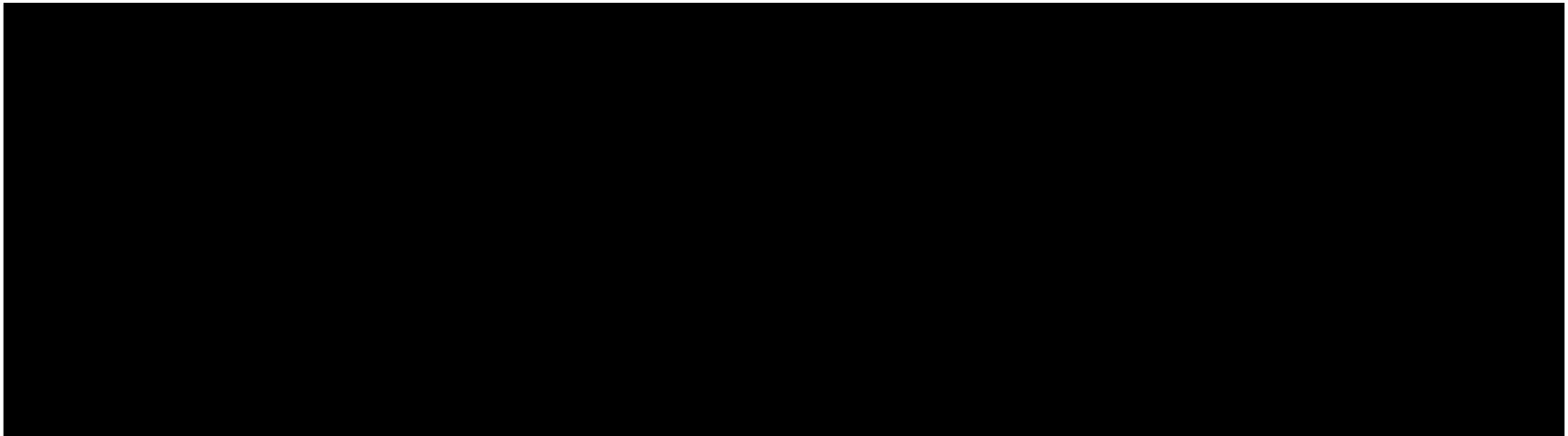
80%

//Assumption of utilisation of forecourt space - artificially increases forecourt design volume for the purpose of calculating effective kerb length

7. Landside planning

Kerbside demand

Mode share consistent from work undertaken in relation to Auckland Airport and refined in Phase 2. No change in mode share accounted for.



7. Landside planning

Kerbside demand

Dwell time sourced from surveys at comparator airports and adapted for future planning. Will require management at the kerb consistent with growing airports.

DWELL TIME

Mode	Existing	Proposed
	<i>Melbourne Airport</i>	
	<i>min</i>	<i>min</i>
Car: Drop-off	2.1	2.0
Car: Pick-up	2.5	2.5
Taxi: Drop-off	2.1	2.0
Taxi: Pick-up	2.6	2.5
Rideshare: Drop-off	2.1	2.0
Rideshare: Pick-up	2.6	2.5
Commercial and pre-booked: Drop-off	N/A	10.0
Commercial and pre-booked: Pick-up	N/A	10.0
Super Shuttle	N/A	5.0

7. Landside planning

Kerbside demand

Occupancy of vehicles assumed from data and experience at comparator airports.

OCCUPANCY

Mode	Occupancy (Drop-off)	Occupancy (Pick-up)
	<i>pax</i>	<i>pax</i>
Super Shuttle	5.0	5.0
Mode	Occupancy (Drop-off and Pick-up)	
	DOM+REG	INT
	<i>pax</i>	<i>pax</i>
Car	1.25	1.65
Taxi / Rideshare	1.30	1.65

7. Landside planning

Kerbside demand

Bus timetables were checked from existing sources. It is proposed that AirportLink, Inter-terminal transfer bus and Park and Ride parking buses will increase frequency over time.

BUS TIMETABLE

Bus Type	Frequency (min)		Bus Stops	
	Existing	Proposed	Existing	Proposed
AT Airport Link	10	5	1	Calc
AT Route 38	15	15	0	Calc
Skydrive	30	30	1	1
Intercity	60	60	1	0
Transfer Bus (Inter-terminal)	10	5	0	Calc
Yellow Hotel Ibis	30	30	0	0
Park & Ride Bus 1 (CP)	10	5	1	Calc
Park & Ride Bus 2	N/A	N/A	0	0
Coaches	N/A	N/A	1	0

7. Landside planning

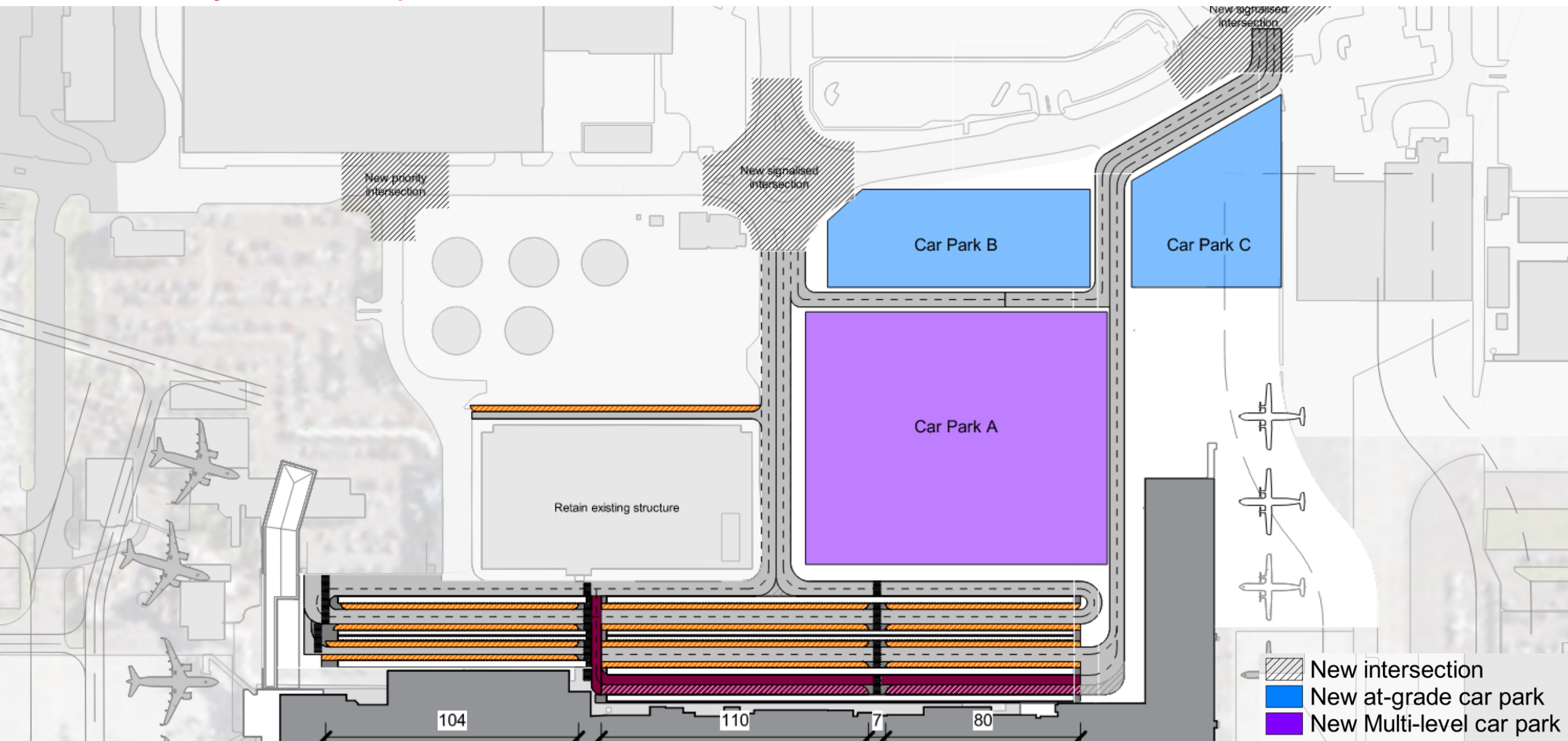
Kerbside demand

A 2043 design year kerbside demand requirement is shown in the table below, split between Domestic and Regional sectors. Kerbside vehicle and length requirements include kerbside modes excluding bus

Sector	Kerbside Pax Demand (pax/h)	Kerbside Veh Demand (veh/h)*	Kerbside Length Required (m)*
Domestic	1,950	1,350	900
Regional	500	350	250
Combined	2,450	1,700	1,150

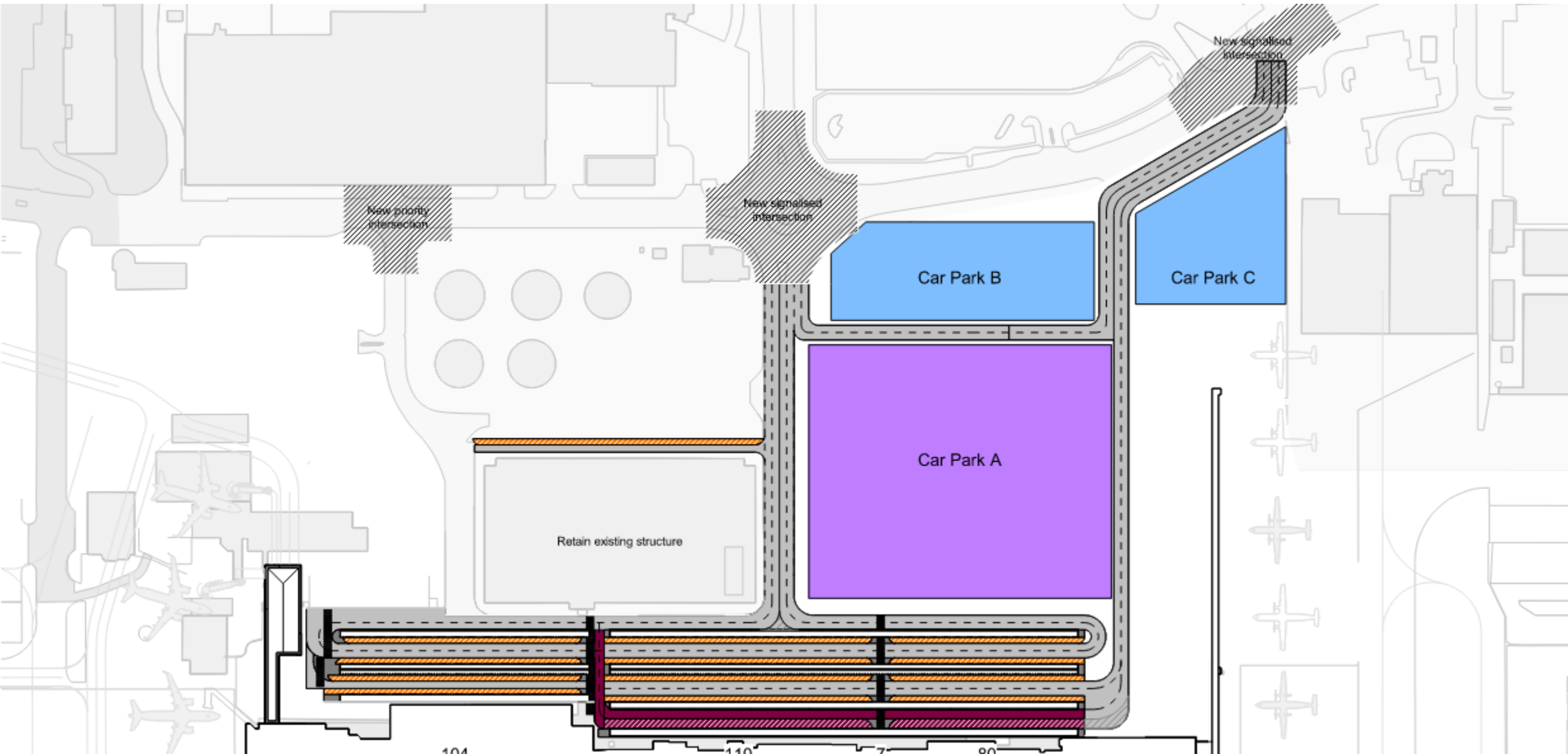
7. Landside planning

Landside layout - Eastern expansion



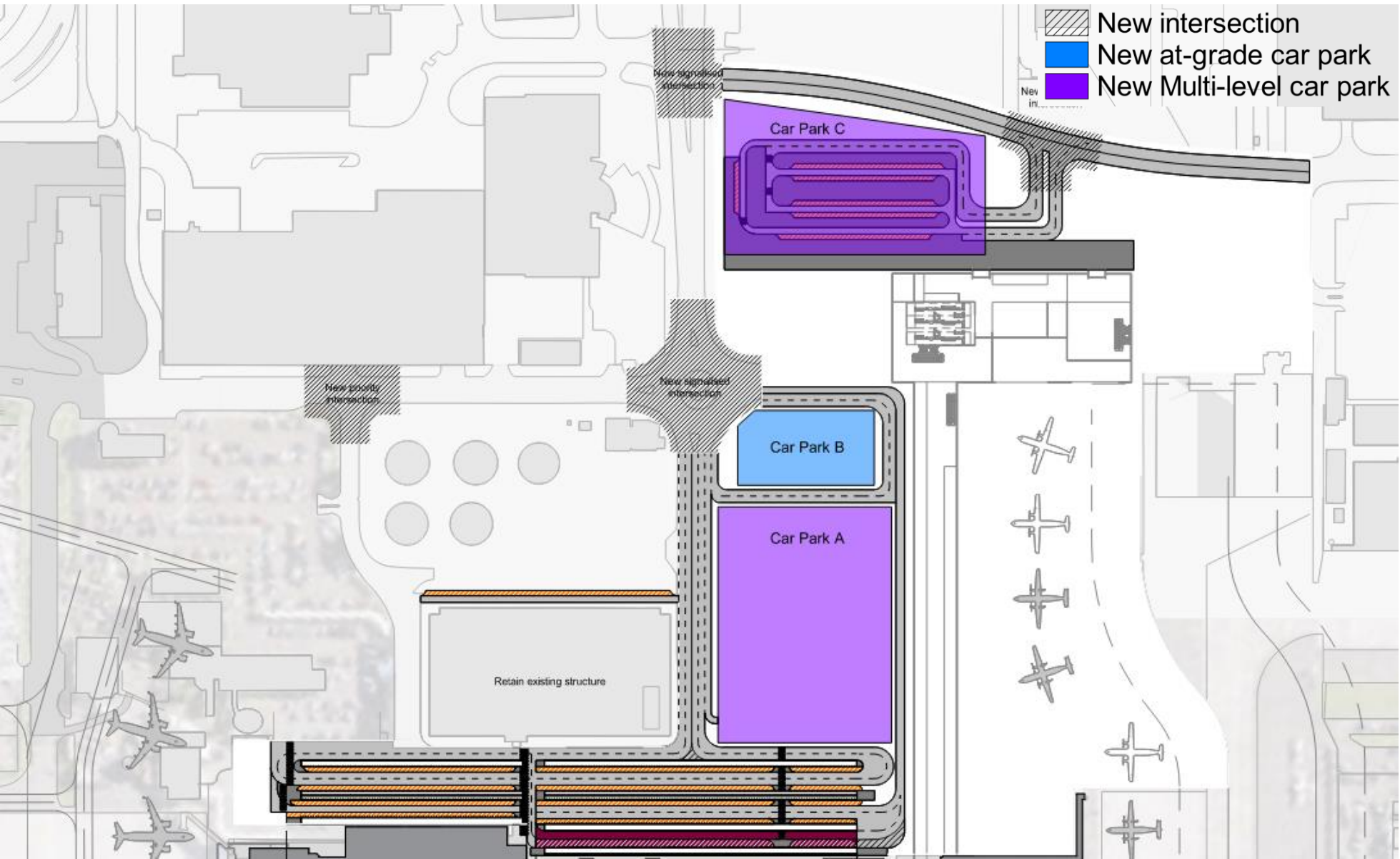
7. Landside planning

Landside layout - DTB plus Pier A1



7. Landside planning

Landside layout - Regional Headhouse



8. Staging

Methodology

The airside, terminal and landside planning elements were investigated to understand how they could be staged over the 20 year development period.

Three delivery periods were assumed as part of the development of staging.

Immediate: 2023 - 2028

Medium term: 2028 - 2038

Long term: 2038 - 2043

Staging plans were developed comparing the airside, terminal and landside infrastructure against requirements, specifically:

- Overnight stand estimates by design year.
- Programme of Requirements model outputs by design year.
- Kerbside Estimation Model outputs by design year.

Initial staging plans were presented during Workshop 2 to Air New Zealand showing how the airside, terminal and landside infrastructure could be phased over the 20 year development period. This included investigating multiple staging plans for a single option.

Key inputs into the staging plans included the identification of regret infrastructure development (and therefore regret spend). This was identified by Air New Zealand squads as an element that needed further consideration as part of the feedback from Phase 2.

Comments from the Workshop 2 have been integrated into the staging plans and provided to the cost consultant to enable escalation in costs to be considered and projected over the 20 year timeframe.

8. Staging

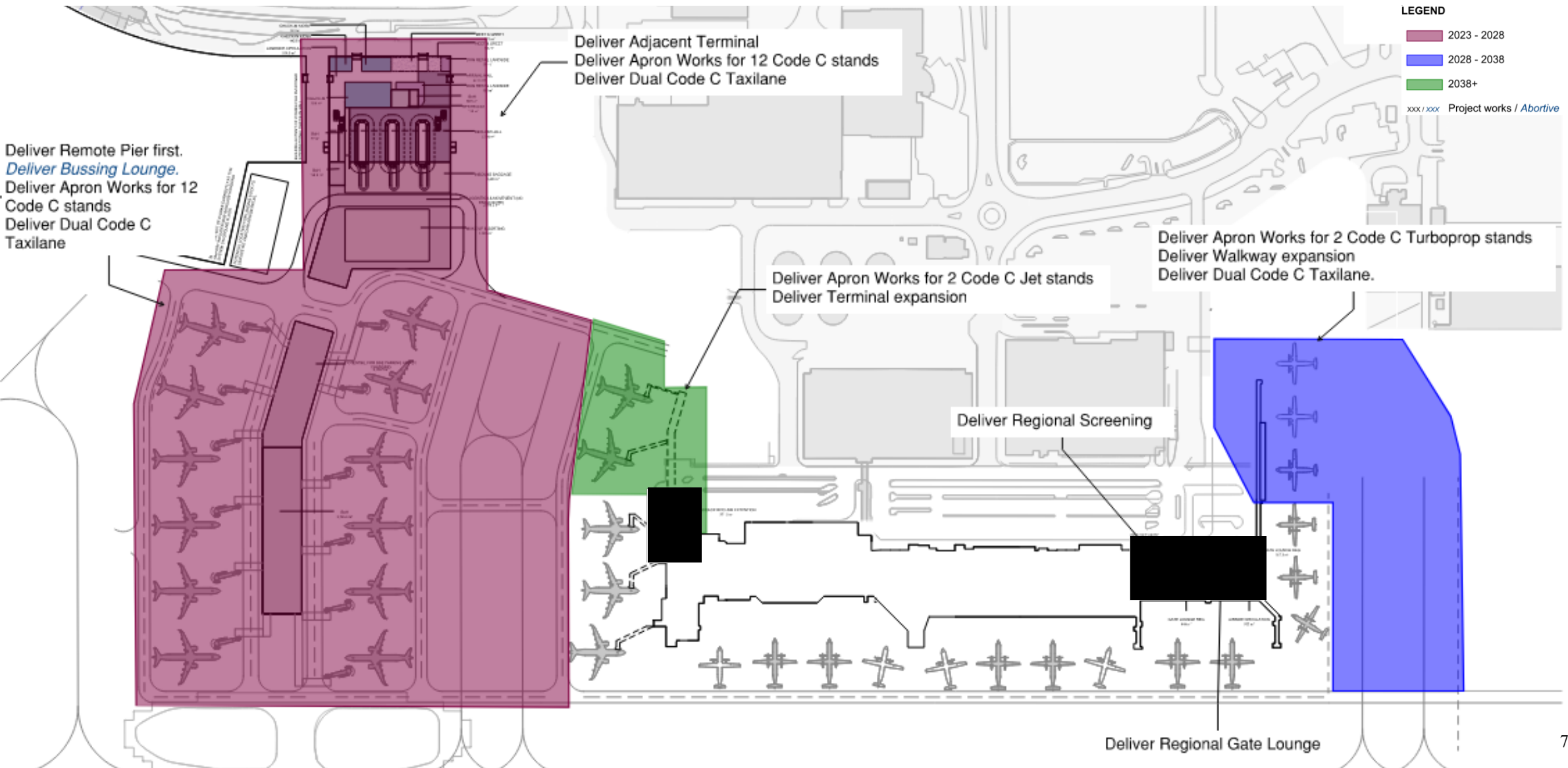
Key findings

Key findings from the development of the staging:

- Two staging plans were developed for the Adjacent Domestic Terminal option. This included an option with the early development of the Adjacent Domestic Terminal processor and an option with the initial delivery of a remote Pier A1 prior to the construction of the processor. An immediate delivery of the terminal processor was agreed as the basis for cost estimation as the remote arrangement is captured in considerations for the other options.
- It was found there was only one pathway for the staging of the Eastern expansion and DTB plus Pier A1 options. A remote Pier A1 is required early to accommodate the overnight stand requirements for Code C jets assuming realignment of Taxiway Bravo. The DTB also needs to be re-configured early to accommodate for Regional security and baggage upgrades.
- Two staging plans were developed for the Regional Headhouse option. This included an option with the early development of the Regional Headhouse and associate road, kerbside and parking infrastructure. A second option was to delay the delivery of the Regional Headhouse, however, this resulted in the need to deliver regret infrastructure in the DTB to provide regional screening and growth. Accordingly it was agreed to not take the second option forward for costing.

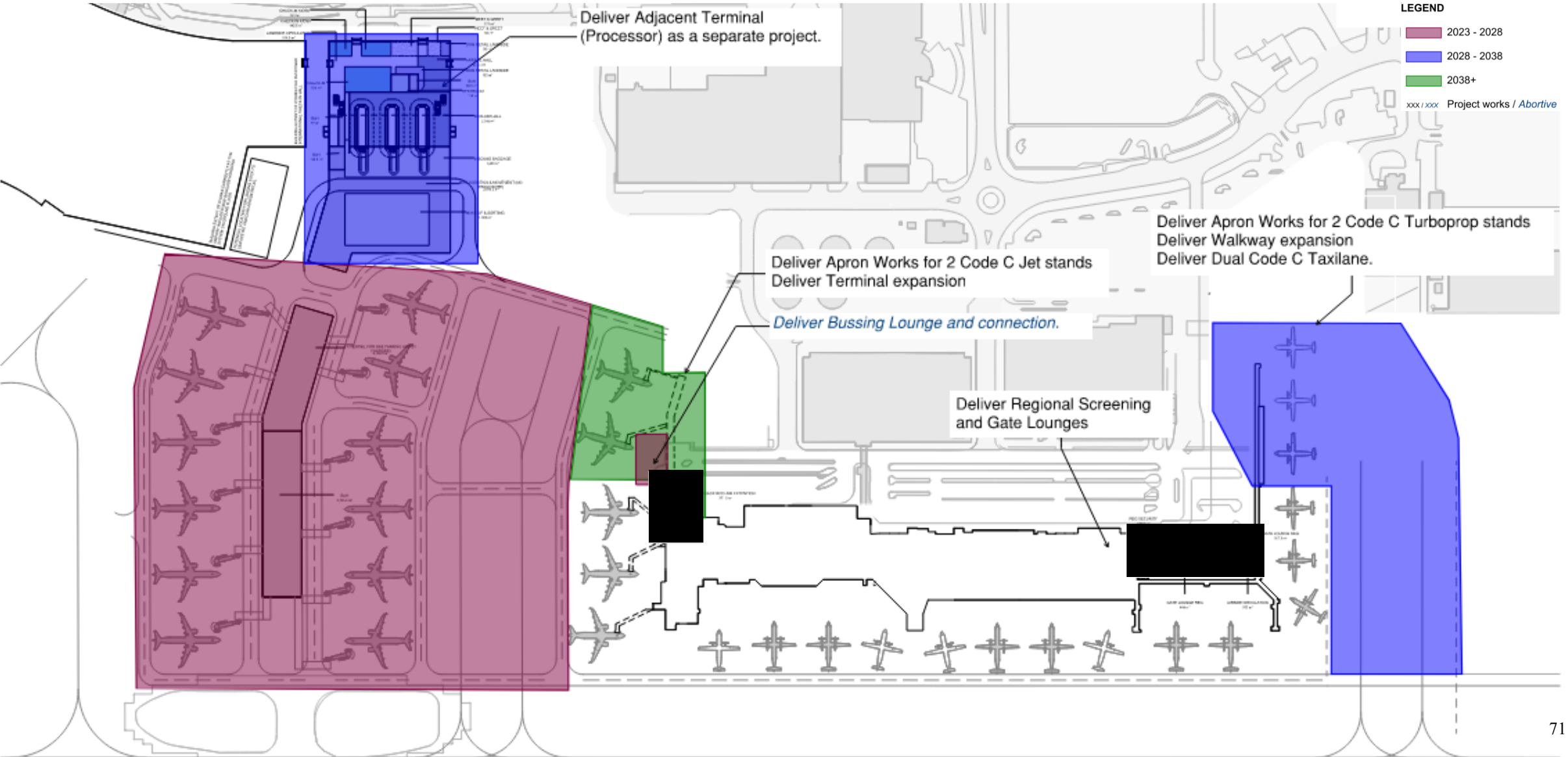
8. Staging

Domestic Adjacent Terminal - Staging Pathway A (Deliver immediately)



8. Staging

Domestic Adjacent Terminal - Staging Pathway B (Deliver Remote Pier first)



8. Staging

Eastern expansion - Staging Pathway A (Deliver immediately)

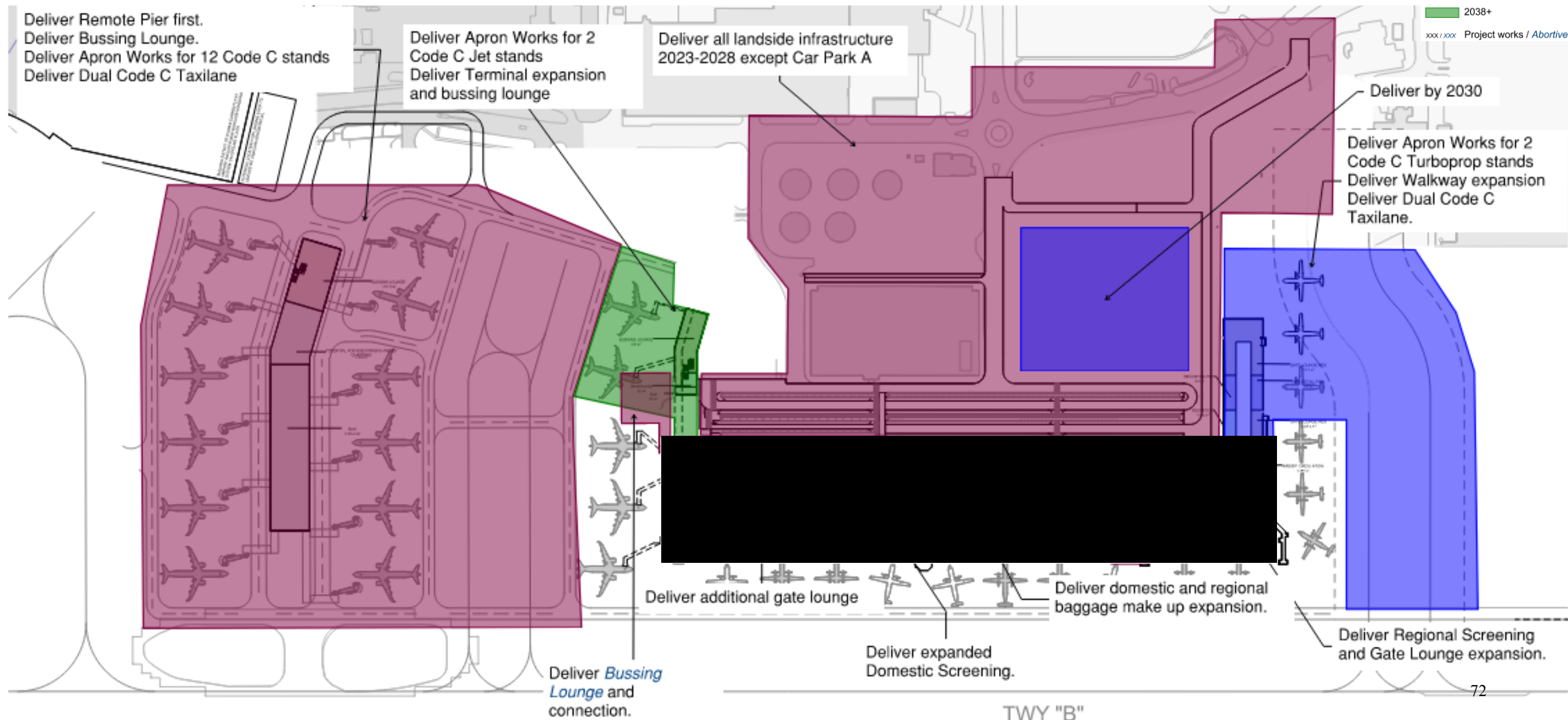
LEGEND

2023 - 2028

2028 - 2038

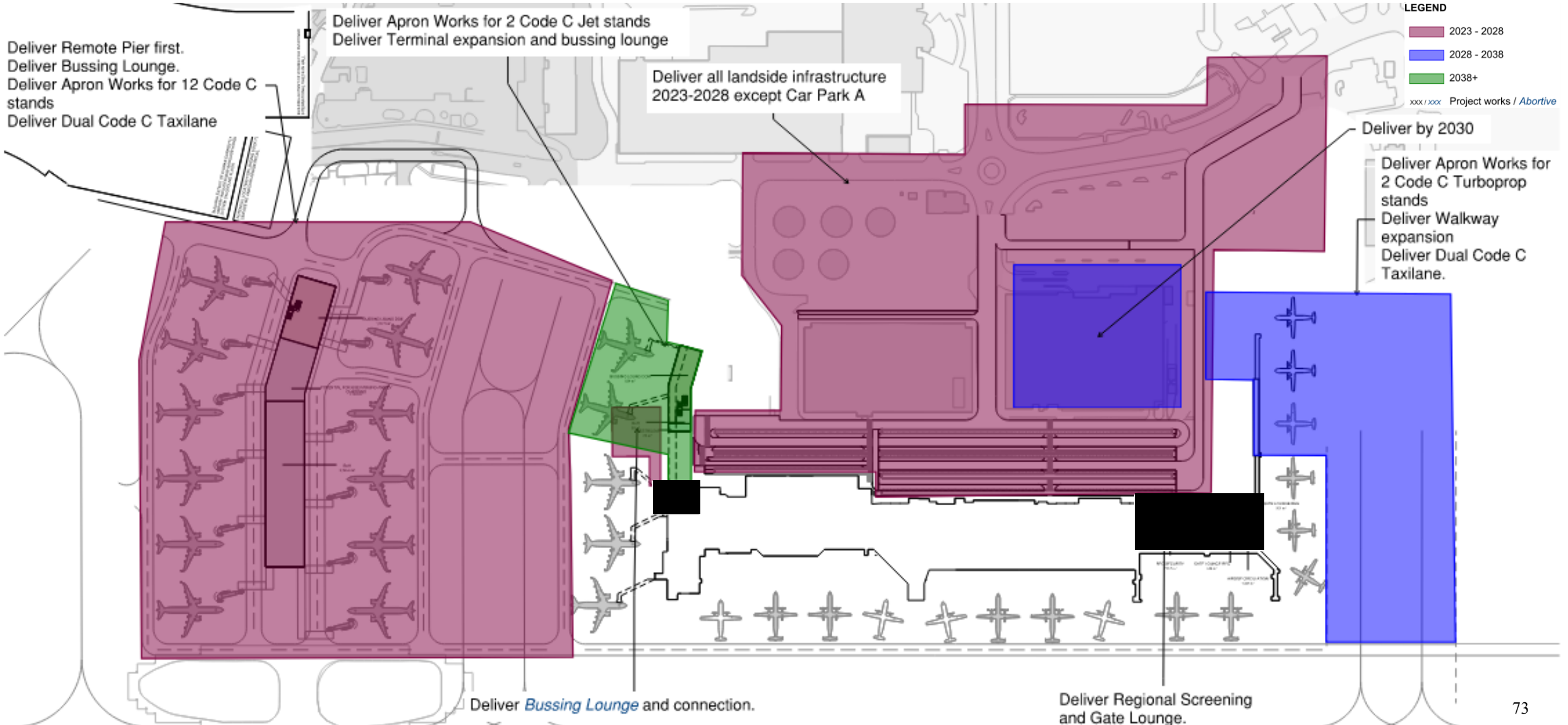
2038+

xxx/xxx Project works / Abortive



8. Staging

DTB plus Pier A1 - Staging Pathway A (Deliver immediately)



8. Staging

Regional Headhouse - Staging Pathway A (Deliver immediately)

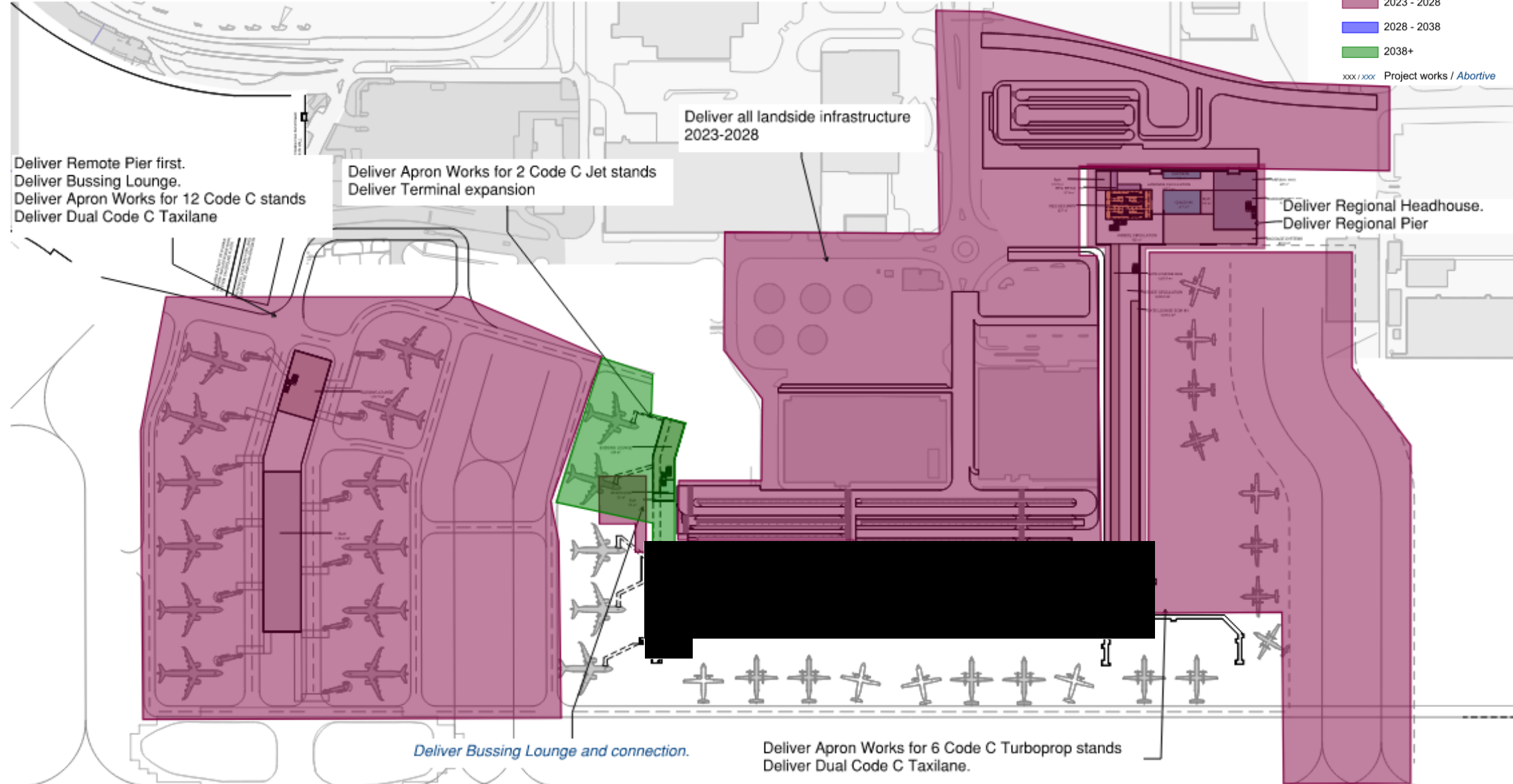
LEGEND

2023 - 2028

2028 - 2038

2038+

xxx / xxx Project works / Abortive

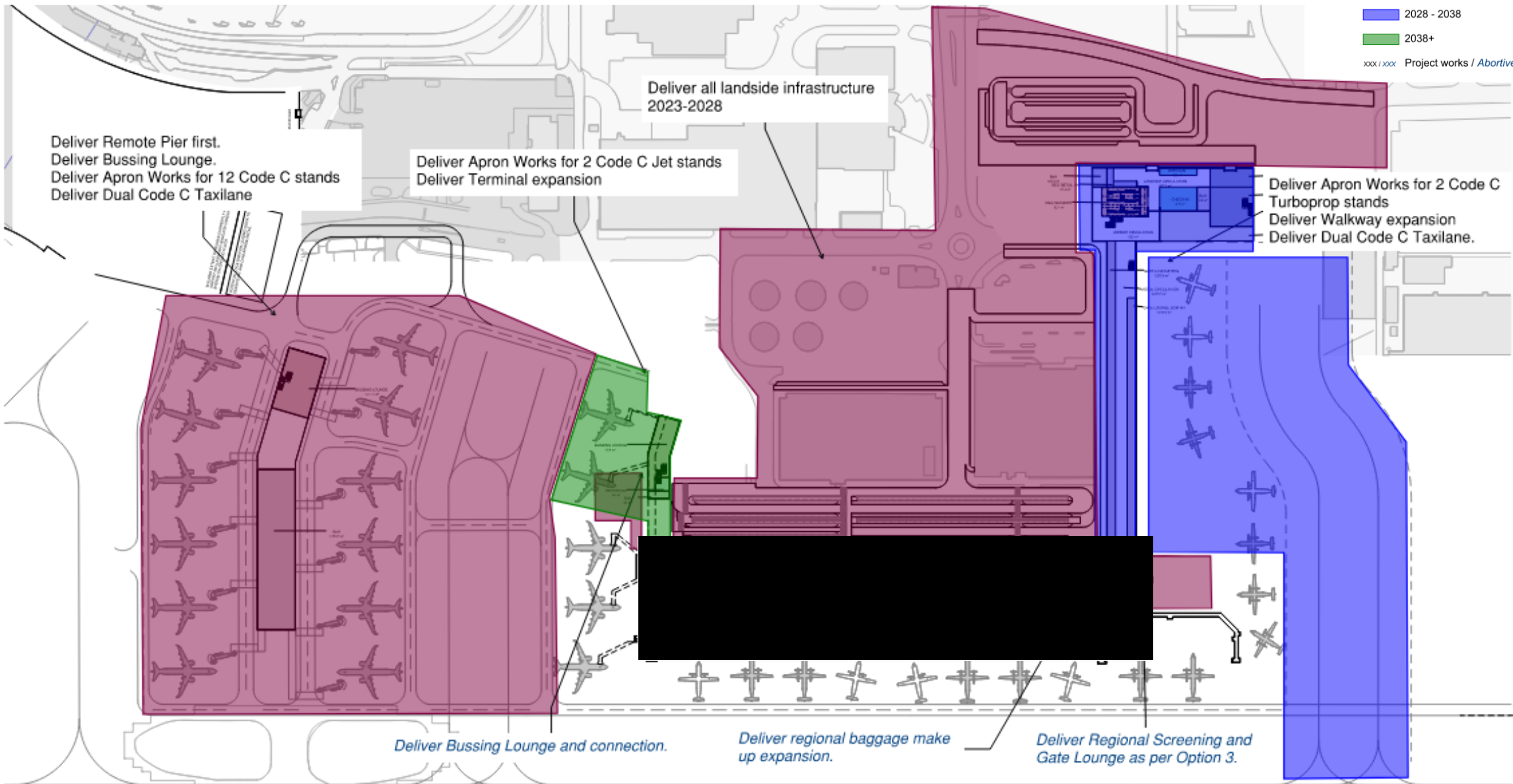


8. Staging

Regional Headhouse - Staging Pathway B (Deliver DTB upgrades first)

LEGEND

- 2023 - 2028
- 2028 - 2038
- 2038+
- xxx / xxx Project works / *Abortive*



9. Costing

Methodology

A P50 cost plan for each option has been prepared with pricing of the functional areas indicated on the airside, terminal and landside plans. Where possible, costs have been benchmarked by cost data from recently completed airport developments in the Australasia region.

The costs for each option include the following cost provisions:

- Resource and Building Consents 2%
- Professional Fees 15%
- AIAL Management Costs 3.8%
- Design and construction contingency 25%

All costs include escalation to the mid-point of the construction period at a rate of 4% for the 2023-24 period and 2.5% per annum thereafter.

The costs have been further broken down into the following development programme dates as identified in the staging plans:

- 2023 - 2028
- 2028 - 2038
- 2038+

The main exclusions are noted below:

1. GST
2. Financing costs
3. Land purchases if required
4. Legal costs
5. Tenant disruption costs
6. Costs associated with the loss of amenity
7. Insurances
8. Operational costs, such as bussing.

The costs were categorised into the following groups and are explained in the following slide.

- Group 1 projects for direct comparison against AIAL's reported \$2.2b NZD cost estimate to deliver the IDT.
- Group 2 projects excluded from the AIAL's reported \$2.2b NZD cost estimate to deliver the IDT.

9. Costing

Key findings

Key findings from the cost estimation of the four shortlisted options:

- All options were priced to include construction related costs, risks and escalation to a P50 level of confidence. All cost estimates detailed below include escalation.
- The cost estimate was provided in two groups to reflect a split of comparable and incomparable costs to the to the AIAL IDT proposal. Group 1 costs included comparable costs such as the construction of the Adjacent Domestic Terminal or remote pier and Domestic capacity upgrades in other options. Group 2 costs included incomparable costs such as such as the relocation of the existing traffic control tower and upgrades to the existing DTB to maintain operations for the next 20 years
- The Regional Headhouse option is the most expensive, with a total option escalated cost of \$2.7bn. The Eastern expansion and DTB plus Pier A1 options are the next most expensive with total option escalated costs of \$2.4bn each.
- The Adjacent Domestic Terminal option is the least expensive option with a total option escalated cost of \$2.0bn.
- The Adjacent Domestic Terminal option was found to be the least expensive option, as landside car parking, road and kerbside infrastructure is already being provided as part of AIAL's Ground Transport Hub. It has the highest amount of comparable cost to the AIAL IDT at \$1.2bn owing to the construction of the new processor and pier. However, these costs are almost half of the reported cost of the AIAL IDT option.
- The Eastern expansion and DTB plus Pier A1 options have a similar total option cost. Both options have similar Group 1 (comparable) costs at \$0.8-\$0.9bn and Group 2 (incomparable) costs at \$1.55bn, with a minor increase for the Eastern expansion option owing to the additional infrastructure delivered in the DTB.
- The Regional Headhouse option is the most expensive owing to a significant new build of terminal infrastructure (the Regional Headhouse) and the most expensive landside infrastructure cost.
- The Eastern expansion, DTB plus Pier A1 and Regional Headhouse options have incomparable costs of over \$1.5bn owing to the need to invest more in the DTB, whereas the Adjacent Domestic Terminal has incomparable costs of under \$900m.

9. Costing

Cost estimate: Grouping and line items

Cost estimates for individual projects were combined into line items to reflect the type of infrastructure being delivered. These splits are outlined in the table below. These estimate items are collated into two groups. The groupings provide line items that are either “comparable” or “incomparable” when considering AIAL’s reported estimate for the Integrated Domestic Terminal at \$2.2bn NZD.

Estimate item	Description
Group 1 - Comparable costs included in the AIAL IDT estimate	
Terminal - Adjacent Domestic Terminal / Remote Pier	New terminal related infrastructure related to the new ADT and/or Remote Pier. Includes infrastructure such as terminal space, terminal fitout, security, check-in, reclaim, aerobridges, gate lounge, bus lounge, bridge to bus lounge, BOH, restrooms, staff accommodations etc.
Terminal - Domestic Terminal upgrades	New and altered terminal related infrastructure related to the increase in capacity of Domestic services. Includes infrastructure such as terminal space, terminal fitout, security, check-in, reclaim, aerobridges, gate lounge, bus lounge, bridge to bus lounge, BOH, restrooms, staff accommodations etc.
Airside - Airside infrastructure	Aviation related infrastructure excluding pavement and fuel. Includes infrastructure such as GSE and other airside systems.
Airside - Pavement and Fuelling (Domestic)	Pavement rebuild and fuel infrastructure on the west side of the terminal (DTB<>Remote Pier). Includes infrastructure such as pavement, fuel services and hydrants
Group 2 - Comparable costs included in the AIAL IDT estimate	
Terminal - Domestic Terminal Building Maintenance	Terminal related infrastructure, related to the upkeep of the building or non-terminal capacity elements of the building.
Terminal - Regional Capacity Upgrades	Terminal related infrastructure related to the increase in capacity of Regional services. Includes infrastructure such as terminal space, terminal fitout, security, check-in, reclaim, aerobridges, gate lounge, bus lounge, bridge to bus lounge, BOH, restrooms, staff accommodations etc.
Airside - Pavement and Fuelling (Regional)	Pavement rebuild and fuel infrastructure on the east side of the terminal. Includes infrastructure such as pavement, fuel services and hydrants.
Landside - Kerbside, road and forecourt infrastructure	Demolition and replacement of the traffic infrastructure. Includes roadworks, intersection works, forecourt, kerbs and car park structures.
Landside - Control Tower	Demolition and replacement of the air traffic control tower.

9. Costing

Cost estimate: Group 1 - Comparable costs

The cost estimate elements below show the escalated P50 *comparable costs* of delivering the shortlisted options to the AIAL IDT proposal.

The costs below include new build domestic terminal infrastructure, new DTB infrastructure, fitout, aviation infrastructure and pavement between the DTB and ADT/Remote Pier A1.

Estimate items (Group 1 - Comparable costs)	Adjacent Domestic Terminal		Eastern expansion		DTB plus Pier A1		Regional Headhouse	
	Estimate (\$NZD)	Escalation period	Estimate (\$NZD)	Escalation period	Estimate (\$NZD)	Escalation period	Estimate (\$NZD)	Escalation period
Terminal - Adjacent Domestic Terminal / Remote Pier	\$792,000,000	2023-2028	\$342,000,000	2023-2028	\$342,000,000	2023-2028	\$342,000,000	2023-2028
Terminal - Domestic terminal upgrades	\$73,000,000	2023-2028	\$233,000,000	2023-2038+	\$181,000,000	2023-2038+	\$106,000,000	2023-2038
Airside - Airside infrastructure	\$9,000,000	2023-2028	\$5,000,000	2023-2028	\$5,000,000	2023-2028	\$5,000,000	2023-2028
Airside - Pavement and Fuelling (Domestic)	\$313,000,000	2023-2028	\$313,000,000	2023-2028	\$313,000,000	2023-2028	\$313,000,000	2023-2028
Total escalated costs for Group 1	\$1,187,000,000		\$893,000,000		\$841,000,000		\$766,000,000	

9. Costing

Cost estimate: Group 2 - Incomparable costs

The cost estimate elements below show the escalated P50 *incomparable costs* of delivering the shortlisted options to the AIAL IDT proposal.

The costs below include internal repairs to the DTB, airside pavement for the dual Code C taxiway east of the DTB, landside infrastructure including forecourt, new car parking and the replacement of the air traffic control tower.

Estimate items (Group 2 - Incomparable costs)	Adjacent Domestic Terminal		Eastern expansion		DTB plus Pier A1		Regional Headhouse	
	Estimate (\$NZD)	Escalation period	Estimate (\$NZD)	Escalation period	Estimate (\$NZD)	Escalation period	Estimate (\$NZD)	Escalation period
Terminal - Domestic Terminal Building Maintenance	\$70,000,000	2023-2038+	\$51,000,000	2023-2038+	\$56,000,000	2023-2038+	\$67,000,000	2023-2038+
Terminal - Regional Capacity Upgrades	\$132,000,000	2023-2028 2038+	\$282,000,000	2028-2038+	\$293,000,000	2023-2038+	\$554,000,000	2023-2038+
Airside - Pavement and Fuelling (Regional)	\$250,000,000	2038+	\$250,000,000	2038+	\$250,000,000	2038+	\$250,000,000	2038+
Landside - Kerbside, road and forecourt infrastructure	\$0	N/A	\$554,000,000	2023-2038+	\$554,000,000	2023-2038+	\$670,000,000	2023-2038
Landside - Control Tower	\$400,000,000	2038+	\$400,000,000	2038+	\$400,000,000	2038+	\$400,000,000	2038+
Total escalated costs for Group 2	\$852,000,000		\$1,537,000,000		\$1,553,000,000		\$1,941,000,000	

9. Costing

Cost estimate: Total estimate

Total P50 estimate for each option is outlined below, including both comparable and incomparable costs.

A breakdown of the individual costs are provided in Appendix B.

Estimate Groups	Adjacent Domestic Terminal	Eastern expansion	DTB plus Pier A1	Regional Headhouse
	Estimate (\$NZD)	Estimate (\$NZD)	Estimate (\$NZD)	Estimate (\$NZD)
Group 1 - Comparable costs	\$1,187,000,000	\$893,000,000	\$841,000,000	\$766,000,000
Group 2 - Incomparable costs	\$852,000,000	\$1,537,000,000	\$1,553,000,000	\$1,941,000,000
Total option cost	\$2,039,000,000	\$2,430,000,000	\$2,394,000,000	\$2,707,000,000

10. Evaluation

Methodology

An evaluation was undertaken using the design, assessment and cost estimation produced during Phase 3. All shortlisted options were assessed against the IDT option.

1. Adjacent Domestic Terminal.
2. East expansion.
3. Domestic Terminal Building plus Pier A1.
4. Regional Headhouse.

The evaluation framework from Phase 2 was retained to ensure consistency for the scoring of options through the long- and short-listing process. The scoring of the long list is through a Red, Amber, Green (RAG) scoring, as follows:

1	2	3	4	5	x
Worst	Worse	Average	Better	Best	Show-stopper

Key questions that form the basis of the assessment are shown overleaf, and include the following categories:

- Landside
- Terminal
- Airside
- Passenger Experience
- Runway
- Feasibility
- Operational Impact
- Affordability

Affordability was separated out from the final scoring to show how the other elements of the evaluation compared to the affordability of the option.

The evaluation progressed with an initial scoring at Workshop 1, with the group evaluation session undertaken during Workshop 2.

10. Evaluation

Key findings

The findings from the evaluation are outlined below.

The Adjacent Domestic Terminal option was found to be the best scoring option and emerged as the preferred option during the evaluation process.

- The option provides a similar outcome to the IDT with the best airside and terminal related outcomes relative to the other shortlisted options.
- It also provides a better passenger experience and operational impact (no need for bussing or baggage transfer) relative to the other shortlisted options.
- Whilst it has the highest comparable cost of \$1.19bn when compared to AIAL's IDT cost of \$2.2bn NZD cost estimate, it is still approximately \$1bn less expensive. Overall, it is also the least expensive option at an estimated \$2.04bn NZD.

The Regional Headhouse option was found to be the next best performing option. However, it scored worse than the Adjacent Domestic Terminal option (and the IDT) for a number of reasons.

- The option scores less well for passenger experience and operational impact owing to remote Pier A1, the need for bussing and baggage transfer as well as the distance between the new Regional Headhouse and furthest regional stand to other stands resulting in higher MCTs.
- It is the most expensive option at an estimated total option cost of \$2.7bn NZD.

The Eastern expansion and DTB plus Pier A1 options are the worst scoring of the shortlisted options.

- Both options provide a compromised landside outcome with the need to provide valet and premium facilities away from the terminal face.
- These options also score less well for passenger experience and operational impacts owing to remote Pier A1 and the need for bussing and baggage transfer
- The DTB plus Pier A1 has the lowest evaluation score alongside a total option cost at \$2.39bn NZD.

10. Evaluation

Evaluation metrics and indicators

Metric	Evaluation indicators
Landside	<p>Does the forecourt provide sufficient capacity to support this option?</p> <p>Is the Ground Transport Hub or new facility located sufficiently close to the terminal?</p> <p>What impact does the option have on the wider road network?</p>
Terminal	<p>Does the terminal provide sufficient capacity to accommodate passengers at IATA Optimum at 2043?</p> <p>Does the terminal provide appropriate baggage system capacity and operation?</p>
Airside	<p>Does the proposed option provide a sufficient number of contact stands?</p> <p>Does the option achieve appropriate taxilane and taxiway separation and clearances?</p>
Pax Experience	<p>Does the option provide an appropriate Int <> Dom, Dom <> Reg and Int <> Reg transfer experience?</p> <p>Is passenger wayfinding intuitive?</p>
Runway	<p>Can the option operate efficiently with the realigned taxiway and contingent runway?</p>
Feasibility	<p>Does the option align with the Master Plan?</p> <p>Can this option be delivered without impacting on other uses (airside, roading network/forecourt, JUHI, hangars).</p> <p>How flexible is the staging of the construction of the option?</p> <p>What extent of regret development is there with each option?</p>
Operational Impact	<p>Can this option deliver a full future flight schedule?</p> <p>To what extent are additional operational processes required (including bussing)?</p>
Affordability	<p>What level of CAPEX and OPEX is required to deliver this option? (high score = lower cost)</p>

10. Evaluation

Evaluation - Landside

The Adjacent Domestic Terminal option limits the need for construction of additional landside facilities and is proximate to Ground Transport Hub.

Option	Evaluation	Score
Adjacent Domestic Terminal	Landside provision assumed appropriate as the option is Master Plan aligned. Located proximate to the Ground Transport Hub and providing easy access to Valet facilities. Minimises the impact on the wider road network as aligns with the loop principle of the Master Plan.	5
Eastern expansion	Forecourt kerbside re-developed to provide appropriate kerbside space for 2043 demand. Not proximate to new Ground Transport Hub. Valet to be re-provided in new parking facility and requires crossing of forecourt lanes. Long-term risk with the capacity of the wider road network to accommodate traffic demand, particularly at Tom Pearce / George Bolt intersection.	2
DTB + Pier A1	Forecourt kerbside re-developed to provide appropriate kerbside space for 2043 demand. Not proximate to new Ground Transport Hub. Valet to be re-provided in new parking facility and require crossing of forecourt lanes. Long-term risk with the capacity of the wider road network to accommodate traffic demand, particularly at Tom Pearce / George Bolt intersection.	2
Regional Headhouse	Forecourt kerbside re-developed at DTB and new forecourt area provided for regional passengers sized for 2043 demand. Separates key modes and requires additional stops for buses / shuttles. Not proximate to new Ground Transport Hub. Valet to be re-provided in new parking facility proximate to regional headhouse. Long-term risk with the capacity of the wider road network to accommodate traffic demand, particularly at Tom Pearce / George Bolt intersection.	3
Integrated Domestic Terminal (AIAL endorsed)	Opposite new Ground Transport centre, provides additional forecourt capacity.	5

10. Evaluation

Evaluation - Terminal

Most options deliver appropriate terminal space to operate at 2043. The DTB plus Pier A1 option provides the least additional capacity.

Option	Evaluation	Score
Adjacent Domestic Terminal	New processor in Adjacent Terminal sized for appropriate number of domestic passengers. Existing DTB reconfigured for regional and partial domestic. Adequate space for BHS operations.	5
Eastern expansion	Re-configured processor in DTB sized for appropriate number of domestic passengers in 2043. Increases the size of the processor: including regional and domestic security, increased gate lounge space and baggage make-up. BHS space limited and requires multiple handling areas, potential to provide elsewhere.	4
DTB + Pier A1	Re-configured processor in DTB does not provide sufficient capacity for 2043. Additional regional security and gate lounge provided. Limited terminal processor capacity. Requires bussing lounge in DTB. Inadequate space for baggage handling and would potentially require BHS infrastructure in remote pier.	2
Regional Headhouse	Combination of re-configured DTB and new Regional Headhouse provides for appropriate number of passengers in 2043. Baggage area and infrastructure appropriate to future years. Adequate space for BHS operations.	5
Integrated Domestic Terminal (AIAL endorsed)	New processor sized for appropriate number of domestic passengers	5

10. Evaluation

Evaluation - Airside

All options provide for requisite stand capacity to 2043 with all sized appropriately including taxi lane improvements.

Option	Evaluation	Score
Adjacent Domestic Terminal	Can provide the appropriate number of stands assuming DTB remains.	4
Eastern expansion	Can provide the appropriate number of stands assuming DTB remains.	4
DTB + Pier A1	Can provide the appropriate number of stands assuming DTB remains.	4
Regional Headhouse	Can provide the appropriate number of stands assuming DTB remains. Provides additional expansion for regional relative to other new options.	5
Integrated Domestic Terminal (AIAL endorsed)	Can provide the appropriate number of stands assuming DTB remains. Provides additional expansion for regional relative to other new options.	4

10. Evaluation

Evaluation - Passenger experience

The Adjacent Domestic Terminal option provides improvement in MCT for International \leftrightarrow Domestic transfer with easier wayfinding. Other options require increased MCTs as well as additional steps in the passenger journey, such as bussing.

Option	Evaluation	Score
Adjacent Domestic Terminal	Improved Int \leftrightarrow Dom experience with a significant reduction in MCT relative to existing. No requirement for remote stand access. Dom \leftrightarrow Reg results in an increase in MCT with most Domestic aircraft at the ATB. Minor wayfinding challenges with DOM located in both DTB and ATB.	4
Eastern expansion	Poor Int \leftrightarrow Dom-Reg experience with increased MCT for most connections. Requires bussing for most Domestic passengers. Dom \leftrightarrow Reg experience impacted due to bussing from Remote Pier. Wayfinding more direct with a single point of access through the DTB.	2
DTB + Pier A1	Poor Int \leftrightarrow Dom-Reg experience with increased MCT for most connections. Requires bussing for most Domestic passengers. Dom \leftrightarrow Reg experience impacted due to bussing from Remote Pier. Wayfinding more direct with a single point of access through the DTB.	2
Regional Headhouse	Poor Int \leftrightarrow Dom-Reg experience with increased MCT for most connections. Requires bussing for most Domestic passengers. More intuitive wayfinding when all regional passengers are processed in one headhouse. Wayfinding more direct on departures with passengers moving to 3 separate terminals. Potentially more complex on arrival.	2
Integrated Domestic Terminal (AIAL endorsed)	Improved Int \leftrightarrow Dom experience with a significant reduction in MCT relative to existing. No requirement for remote stand access. Dom \leftrightarrow Reg results in an increase in MCT with most Domestic aircraft at the ATB. Some wayfinding challenges with DOM located in both DTB and ATB.	4

10. Evaluation

Evaluation - Runway

All options can operate in a similar manner with Twy Bravo and contingent runway coming online. The Eastern expansion and Regional Headhouse options provide additional turboprop stands away from Twy Bravo.

Option	Evaluation	Score
Adjacent Domestic Terminal	Impacted by re-alignment of Twy Bravo. Requires delivery of Pier A1 by 2028 to mitigate impacts.	3
Eastern expansion	Impacted by re-alignment of Twy Bravo. Requires delivery of Pier A1 by 2028 to mitigate impacts. Additional turboprop stands to the east minimise need for pushback onto active taxiway.	4
DTB + Pier A1	Impacted by re-alignment of Twy Bravo. Requires delivery of Pier A1 by 2028 to mitigate impacts.	3
Regional Headhouse	Impacted by re-alignment of Twy Bravo. Requires delivery of Pier A1 by 2028 to mitigate impacts. Additional turboprop stands to the east minimise need for pushback onto active taxiway.	4
Integrated Domestic Terminal (AIAL endorsed)	Impacted by re-alignment of Twy Bravo. Requires delivery of Pier A1 by 2028 to mitigate impacts.	3

10. Evaluation

Evaluation - Feasibility

The Adjacent Domestic Terminal option limits regret development and can be staged. Other options impacted by regret development, lack of staging potential or have significant landside impacts.

Option	Evaluation	Score
Adjacent Domestic Terminal	Master Plan aligned but with revised pier configuration. Minor to no regret development with construction of ADT and pier by 2028. Option to deliver Remote A1 Pier first. No landside development required, assumes GTP provides necessary forecourt / parking requirements.	4
Eastern expansion	Not Master Plan aligned, but does not prevent the Master Plan being realised. Requires regret development in terms of upgrades within the DTB including east expansion, baggage and gate lounge space. No staging possible, all delivered by 2028. Requires redevelopment of forecourt and parking areas. Difficult to stage without loss of capacity.	2
DTB + Pier A1	Not Master Plan aligned, but does not prevent the Master Plan being realised. Limited regret development of upgrades within the DTB with only additional regional screening provided. Requires redevelopment of forecourt and parking areas. Difficult to stage without loss of capacity.	3
Regional Headhouse	Master Plan aligned. Limited regret development in terms of upgrades within the DTB. Minor to no regret development with delivery of regional headhouse by 2028. Option to deliver Remote A1 Pier first. Landside upgrades impact on access to DTB and car park areas. Impacts Laurence Stevens Drive. Impacts hangar.	3
Integrated Domestic Terminal (AIAL endorsed)	Master Plan aligned. Minor to no regret development with construction of ADT and pier by 2028. Option to deliver Remote A1 Pier first. No landside development required, assumes GTP provides necessary forecourt / parking requirements.	4

10. Evaluation

Evaluation - Operational impact

The Adjacent Domestic Terminal option delivers the most contact stands as well as dual Code C taxilanes. Other options impacted by need for a high capacity bussing solution.

Option	Evaluation	Score
Adjacent Domestic Terminal	Full schedule could be achieved. No bussing to remote stands required. Dual Code C taxilanes provides reduced delay for aircraft operations from pier (TBC).	5
Eastern expansion	Full schedule could be achieved. Significant bussing operation. May require increased block times or check-in/bag drop close off times to accommodate time required to transfer passengers to Pier A1. Impact on transfers through bussing. Dual Code C taxilanes provides reduced delay for aircraft operations from pier (TBC).	2
DTB + Pier A1	Full schedule could be achieved. Significant bussing operation. May require increased block times or check-in/bag drop close off times to accommodate time required to transfer passengers to Pier A1. Impact on transfers through bussing. Dual Code C taxilanes provides reduced delay for aircraft operations from pier (TBC).	1
Regional Headhouse	Full schedule could be achieved. Significant bussing operation. May require increased block times or check-in/bag drop close off times to accommodate time required to transfer passengers to Pier A1. Impact on transfers through bussing and additional stops for shuttles / buses. Dual Code C taxilanes provides reduced delay for aircraft operations from pier (TBC).	2
Integrated Domestic Terminal (AIAL endorsed)	Full schedule could be achieved. No bussing to remote stands required. Transfers can be managed as per existing conditions largely. Single Code C taxilanes provide risk of significant delay from stands on east side of pier and overall airfield.	3

10. Evaluation

Evaluation - Affordability

The Adjacent Domestic Terminal and Regional Headhouse options scored lower as they had a high Group 1 cost and high total option CAPEX cost respectively. The Eastern expansion and DTB plus Pier A1 costs were similar and both were less in Group 1 than the Adjacent Domestic Terminal and had a lower total option CAPEX cost when compared to the Regional Headhouse option.

Option	Evaluation	Score
Adjacent Domestic Terminal	Group 1 CAPEX costs: \$1.19b Group 2 CAPEX costs: \$852m Total option CAPEX costs: \$2.04b	2
Eastern expansion	Group 1 CAPEX costs: \$893m Group 2 CAPEX costs: \$1.54b Total option CAPEX costs: \$2.43b	3
DTB + Pier A1	Group 1 CAPEX costs: \$841m Group 2 CAPEX costs: \$1.55b Total option CAPEX costs: \$2.39b	3
Regional Headhouse	Group 1 CAPEX costs: \$766m Group 2 CAPEX costs: \$1.94b Total option CAPEX costs: \$2.71b	2
Integrated Domestic Terminal (AIAL endorsed)	CAPEX of \$2.200b assumed and is only comparable to the Group 1 CAPEX costs listed above. Considered unaffordable.	X

10. Evaluation

Evaluation - Summary

Summary shows the Adjacent Domestic Terminal as preferred through evaluation scoring and provides for a reduction in CAPEX of \$1b when compared to the AIAL's reported \$2.2b for the IDT (comparing Group 1 costs).

Option	Land	Ter	Air	Pax	Run	Feas	Op I	Score	CAPEX (Group 1)	CAPEX (Total)
Adjacent Domestic Terminal	5	5	4	4	3	4	5	30	\$1.19b	\$2.04b
Eastern expansion	2	4	4	2	4	2	2	20	\$893m	\$2.43b
DTB + Pier A1	2	2	4	2	3	3	1	17	\$841m	\$2.39b
Regional Headhouse	3	5	5	2	4	3	2	24	\$766m	\$2.71b
Integrated Domestic Terminal (AIAL endorsed)	5	5	4	4	3	4	3	28	\$2.2b	?

11. Conclusions

A summary of the conclusions arising from Phase 3 of the Affordable Pathways study are provided below:

Forecast review

- The DKMA DDFS overnight stand assessment showed a similar number of stands were required in 2018/19 and 2032/33 when compared to the Phase 2 approach for generating stand requirements, albeit with one additional Domestic jet stand required in 2033 (15 as compared to 14) when considering this additional dataset.

Aviation planning

- All four shortlisted options can accommodate the required number of Domestic and Regional stands alongside two dual Code C taxiways on the eastern and western sides of the DTB, including 15 jet stands in 2033.
- All four shortlisted options can be configured to futureproof for a permanently re-aligned Taxiway Bravo as a result of introduction of the Contingent Runway. This has meant that passenger boarding bridges on the southern edge of the DTB need to be removed and apron access roads be re-provided as a tail-of-stand roads.

Terminal design

- In the Adjacent Domestic Terminal option, the new processor provides for all functions, including check-in, at IATA Optimum with a potential transfer connection to the International Terminal. Some Domestic jet processing remains on the DTB but this could be for a Low Cost Carrier, as per current operations.
- The Eastern expansion option includes reconfiguration of the DTB including the incorporation of upgraded Regional and Domestic security. The baggage review by BNP noted that space was limited but workable.
- The DTB plus Pier A1 option provides the fewest terminal upgrades and will not achieve IATA Optimum in Level of Service or sufficient baggage capacity by 2043.
- The final option provides a Regional Headhouse which can accommodate all the necessary functions of a Regional processor. The baggage review by BNP noted that adequate space/capacity was provided for baggage handling facilities in the DTB and the new Regional Headhouse.

11. Conclusions

Terminal design (cont.)

- BNP noted that most options were workable in the provision of adequate space/capacity was provided for baggage handling facilities. Only the DTB plus Pier A1 option was unlikely to be able to provide appropriate levels of baggage infrastructure.
- The Adjacent Domestic Terminal is the only option to show an improvement in MCTs, for both Int>Dom and Dom>Int transfer passengers. This is the only improvement in MCT for all transfer journeys across all options.

Landside planning

- The required kerb length can be provided in the Eastern expansion, DTB plus Pier A1 and Regional Headhouse options. The Regional Headhouse option provides for a split of kerbside space between the Regional Headhouse and the DTB.
- No landside kerbside or car parking infrastructure was assumed to be required for the Adjacent Domestic Terminal option as it aligns with the Master Plan and the development of the Ground Transport Hub.

Staging

- There are only limited staging opportunities for all options. Two staging plans were developed for the Adjacent Domestic Terminal and Regional Headhouse options. It was agreed to move forward with early delivery of the processors for both options, rather than delaying and requiring regret spend in the DTB to provide short-term capacity.

Costing

- The Adjacent Domestic Terminal option has the highest amount of comparable cost to the AIAL IDT at \$1.2bn. However, these costs are almost half of the reported cost of the AIAL IDT itself. Overall, the Adjacent Domestic Terminal is also the least expensive option with a total option escalated cost of \$2.0bn.
- The Regional Headhouse option is the most expensive, with a total option escalated cost of \$2.7bn. The Eastern expansion and DTB plus Pier A1 options are the next most expensive with total option escalated costs of \$2.4bn each.
- All options include elements such as the relocation of the existing traffic control tower and upgrades to the existing DTB to maintain operations for the next twenty years.

11. Conclusions

Evaluation

The Adjacent Domestic Terminal emerged as the best scoring option and preferred option during the evaluation process.

- The option provides a similar outcome to the IDT with the best airside and terminal related outcomes relative to the other shortlisted options.
- It also provides a better passenger experience and operational impact (no need for bussing or baggage transfer) relative to the other shortlisted options.
- Whilst it has the highest comparable cost of \$1.19bn when compared to AIAL's IDT cost of \$2.2bn NZD cost estimate, it is still approximately \$1bn less expensive. Overall, it is also the least expensive option at an estimated \$2.04bn NZD.

The Regional Headhouse option was found to be the next best performing option. However, it scored worse than the Adjacent Domestic Terminal option (and the IDT) for a number of reasons.

- The option scores less well for passenger experience and operational impact owing to remote Pier A1, the need for bussing and baggage transfer as well as the distance between the new Regional Headhouse and furthest regional stand to other stands resulting in higher MCTs.
- It is the most expensive option at an escalated total option cost of \$2.7bn NZD.





The Eastern expansion and DTB plus Pier A1 options are the worst scoring of the shortlisted options.

- Both options provide a compromised landside outcome with the need to provide valet and premium facilities away from the terminal face. They also score less well for passenger experience and operational impact owing to remote Pier A1 and the need for bussing and baggage transfer.

12. Next Steps

Arup recommends the following next steps for this study are considered:

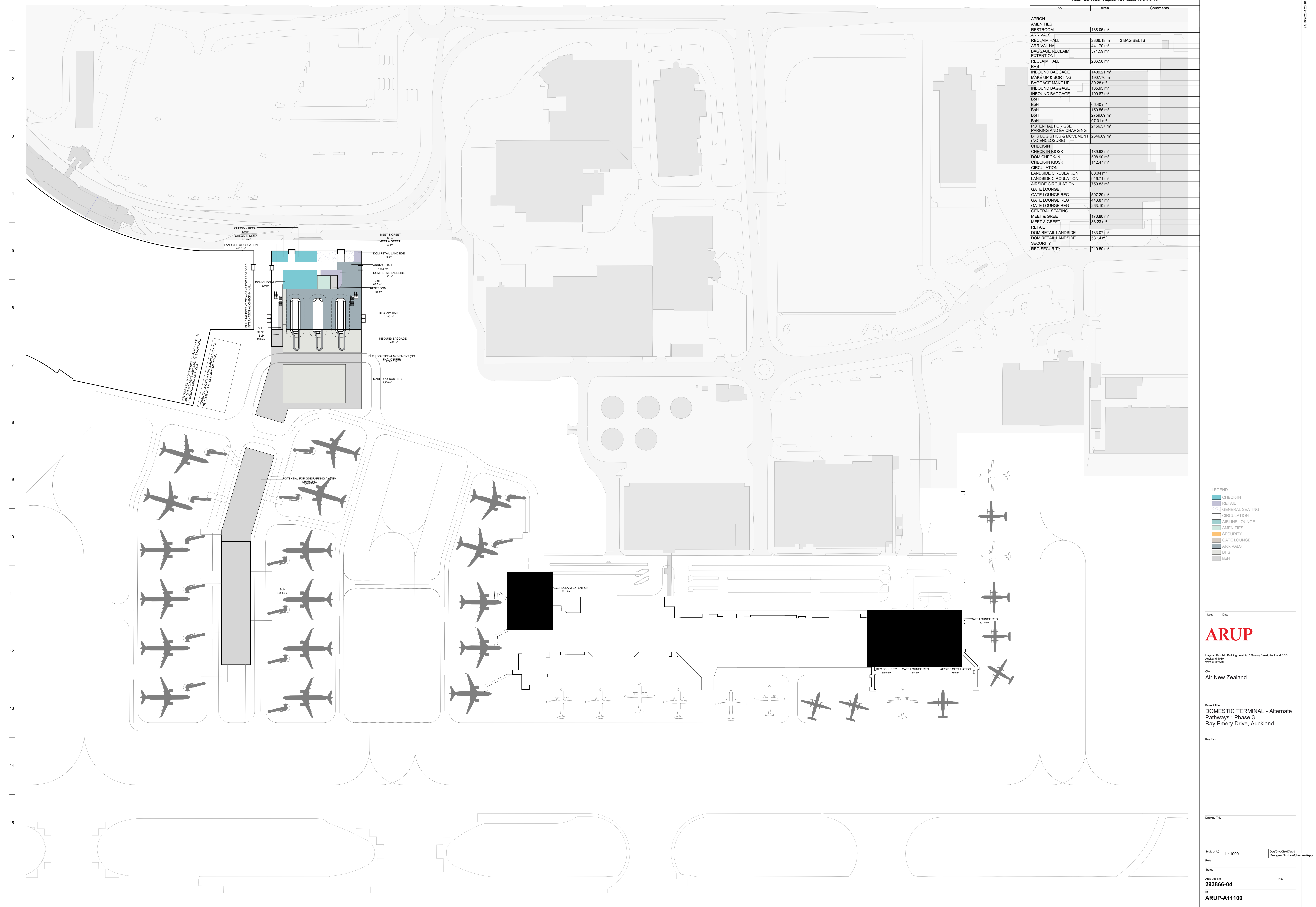
- A comparative assessment of the single and dual Code C taxiway between Pier A1 and the DTB is currently being undertaken to quantify the airfield delay associated with 2033 and 2043 busy day schedules. *This work is currently in progress.*

- 

- 


Appendix A

Consolidated Plans Set

Area	Area	Comments
APRON		
AMENITIES		
RESTROOM	138.05 m ²	
ARRIVALS		
RECLAIM HALL	2366.16 m ²	3 BAG BELTS
ARRIVAL HALL	441.70 m ²	
BAGGAGE RECLAIM EXTENSION	371.59 m ²	
RECLAIM HALL	286.58 m ²	
BHS		
INBOUND BAGGAGE	1409.21 m ²	
MAKE UP & SORTING	1907.76 m ²	
BAGGAGE MAKE UP	89.29 m ²	
INBOUND BAGGAGE	135.95 m ²	
INBOUND BAGGAGE	199.87 m ²	
BoH		
BoH	66.40 m ²	
BoH	150.56 m ²	
BoH	2759.69 m ²	
BoH	97.01 m ²	
POTENTIAL FOR GSE PARKING AND EV CHARGING	2156.57 m ²	
BHS LOGISTICS & MOVEMENT (NO ENCLOSURE)	2646.69 m ²	
CHECK-IN		
CHECK-IN KIOSK	189.93 m ²	
DOM CHECK-IN	508.90 m ²	
CHECK-IN KIOSK	142.47 m ²	
CIRCULATION		
LANDSIDE CIRCULATION	68.04 m ²	
LANDSIDE CIRCULATION	916.71 m ²	
AIRSIDE CIRCULATION	759.83 m ²	
GATE LOUNGE		
GATE LOUNGE REG	507.29 m ²	
GATE LOUNGE REG	443.87 m ²	
GATE LOUNGE REG	263.10 m ²	
GENERAL SEATING		
MEET & GREET	170.80 m ²	
MEET & GREET	83.23 m ²	
RETAIL		
DOM RETAIL LANDSIDE	133.07 m ²	
DOM RETAIL LANDSIDE	58.14 m ²	
REG SECURITY	219.50 m ²	



- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

Issue Date

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Client
Air New Zealand

Project Title
DOMESTIC TERMINAL - Alternate Pathways - Phase 3
Ray Emery Drive, Auckland

Key Plan

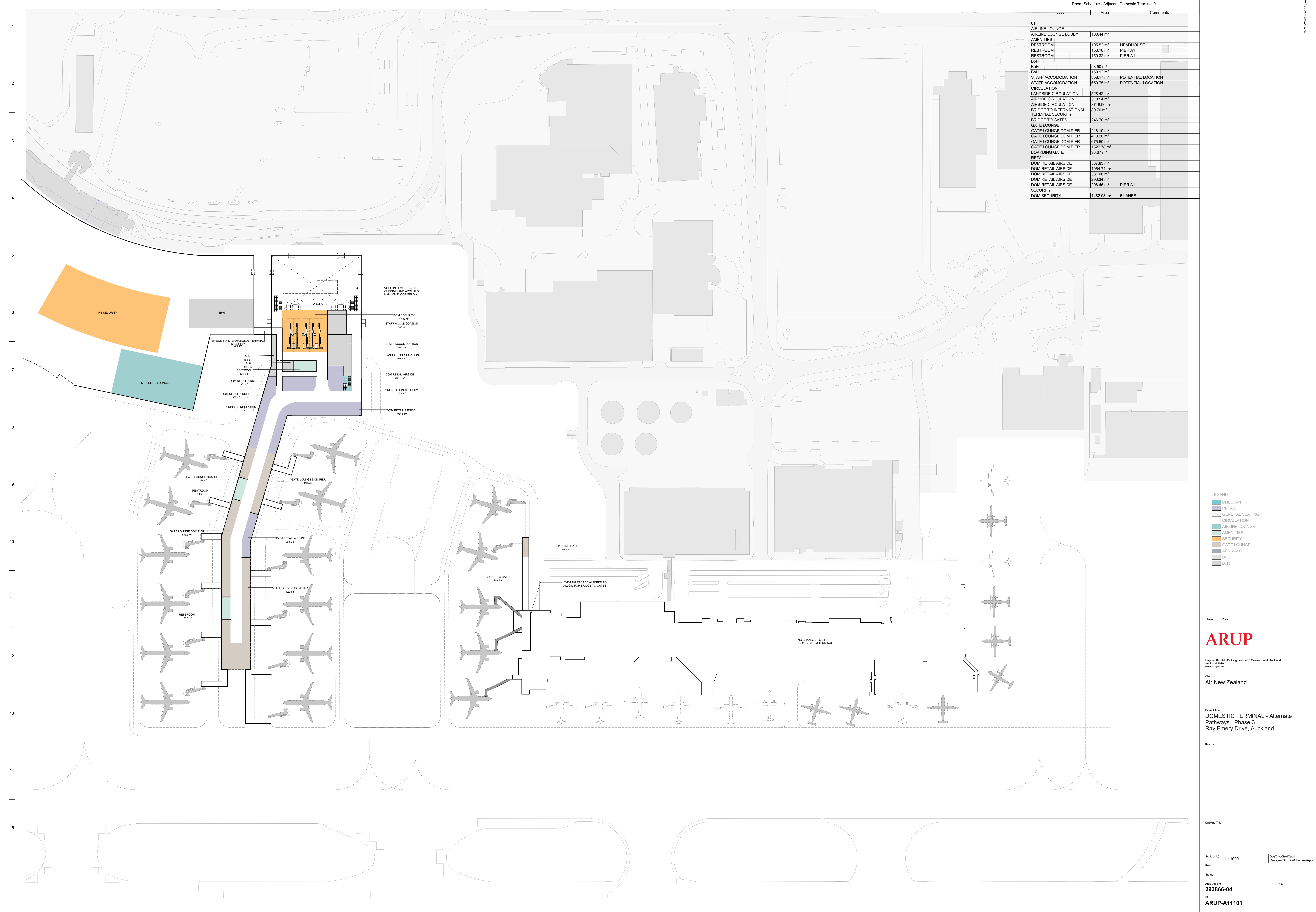
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Room Schedule - Adjacent Domestic Terminal 01

Area	Comments
01 AIRLINE LOUNGE	
AIRLINE LOUNGE LOBBY	100.44 m ²
AMENITIES	
RESTROOM	165.52 m ² HEADHOUSE
RESTROOM	156.16 m ² PIER A1
RESTROOM	150.32 m ² PIER A1
BaH	
BaH	98.50 m ²
BaH	169.12 m ²
STAFF ACCOMMODATION	358.17 m ² POTENTIAL LOCATION
STAFF ACCOMMODATION	659.75 m ² POTENTIAL LOCATION
CIRCULATION	
LANDSIDE CIRCULATION	528.42 m ²
AIRSIDE CIRCULATION	310.54 m ²
AIRSIDE CIRCULATION	3718.90 m ²
BRIDGE TO INTERNATIONAL	89.70 m ²
TERMINAL SECURITY	
BRIDGE TO GATES	246.70 m ²
GATE LOUNGE	
GATE LOUNGE DOM PIER	218.10 m ²
GATE LOUNGE DOM PIER	410.26 m ²
GATE LOUNGE DOM PIER	675.50 m ²
GATE LOUNGE DOM PIER	1327.78 m ²
BOARDING GATE	93.9 m ²
RETAIL	
DOM RETAIL ARSIDE	537.83 m ²
DOM RETAIL ARSIDE	1064.74 m ²
DOM RETAIL ARSIDE	381.06 m ²
DOM RETAIL ARSIDE	296.34 m ²
DOM RETAIL ARSIDE	298.46 m ² PIER A1
SECURITY	
DOM SECURITY	1482.98 m ² 5 LANES

- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BaH
 - BaH

Issue Date

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Key Plan

Drawing Title

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Role

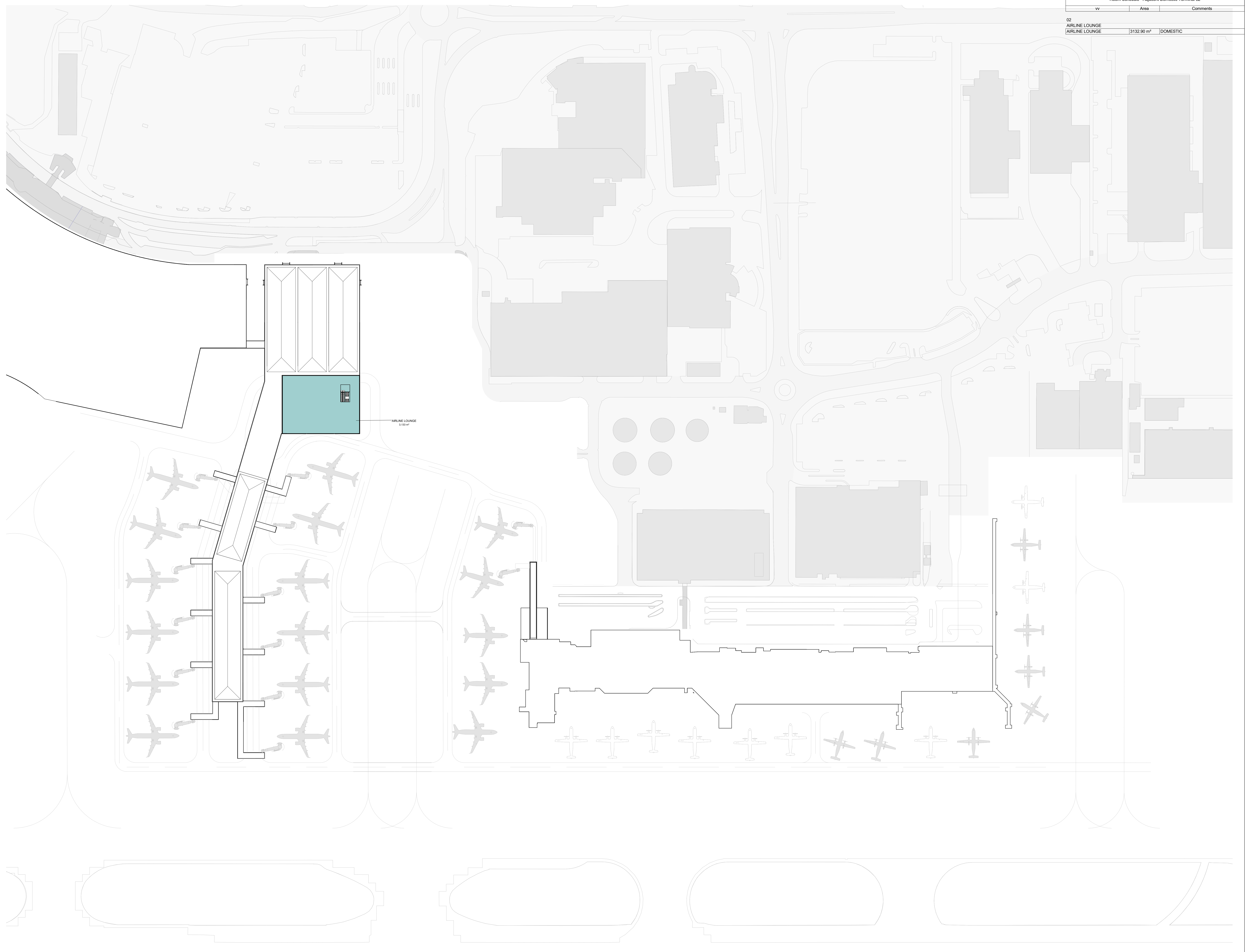
Status

Arup Job No
293866-04

File

© **ARUP-A11101**

Room Schedule - Adjacent Domestic Terminal 02		
vw	Area	Comments
02	AIRLINE LOUNGE	
	AIRLINE LOUNGE	3132.90 m ² DOMESTIC



AIRLINE LOUNGE
3,133 sqm

- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

Issue	Date



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Key Plan

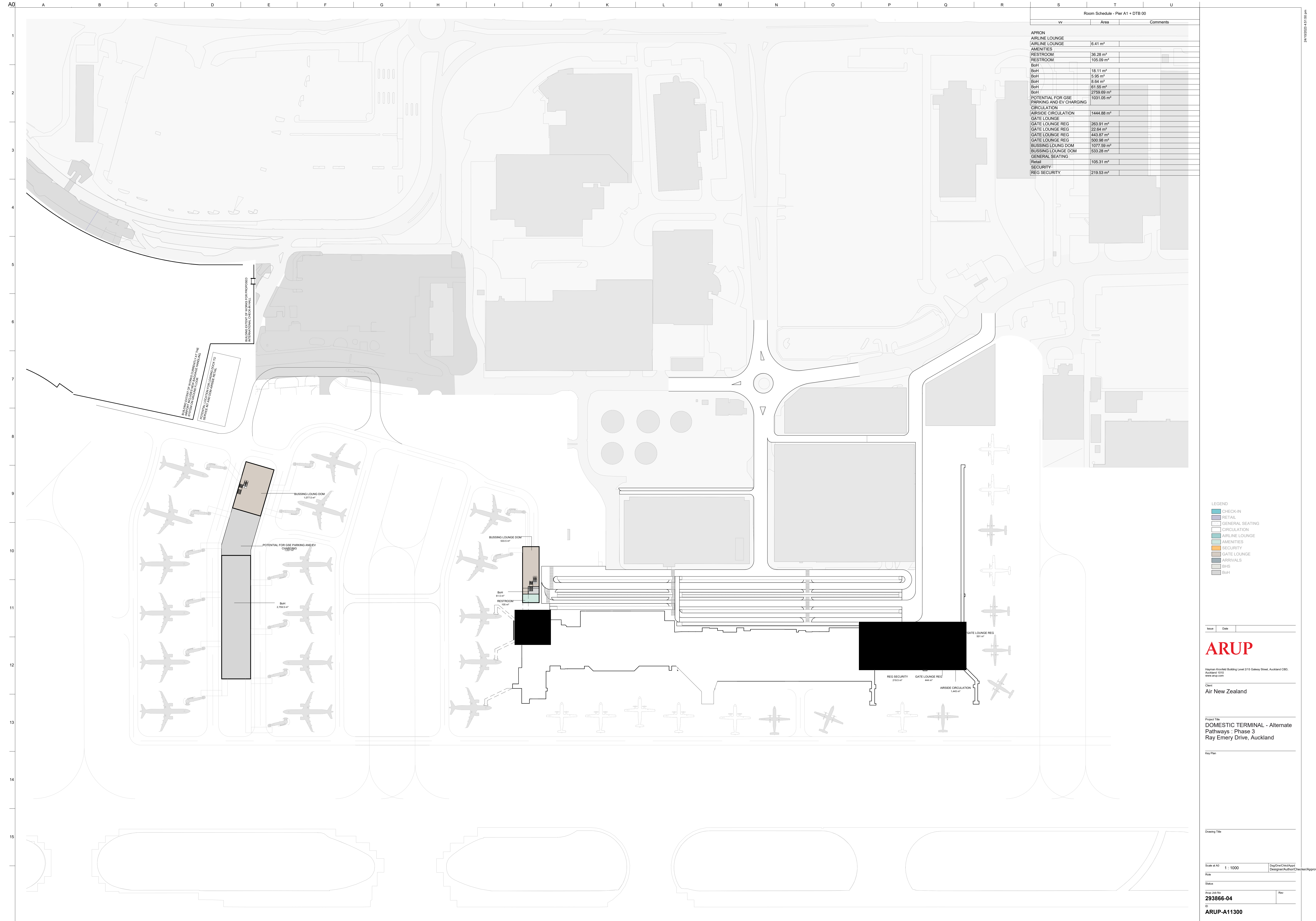
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Status

Arup Job No
293866-04

ID
ARUP-A11102



APPROXIMATE EXTENT OF WORKS FOR PROPOSED AIRLINE LOUNGE AND AMENITIES AT THE AIRLINE LOUNGE AND AMENITIES. THE PARKING POTENTIAL FOR GSE AND EV CHARGING SERVICES AT THIS LOCATION IS SUBJECT TO A SEPARATE ANALYSIS TO BE CONDUCTED BY THE CLIENT.

REMAINING EXTENT OF WORKS FOR PROPOSED INTERNATIONAL CHECK-IN HALL.

Room Schedule - Pier A1 + DTB 00		
vw	Area	Comments
APRON		
AIRLINE LOUNGE	6.41 m ²	
AMENITIES	36.28 m ²	
RESTROOM	105.09 m ²	
BoH	18.11 m ²	
BoH	5.95 m ²	
BoH	8.64 m ²	
BoH	61.55 m ²	
BoH	2789.69 m ²	
POTENTIAL FOR GSE PARKING AND EV CHARGING	1031.06 m ²	
CIRCULATION		
AIRSIDE CIRCULATION	1444.88 m ²	
GATE LOUNGE	263.91 m ²	
GATE LOUNGE REG	22.64 m ²	
GATE LOUNGE REG	443.87 m ²	
GATE LOUNGE REG	500.98 m ²	
BUSSEING LOUNG DOM	1077.5 m ²	
BUSSEING LOUNG DOM	533.28 m ²	
GENERAL SEATING	105.31 m ²	
Retail		
SECURITY		
REG SECURITY	219.53 m ²	

- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

Issue Date

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Air New Zealand

Project Title
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Ray Emery Drive, Auckland

Key Plan

Drawing Title

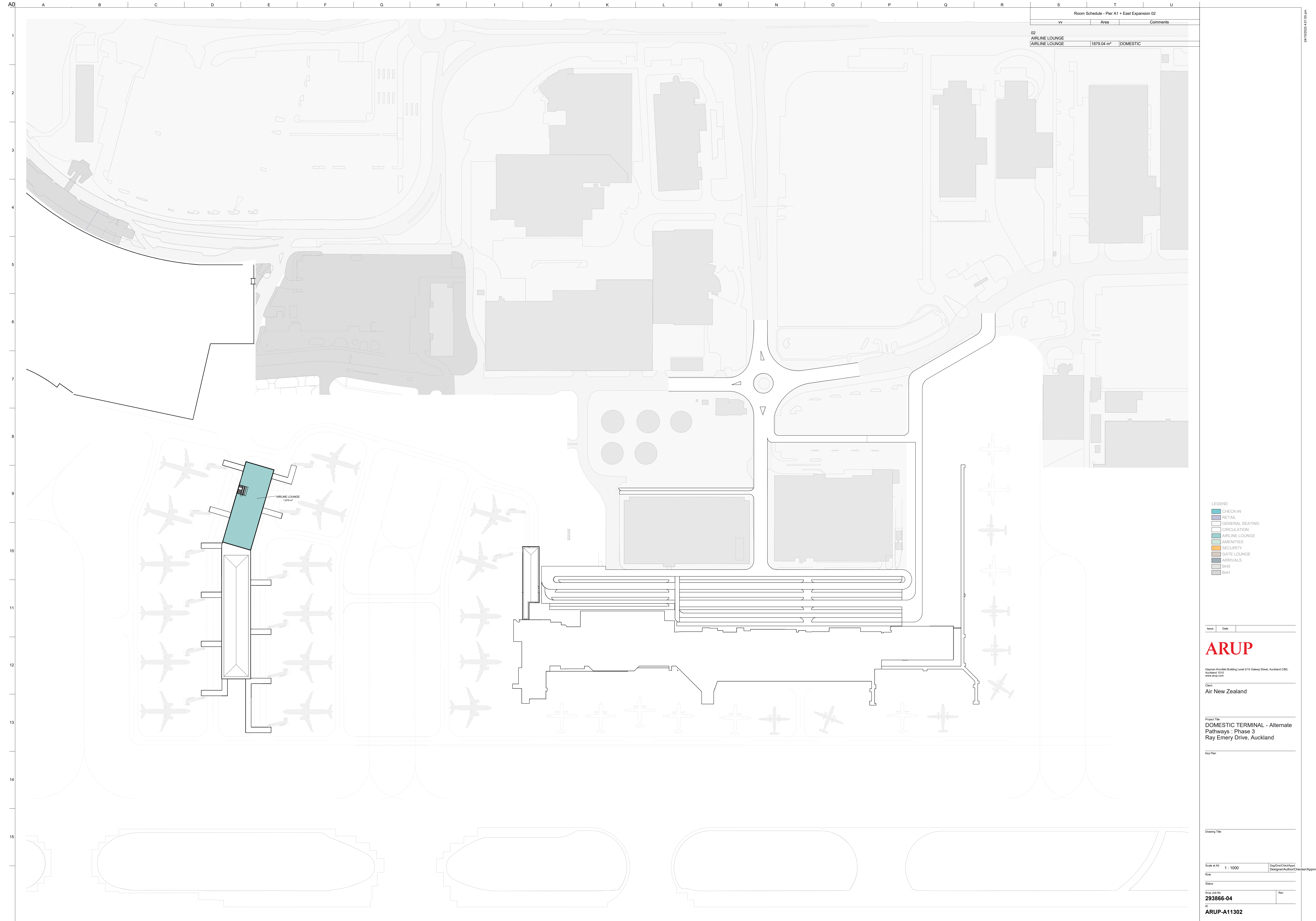
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Date

Rev

293866-04

ARUP-A11300



Room Schedule - Pier A1 + East Expansion 02		
vw	Area	Comments
02	AIRLINE LOUNGE	
	AIRLINE LOUNGE	1879.04 m ² DOMESTIC

- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - Both

Issue	Date

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Client
Air New Zealand

Project Title
DOMESTIC TERMINAL - Alternate Pathways - Phase 3 Ray Emery Drive, Auckland

Key Plan

Drawing Title

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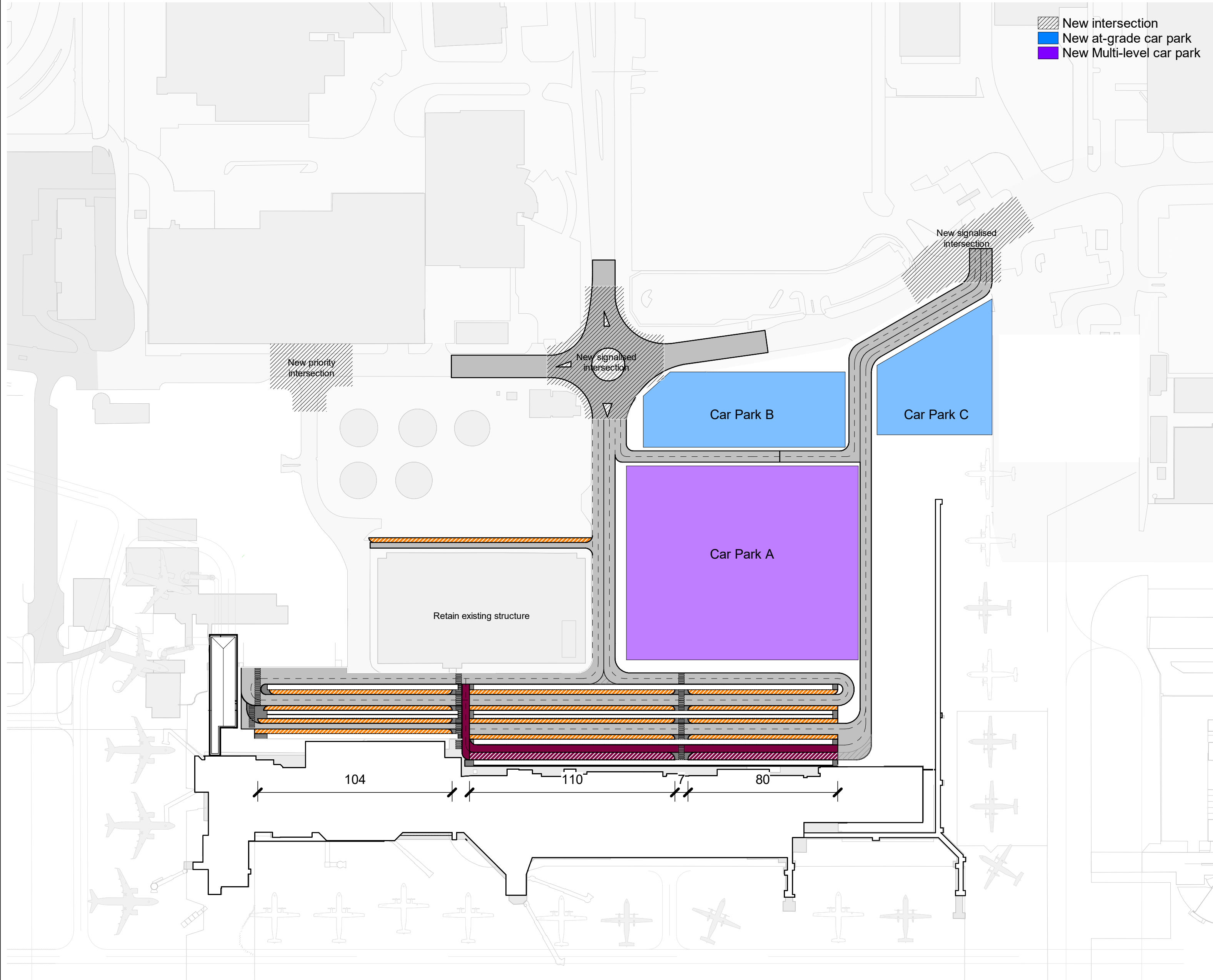
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ID
ARUP-A11302

A3 A B C D E F G

1
2
3
4
5

-  New intersection
-  New at-grade car park
-  New Multi-level car park



Transport related areas

Road and kerbs:
Road and forecourt parking (excl. intersections) - 17,000sqm
Forecourt Kerb - 3,500 sqm

Intersections:
New signalled intersections - 2
New priority intersections - 1

Car Parks:
Car Park A
New structure Ground + 4 levels @ 3m levels include vertical transport, ramping, assume natural ventilation Floor plate: 12,800sqm @ approx. 1,900 spaces

Car Park B
New at grade Include two access points Floor plate: 4,300sqm @ approx. 200 spaces

Car Park C
New at grade holding area (car park) Include two access points Floor plate: 3,300sqm

Issue	Date

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Air New Zealand

Project Title
DOMESTIC TERMINAL - Alternate Pathways : Phase 3
Ray Emery Drive, Auckland

Drawing Title

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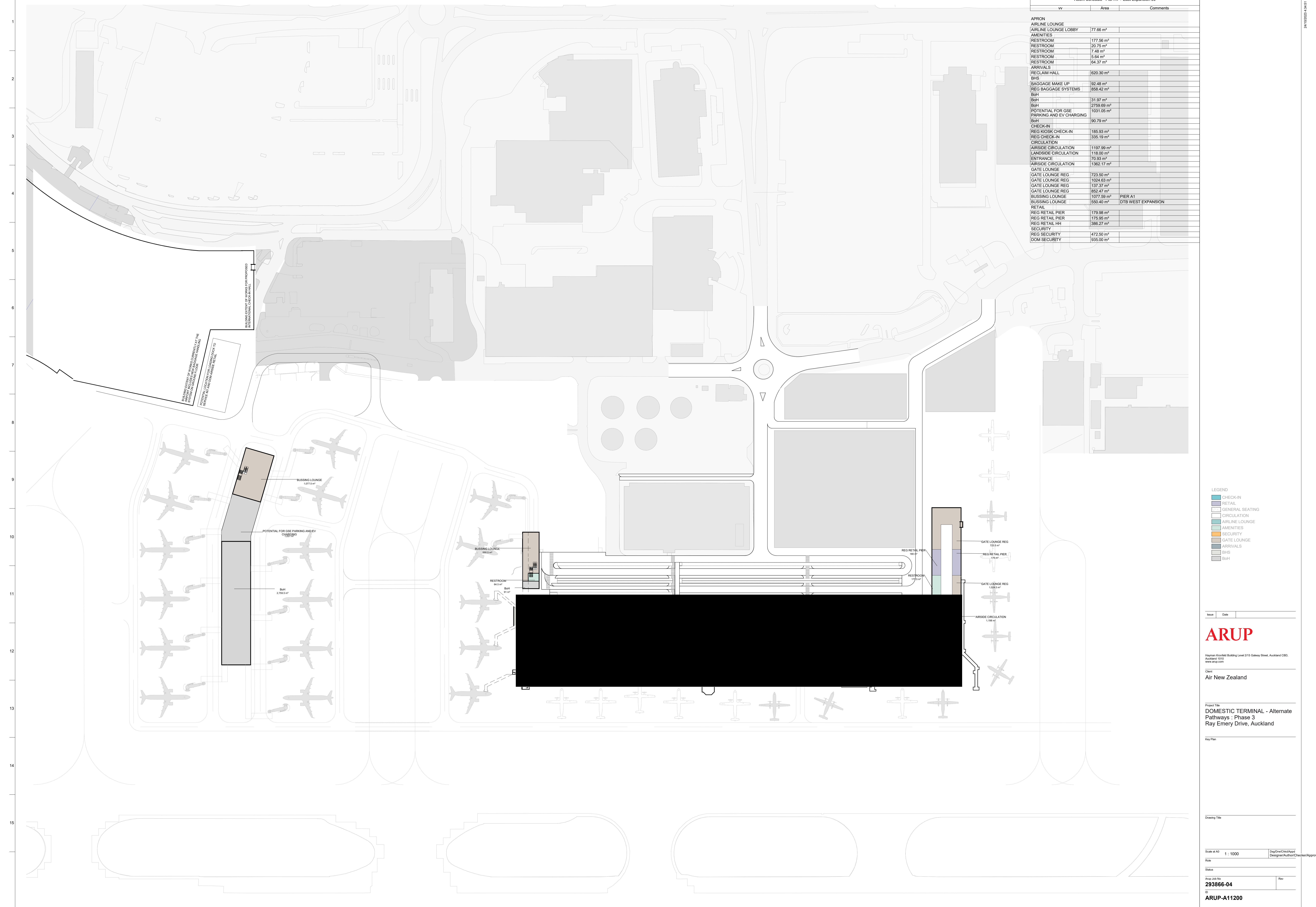
Role

Status

Arup Job No **293866-04** Rev

ID **ARUP-A006**

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APPROXIMATE EXTENT OF WORKS FOR PROPOSED INTERNATIONAL CHECK-IN HALL

APPROXIMATE EXTENT OF WORKS FOR PROPOSED AIRLINE LOUNGE AND AIRLINE LOBBY AT THE AIRLINE LOUNGE AND AIRLINE LOBBY

POTENTIAL FOR GSE PARKING AND EV CHARGING SERVICES BY AIRPORT OPERATIONS TO BE PROVIDED BY AIRPORT OPERATIONS WITHIN THE AIRSIDE CIRCULATION

Area	Area	Comments
APRON		
AIRLINE LOUNGE		
AIRLINE LOUNGE LOBBY	77.66 m ²	
AMENITIES		
RESTROOM	177.56 m ²	
RESTROOM	20.75 m ²	
RESTROOM	7.48 m ²	
RESTROOM	5.64 m ²	
RESTROOM	64.37 m ²	
ARRIVALS		
RECLAIM HALL	620.30 m ²	
BHS		
BAGGAGE MAKE UP	92.48 m ²	
REG BAGGAGE SYSTEMS	858.42 m ²	
BoH		
BoH	31.87 m ²	
BoH	2759.69 m ²	
POTENTIAL FOR GSE PARKING AND EV CHARGING	1031.05 m ²	
BoH	90.79 m ²	
CHECK-IN		
REG KIOSK CHECK-IN	185.93 m ²	
REG CHECK-IN	335.19 m ²	
CIRCULATION		
AIRSIDE CIRCULATION	1197.99 m ²	
LANDSIDE CIRCULATION	118.00 m ²	
ENTRANCE	70.93 m ²	
AIRSIDE CIRCULATION	1362.17 m ²	
GATE LOUNGE		
GATE LOUNGE REG	723.50 m ²	
GATE LOUNGE REG	1024.63 m ²	
GATE LOUNGE REG	137.37 m ²	
GATE LOUNGE REG	852.47 m ²	
BUSSING LOUNGE	1077.59 m ²	PIER A1
BUSSING LOUNGE	550.40 m ²	DTB WEST EXPANSION
REG RETAIL PIER	179.98 m ²	
REG RETAIL PIER	175.95 m ²	
REG RETAIL HH	386.27 m ²	
SECURITY		
REG SECURITY	472.50 m ²	
DOM SECURITY	635.00 m ²	

- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

Issue Date

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Client
Air New Zealand

Project Title
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Ray Emery Drive, Auckland

Key Plan

Drawing Title

Scale of A0 1 : 1000

Role

Status

Arup Job No
293866-04

ID
ARUP-A11200

Area	Comments
01 AMENITIES	
RESTROOM	150.32 m ²
CIRCULATION	
BRIDGE TO GATES	205.13 m ²
AIRSIDE CIRCULATION	1478.49 m ²
GATE LOUNGE	
GATE LOUNGE DOM HH	212.86 m ²
GATE LOUNGE DOM HH	676.91 m ²
GATE LOUNGE DOM HH	1327.78 m ²
GATE LOUNGE DOM HH	348.44 m ²
BOARDING GATE	230.78 m ²
RETAIL	
DOM RETAIL AIRSIDE	298.24 m ² PIER A1



- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

Issue Date

ARUP

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Project Title
DOMESTIC TERMINAL - Alternate Pathways - Phase 3 Ray Emery Drive, Auckland

Key Plan

Drawing Title

Scale of A0 1 : 1000

Role

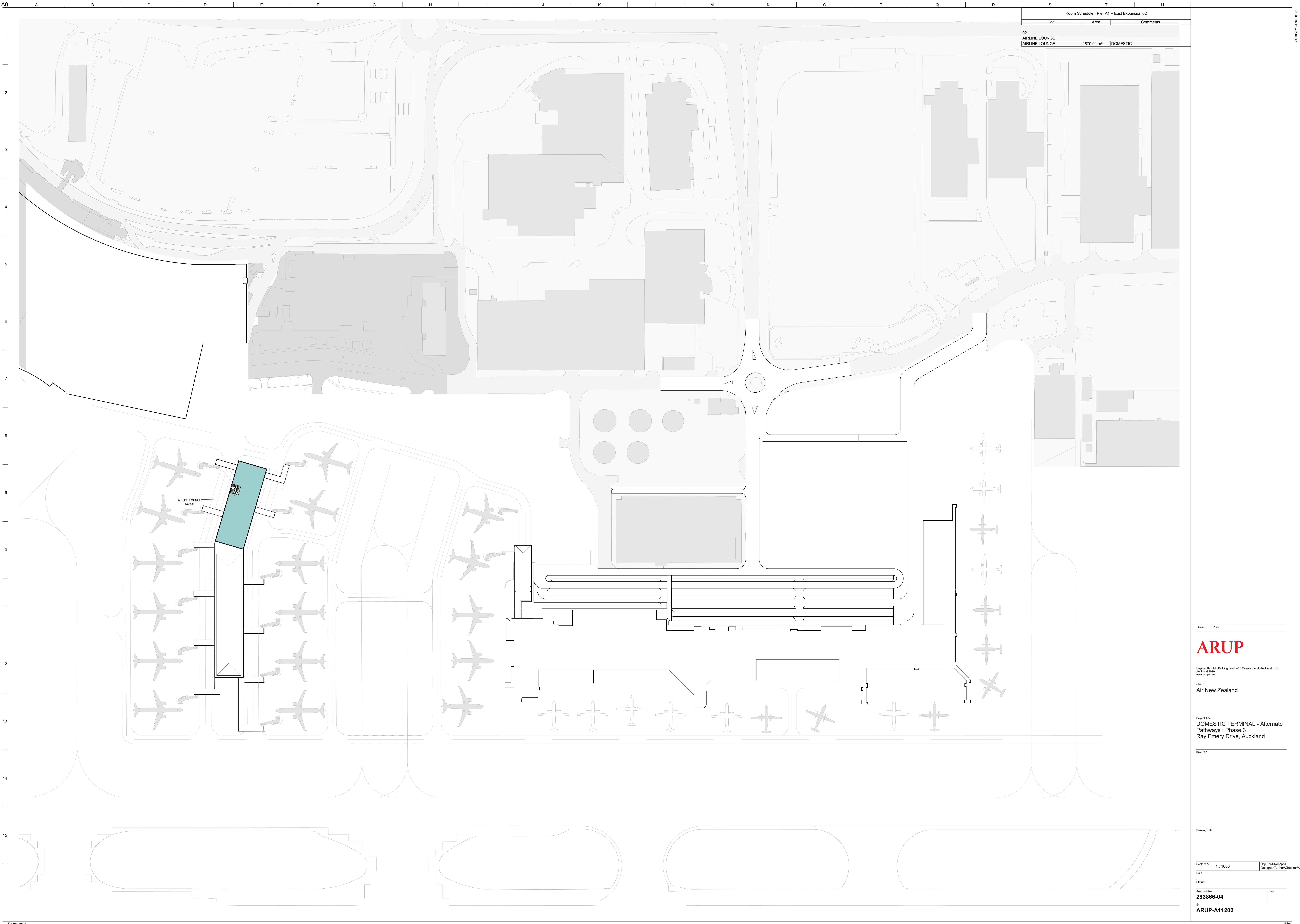
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Arup Job No

293866-04

ID

ARUP-A11201



Room Schedule - Pier A1 + East Expansion 02		
vv	Area	Comments
02	AIRLINE LOUNGE	
	AIRLINE LOUNGE	1879.04 m ² DOMESTIC

AIRLINE LOUNGE
1879 m²

Issue	Date
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Client Air New Zealand	
Project Title DOMESTIC TERMINAL - Alternate Pathways - Phase 3 Ray Emery Drive, Auckland	
Key Plan	
Drawing Title	
Scale of A0 1 : 1000	<small>Dwg/Dwn/Clrd/Issd/</small> <small>Designer/Author/Checker/Approver</small>
Rev 293866-04	Rev
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A3 A B C D E F G




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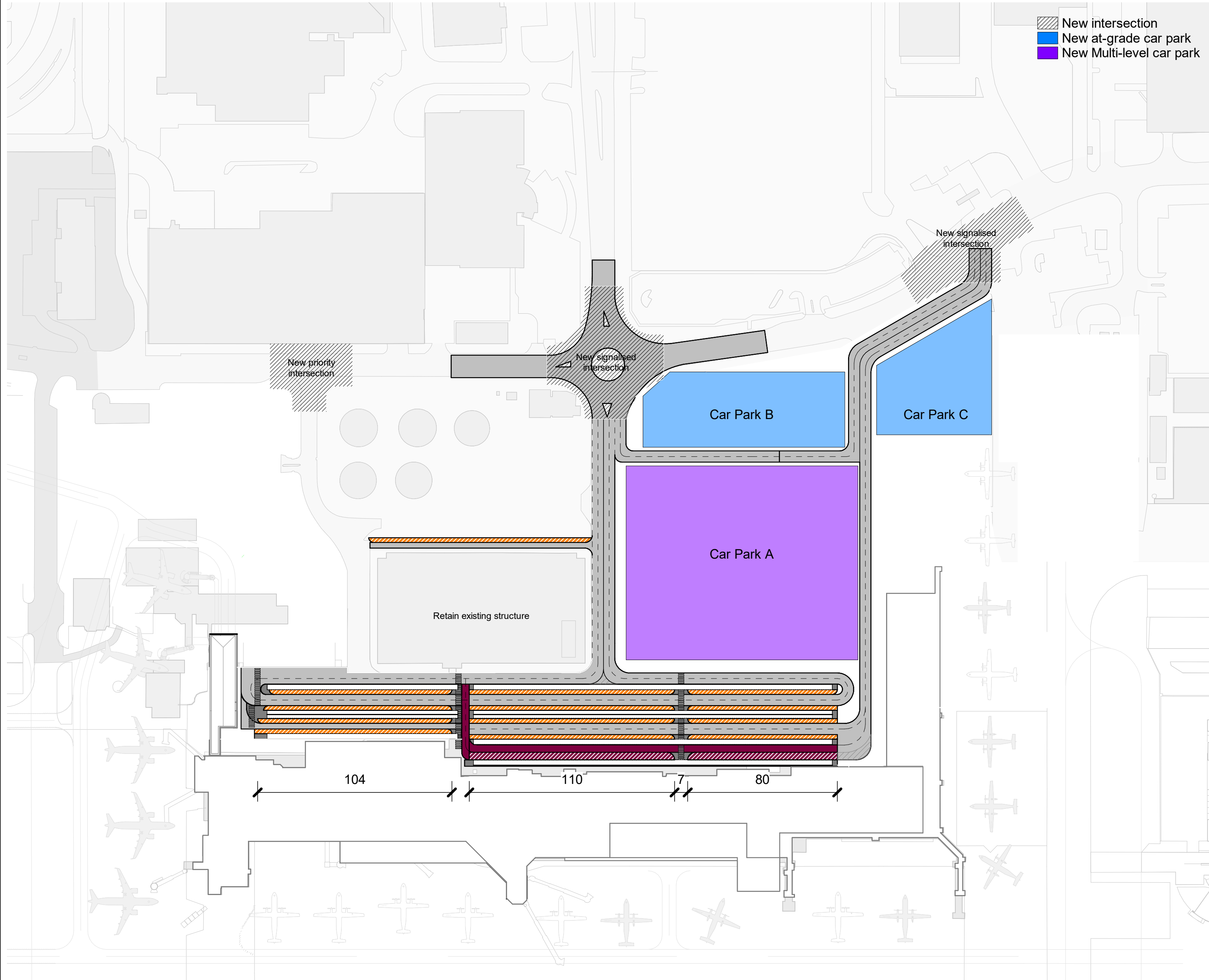
2

3

4

5

-  New intersection
-  New at-grade car park
-  New Multi-level car park



Transport related areas

Road and kerbs:
 Road and forecourt parking (excl. intersections) - 17,000sqm
 Forecourt Kerb - 3,500 sqm

Intersections:
 New signalled intersections - 2
 New priority intersections - 1

Car Parks:
Car Park A
 New structure Ground + 4 levels @ 3m levels include vertical transport, ramping, assume natural ventilation Floor plate: 12,800sqm @ approx. 1,900 spaces

Car Park B
 New at grade Include two access points Floor plate: 4,300sqm @ approx. 200 spaces

Car Park C
 New at grade holding area (car park) Include two access points Floor plate: 3,300sqm

Issue	Date

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Drawing Title

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Role

Status

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293866-04 Rev

ID
ARUP-A006

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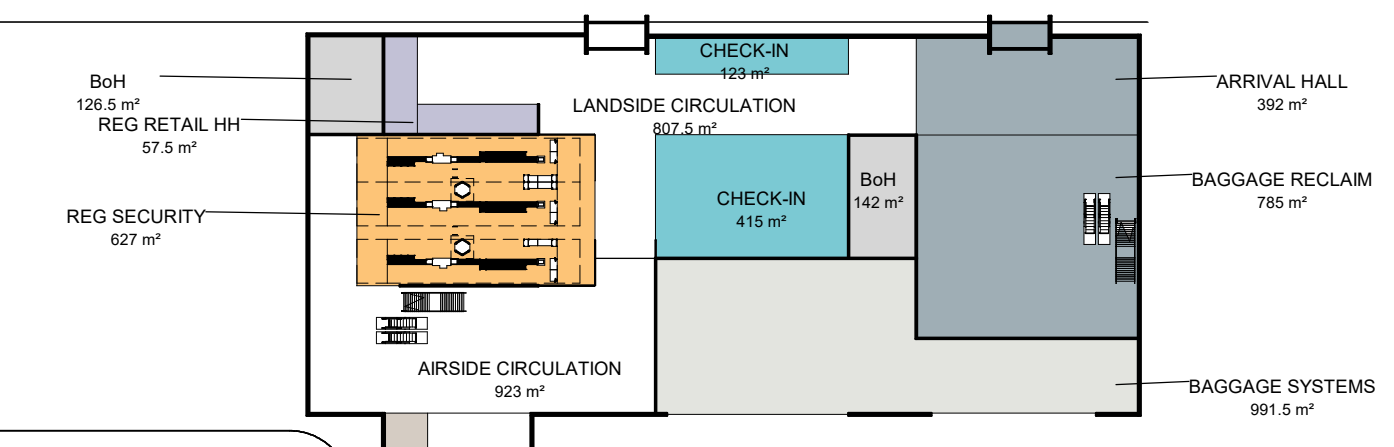
Room Schedule - Pier A1 +A3 + Reg Headhouse 00

Area	Comments
APRON	
AMENITIES	
RESTROOM	64.37 m ²
ARRIVALS	
ARRIVAL HALL	391.92 m ²
BAGGAGE RECLAIM	784.91 m ²
BHS	
BAGGAGE SYSTEMS	991.62 m ²
BoH	
BoH	142.09 m ²
BoH	126.28 m ²
BoH	2769.69 m ²
BoH	100.80 m ²
CHECK-IN	
CHECK-IN	414.85 m ²
CHECK-IN	123.15 m ²
CIRCULATION	
LANDSIDE CIRCULATION	807.34 m ²
AIRSIDE CIRCULATION	2006.27 m ²
AIRSIDE CIRCULATION	922.81 m ²
GATE LOUNGE	
GATE LOUNGE REG	1265.32 m ²
GATE LOUNGE DOM HH	1015.49 m ²
BUSSING LOUNGE	1077.59 m ²
BUSSING LOUNGE	543.09 m ²
RETAIL	
REG RETAIL HH	62.51 m ²
REG RETAIL HH	57.31 m ²
REG SECURITY	627.12 m ²

APPROXIMATE EXTENT OF WORKS FOR PROPOSED INTERNATIONAL CHECK-IN HALL

APPROXIMATE EXTENT OF WORKS FOR PROPOSED INTERNATIONAL CHECK-IN HALL

APPROXIMATE EXTENT OF WORKS FOR PROPOSED INTERNATIONAL CHECK-IN HALL



- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

Issue Date

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Project Title
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Ray Emery Drive, Auckland

Key Plan

Drawing Title

Scale of A0 1 : 1000

Role

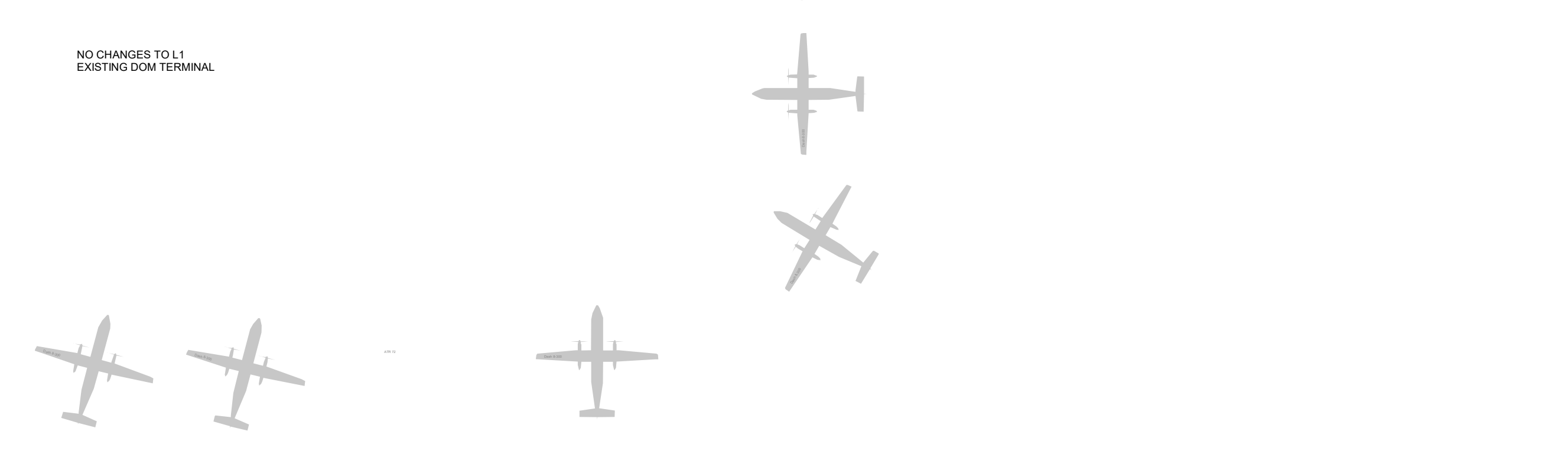
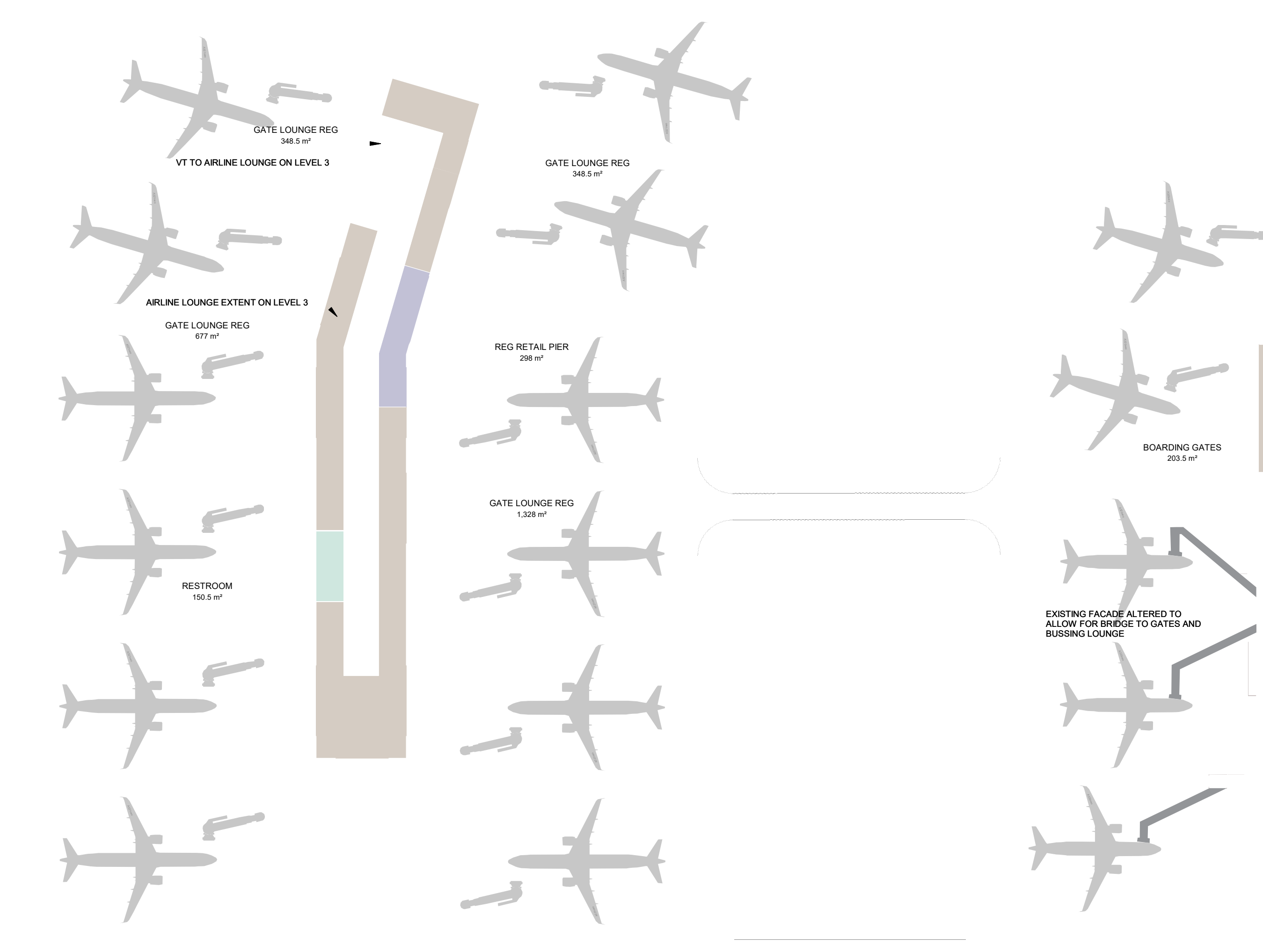
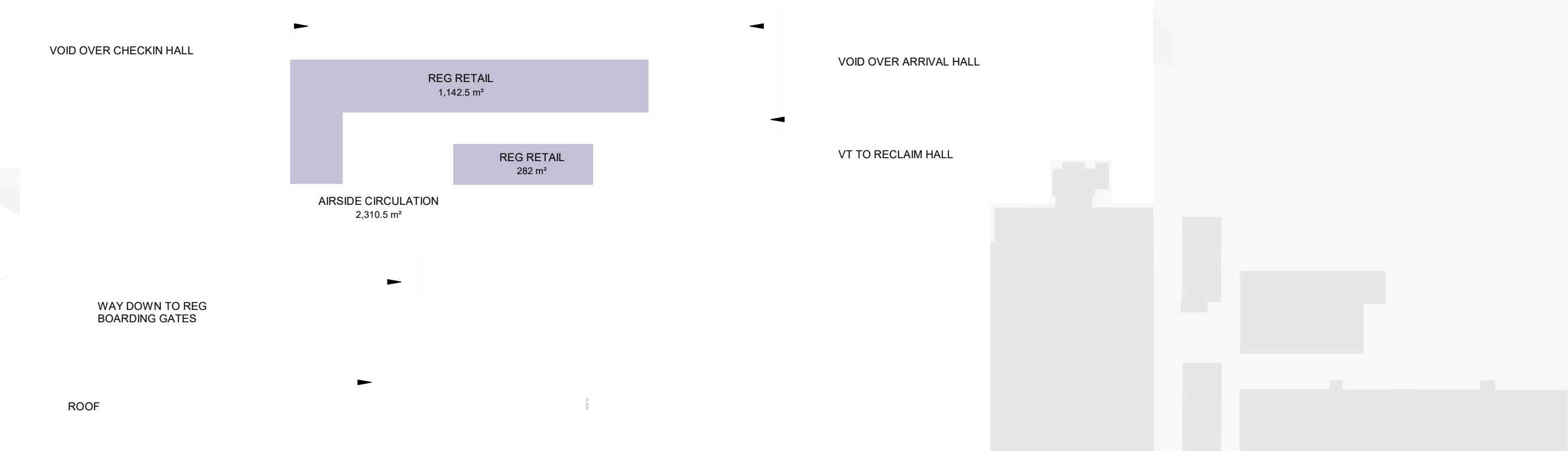
Status

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293866-04

File

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ROOM	Area	Comments
01		
AMENITIES		
RESTROOM	150.32 m ²	
CIRCULATION		
DOM RETAIL AIRSIDE	1479.49 m ²	
DOM RETAIL AIRSIDE	183.04 m ²	
DOM RETAIL AIRSIDE	171.53 m ²	
BRIDGE TO BUSSING LOUNGE	585.59 m ²	
AIRSIDE CIRCULATION	2310.67 m ²	
GATE LOUNGE		
GATE LOUNGE REG	676.91 m ²	
GATE LOUNGE REG	212.88 m ²	
GATE LOUNGE REG	348.44 m ²	
GATE LOUNGE REG	1327.78 m ²	
BOARDING GATES	203.31 m ²	
RETAIL		
REG RETAIL PIER	298.24 m ²	
REG RETAIL	1142.73 m ²	
REG RETAIL	282.15 m ²	



- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

Issue Date

ARUP

Hoeman Koorndt Building Level 215 Gateway Street, Auckland CBD, Auckland 1010
www.arup.com

Client
Air New Zealand

Project Title
DOMESTIC TERMINAL - Alternate Pathways - Phase 3
Ray Emery Drive, Auckland

Key Plan

Drawing Title

Scale of A0 1 : 1000

Role

Status

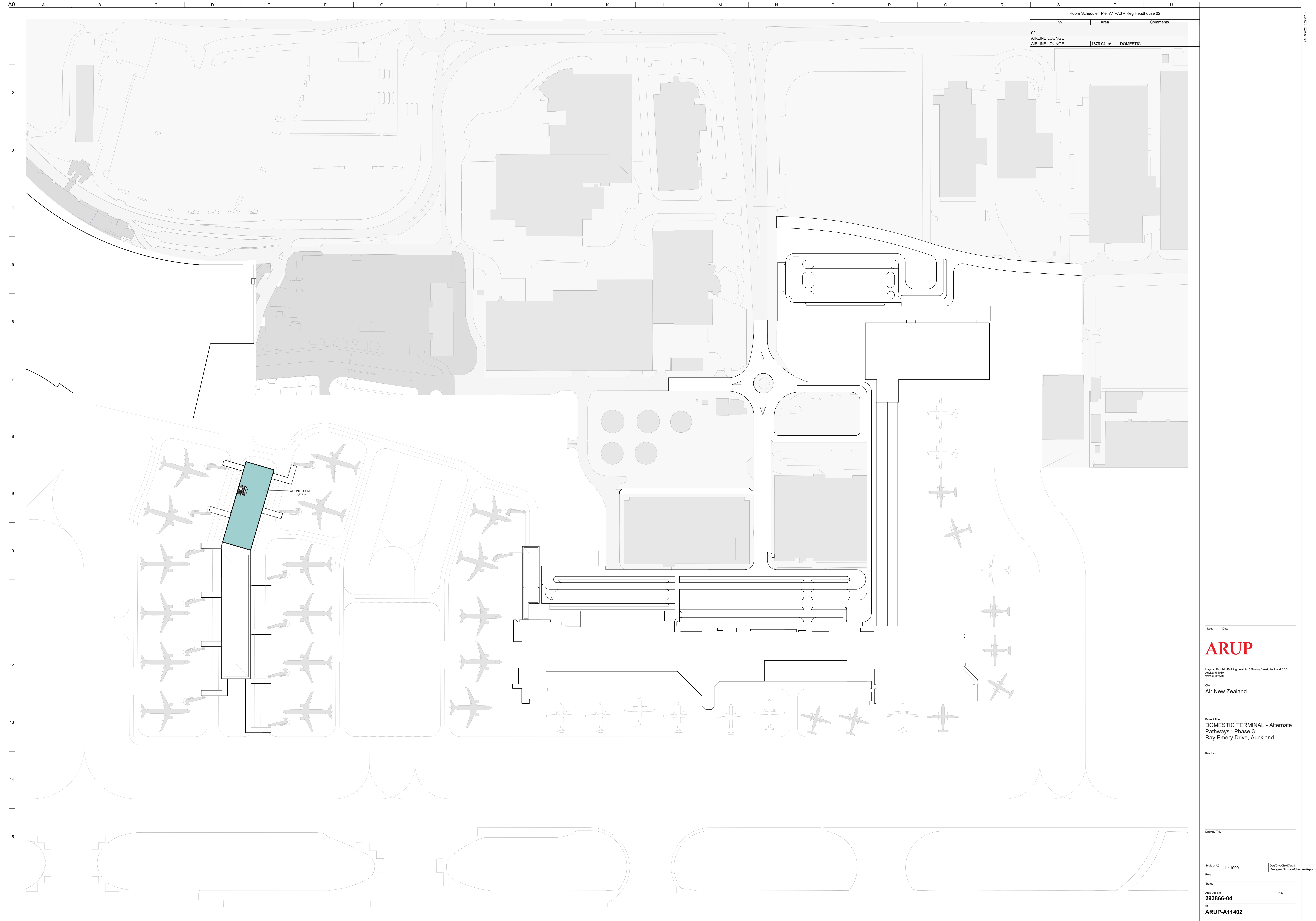
Arup Job No

293866-04

ID

ARUP-A11401

© Arup



Room Schedule - Pier A1 +A3 + Reg Headhouse 02		
vw	Area	Comments
02	AIRLINE LOUNGE	
	AIRLINE LOUNGE	1879.04 m ² DOMESTIC

Issue	Date
ARUP	
<small>Hoeman Koorbel Building Level 215 Gateway Street, Auckland CBD, Auckland 1010 www.arup.com</small>	
Client Air New Zealand	
Project Title DOMESTIC TERMINAL - Alternate Pathways : Phase 3 Ray Emery Drive, Auckland	
Key Plan	
Drawing Title	
Scale of A0	1 : 1000
<small>Design/Check/Approve Designer/Author/Checker/Approver</small>	
<small>Arup Job No.</small> 293866-04	<small>Rev</small>
<small>ID</small> ARUP-A11402	

A3 A B C D E F G

1

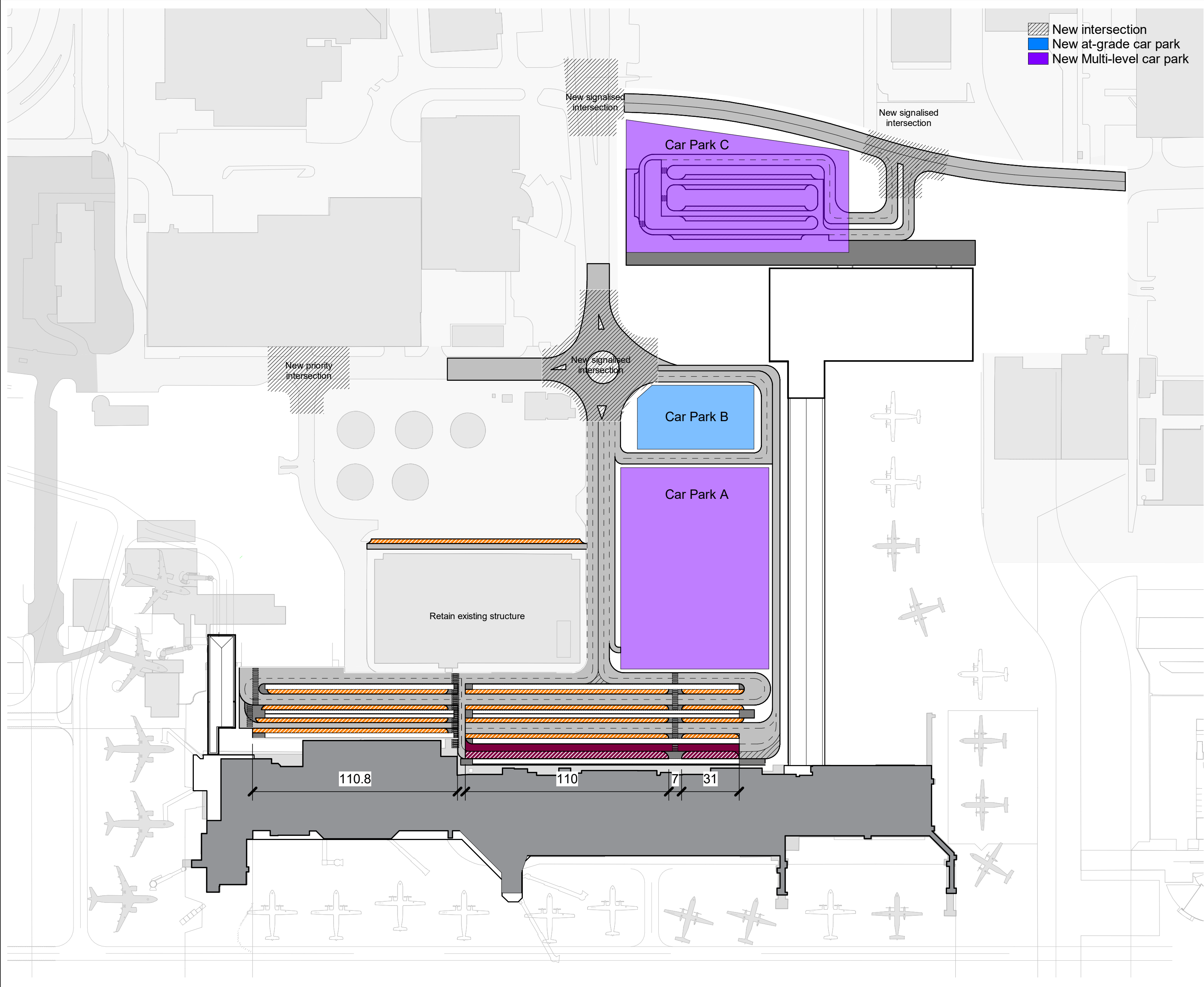
2

3

4

5

Do not scale



New intersection
 New at-grade car park
 New Multi-level car park

Transport related areas

Road and kerbs:
 Road and forecourt parking (excl. intersections) - 21,000sqm
 Forecourt Kerb - 8,500 sqm & assume shelters to be provided on kerbs.

Intersections:
 New signalled intersections - 3
 New priority intersections - 1

Car Parks:
Car Park A
 New structure Ground + 4 levels @ 3m levels
 Include vertical transport, ramping, assume natural ventilation
 Floor plate: 8,500sqm @ approx. 1,200 spaces

Car Park B
 New at grade holding area (car park) Include two access points
 Floor plate: 2,000sqm

Car Park C
 New structure Ground + 4 levels @ 5m level (ground) and 3m levels (L1+)
 Include vertical transport, ramping, assume natural ventilation
 Floor plate: 7,300sqm @ approx. 800 spaces

Issue	Date

ARUP

Hayman Kronfeld Building Level 2/15 Galway Street, Auckland CBD, Auckland 1010
 www.arup.com

Client
Air New Zealand

Project Title
DOMESTIC TERMINAL - Alternate Pathways : Phase 3
 Ray Emery Drive, Auckland

Drawing Title

Scale at A3 1 : 2000 Dwg/Draw/Chk/Issd 0/0/0/0

Role

Status

Arup Job No
293866-04 Rev

ID
ARUP-A004

24/10/2023 5:27:47 pm

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Appendix B

Cost Estimate Details



AFFORDABLE PATHWAYS PHASE 3



WT

AIR NEW ZEALAND

INTRODUCTION

The following four cost options for the redevelopment of Auckland Airport are:

- Based on the scope of works identified on the Arup costing and staging plans issues 18 October 2023
- Costs have been categorised into:
 - Group 1 projects for direct comparison against AIAL's reported \$2.2B budget.
 - Group 2 additional projects excluded from the reports \$2.2B budget.
- All costs exclude GST
- All costs include escalation to the mid point of the construction period at a rate of 4% for the 23-24 period and 2.5% per annum thereafter.
- All costs include:
 - 2% for consenting
 - 15% for professional fees
 - 3.8% for AIAL management costs
 - 25% for design and construction contingency

EXCLUSIONS

The main exclusions are noted below:

1. GST
2. Financing Costs
3. Land purchases if required
4. Legal Costs
5. Tenant Disruption Costs
6. Costs associated with the loss of amenity
7. Insurances
8. Operational Costs

OPTION 1

GROUP 1

New Terminal / Remote Pier	2023 - 2028	30,000m2 of new terminal space. 12 x Airbridges. Check-in / baggage / security upgrades	\$792M
Domestic Terminal Capacity Upgrades	2023 - 2028	Bridge and boarding gate. 2 x Airbridges.	\$73M
	2028 - 2038	Baggage reclaim extension.	Inc above
Airside Infrastructure	2023 - 2028	GSE parking / EV charging.	\$9M
Airside Parking and Fueling	2023 - 2028	89,000m2 of new apron with extension to fueling.	\$313M
Total Option 1 – Group 1			\$1.187B

OPTION 1

GROUP 2

Domestic Terminal Building Maintenance	2023 – 2038+	Terminal repairs and compliance.	\$70M
Regional Capacity Upgrade	2023 - 2028	Gate Lounge. Airside circulation. Regional security.	\$132M
	2038	Regional stand walkway	Inc above
Airside Pavement and Fueling	2038+	43,000m2 of regional pavement. Demolition of 2 x Aero sheds	\$250M
Landslide – Curbside, Road and Forecourt Infrastructure	2023 – 2038+	None	\$0M
Landside – Control Tower	2038+	Demolition and replacement of control tower	\$400M
Total Option 1 – Group 2			\$852M

OPTION 2

GROUP 1

New Terminal / Remote Pier	2023 - 2028	10,700m ² of new terminal space including Bussing Lounge at GF and Gate Lounge at L1. 12 x Airbridges.	\$342M
Domestic Terminal Capacity Upgrades	2023 - 2028	Gate lounge retail and domestic security. 2 x Airbridges.	\$233M
	2028 - 2038	GF extension to provide Bussing Lounge. L1 boarding gate and bridge.	Inc above
	2038+	Gate lounge extension.	Inc above
Airside Infrastructure	2023 - 2028	GSE parking / EV charging.	\$5M
Airside Parking and Fueling	2023 - 2028	89,000m ² of new apron with extension to fueling.	\$313M
Total Option 2 – Group 1			\$0.893B

OPTION 2

GROUP 2

Domestic Terminal Building Maintenance	2023 – 2038+	Terminal repairs and compliance.	\$51M
Regional Capacity Upgrade	2023 - 2028	Airline lounge lobby. Airside circulation. Regional security.	\$282M
	2028 - 2038	Baggage extension.	Inc above
	2038+	Gate lounge.	Inc above
Airside Pavement and Fueling	2038+	43,000m ² of regional pavement. Demolition of 2 x aero sheds	\$250M
Landslide – Curbside, Road and Forecourt Infrastructure	2023 – 2028+	Carpark B and C (at grade). Road and forecourt (20,500m ²). 3 x intersections.	\$554M
	2028 - 2038	Carpark Building A (1900 spaces).	Inc above
Landside – Control Tower	2038+	Demolition and replacement of control tower	\$400M
Total Option 2 – Group 2			\$1.537B

OPTION 3

GROUP 1

New Terminal / Remote Pier	2023 - 2028	10,700m ² of new terminal space including Bussing Lounge at GF and Gate Lounge at L1. 12 x Airbridges.	\$342M
Domestic Terminal Capacity Upgrades	2028 - 2038	GF extension to provide Bussing Lounge. L1 boarding gate and bridge.	\$181M
	2038+	Gate lounge extension.	Inc above
Airside Infrastructure	2023 - 2028	GSE parking / EV charging.	\$5M
Airside Parking and Fueling	2023 - 2028	89,000m ² of new apron with extension to fueling.	\$313M
Total Option 3 – Group 1			\$0.841M

OPTION 3

GROUP 2

Domestic Terminal Building Maintenance	2023 – 2038+	Terminal repairs and compliance.	\$56M
Regional Capacity Upgrade	2023 - 2028	Gate Lounge. Airside circulation. Regional security.	\$293M
	2028 - 2038	Baggage Extension. Regional Security.	Inc above
	2038+	Regional stand walkway	Inc above
Airside Pavement and Fueling	2038+	43,000m ² of regional pavement. Demolition of 2 x aero sheds	\$250M
Landside – Curbside, Road and Forecourt Infrastructure	2023 – 2038+	Carpark B and C (at grade). Road and forecourt (20,500m ²). 3 x intersections.	\$554M
Landside – Control Tower	2038+	Demolition and replacement of control tower	\$400M
Total Option 3 – Group 2			\$1.553B

OPTION 4

GROUP 1

New Terminal / Remote Pier	2023 - 2028	30,000m2 of new terminal space. 12 x Airbridges. Check-in / baggage / security upgrades Baggage reclaim extension.	\$342M
Domestic Terminal Capacity Upgrades	2023 - 2028	Bussing lounge extension. 2 x Airbridges.	\$106M
Airside Infrastructure	2023 - 2028	GSE parking / EV charging.	\$5M
Airside Parking and Fueling	2023 - 2028	89,000m2 of new apron with extension to fueling.	\$313M
Total Option 4 – Group 1			\$0.766B

OPTION 4

GROUP 2

Domestic Terminal Building Maintenance	2023 – 2038+	Terminal repairs and compliance.	\$67M
Regional Capacity Upgrade	2023 - 2028	Gate Lounge. Airside circulation. Baggage.	\$554M
	2028 - 2038	Baggage extension.	Inc above
	2038+	Gate lounge, retail and circulation.	Inc above
Airside Pavement and Fueling	2038+	43,000m ² of regional pavement. Demolition of 2 x aero sheds	\$250M
Landside – Curbside, Road and Forecourt Infrastructure	2023 – 2028	Carpark B (at grade). Road and forecourt (20,500m ²). 3 x intersections. Carpark Buildings A & C (2700 spaces).	\$670M
Landside – Control Tower	2038+	Demolition and replacement of control tower	\$400M
Total Option 4 – Group 2			\$1.941B

SUMMARY OF OPTIONS

	Option 1	Option 2	Option 3	Option 4
Group 1	\$1.187B	\$0.893B	\$0.841B	\$0.766B
Group 2	\$0.852B	\$1.537B	\$1.553B	\$1.941B
Total	\$2.039B	\$2.430B	\$2.394B	\$2.707B

ARUP