



Findings of Feasibility Study – AKL Domestic Terminal Options

Presentation to AIAL

31 October 2023

Introduction



This pack provides the final draft findings of a feasibility study on a short-list of alternative AKL domestic terminal options.

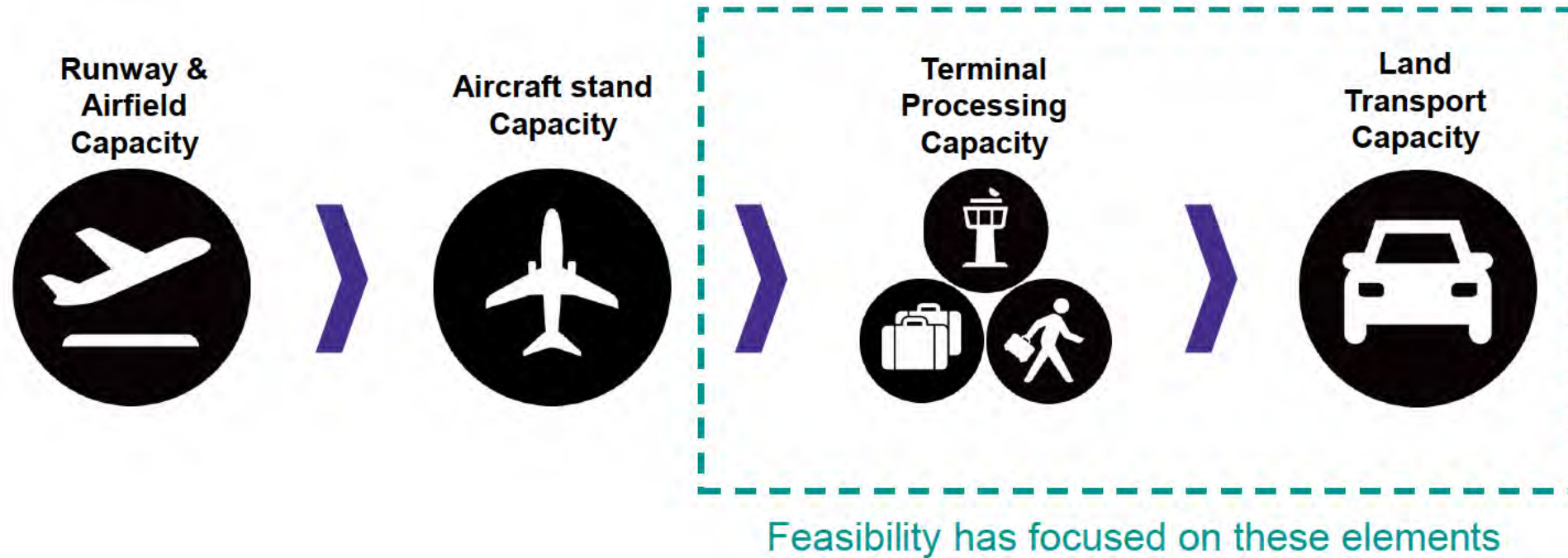
The Feasibility study:

- provides domestic terminal capacity to 2033 & 2043 forecast passenger demand (unconstrained).
- targets a P50 cost accuracy (i.e. 50% of projects achieve the cost estimate)
- includes inputs from Air NZ Airport Ops, Fight Ops, Aero Pricing (Procurement), CX and Property.

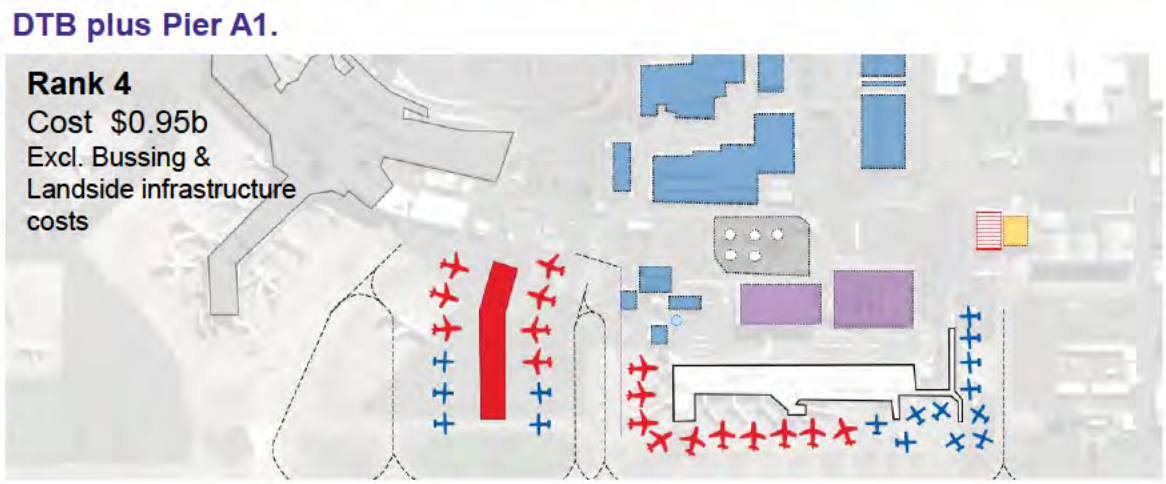
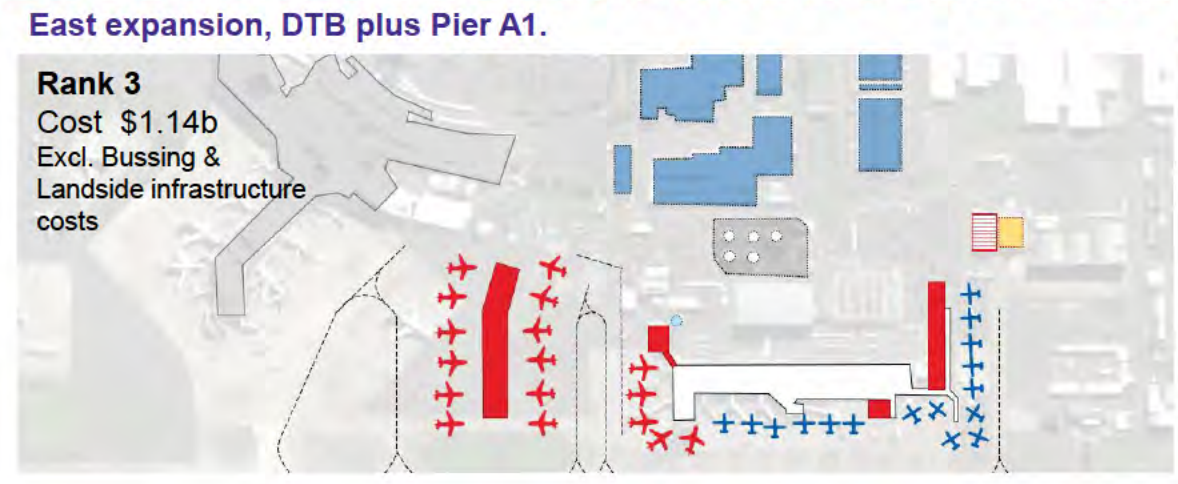
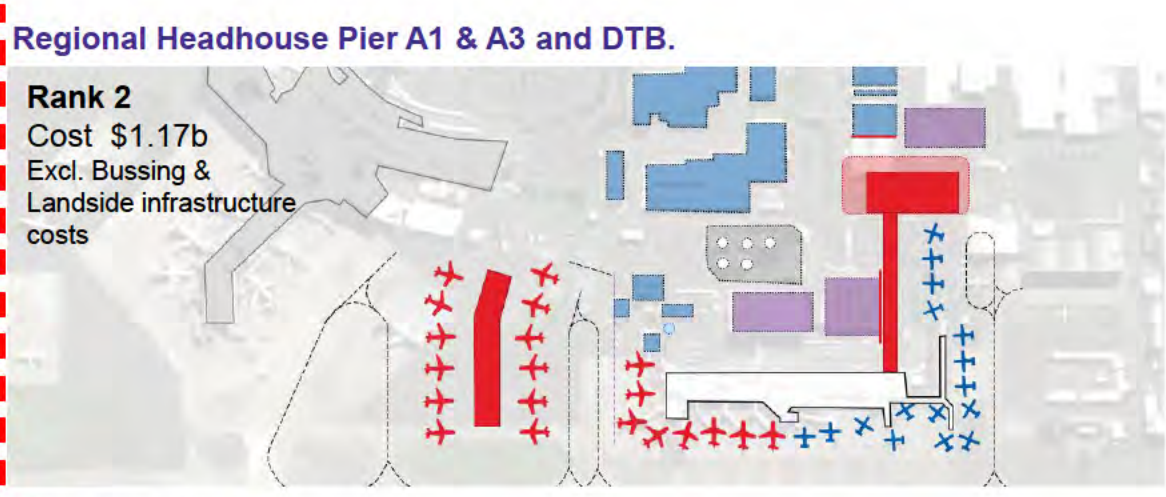
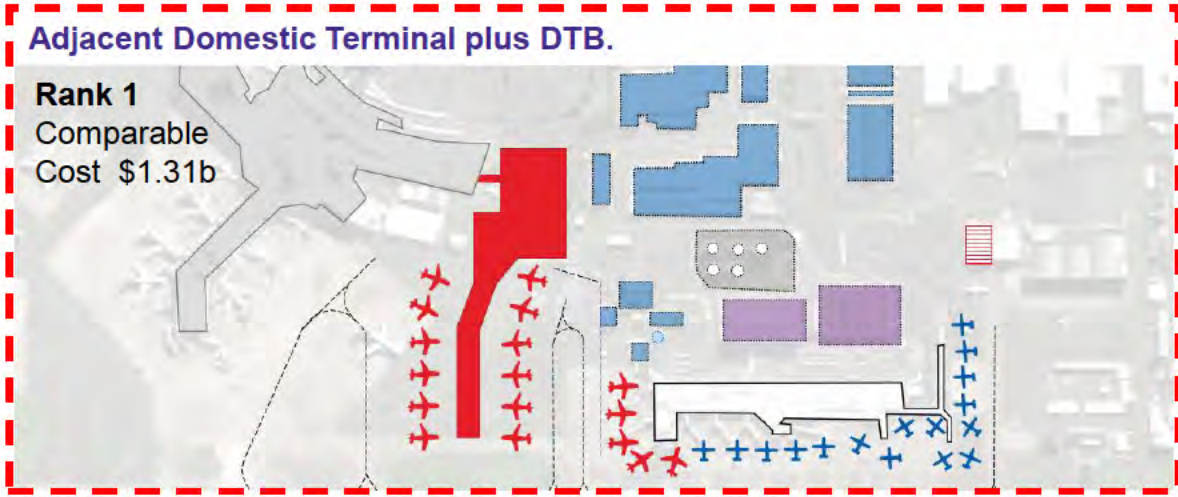


Alternative Domestic Terminal Options

We have applied a best practice approach matching demand to supply for each step in the airport system hierarchy



Feasibility of the shortlisted options has ranked the Adjacent DOM Terminal the highest with a cost of \$1.31b compared to AIALs IDT at \$2.2b



To enable a comparison with the AIAL IDT costs have been estimated for each shortlisted option



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

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

	Adjacent Dom Terminal	Eastern Expansion	DTB + Pier A1	Regional Headhouse
Cost estimate elements (Comparable)	Option 1	Option 2	Option 3	Option 4
Construction				
Terminal - New Build incl. expansion to DTB	█	█	█	█
Terminal - Internal re-configuration to DTB	█	█	█	█
Airside - Aviation infrastructure	█	█	█	█
Airside - Pavements and Fuelling (Domestic)	█	█	█	█
Total (A)	█	█	█	█
Planning, design and risk				
Consents, professional and management fees	█	█	█	█
Risk allowances	█	█	█	█
Total (B)	█	█	█	█
Cost estimate				
Total costs (A)+(B)	█	█	█	█
Escalation (C)	█	█	█	█
Cost estimate with escalation (A)+(B)+(C)	█	█	█	█

NB Bussing costs to and from Pier A1 have been estimated at \$6.7m for bus purchase & an annual operating cost of \$5.7m



Costing context, methodology and assumptions



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 includes the following cost provisions:

- Resource and Building Consents 2%
- Professional Fees 15%
- AIAL Management Costs 3.8%
- Risk Provisions through Design and Tender 10%
- Risk Provision through Construction 10%
- General Project Risk Provision 5%

Costs have been escalated to the mid-point of the corresponding development programme (i.e. 2023-2028 costs escalated to 2026) using forecast escalation rates of between 2.5-4% per annum.

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

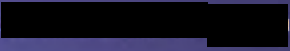
- 2023- 2028
- 2028-2038
- 2038+

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.



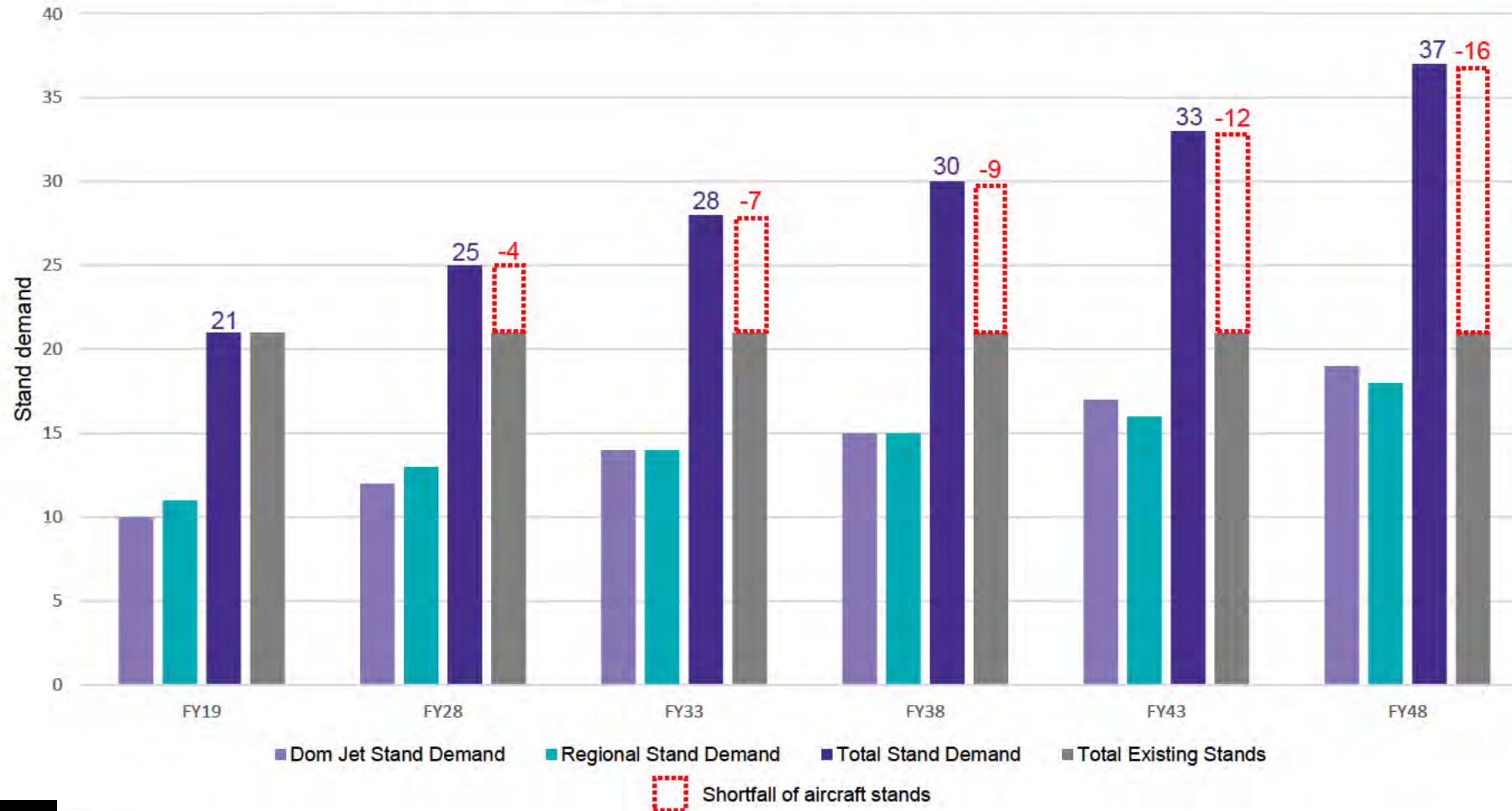
Airside



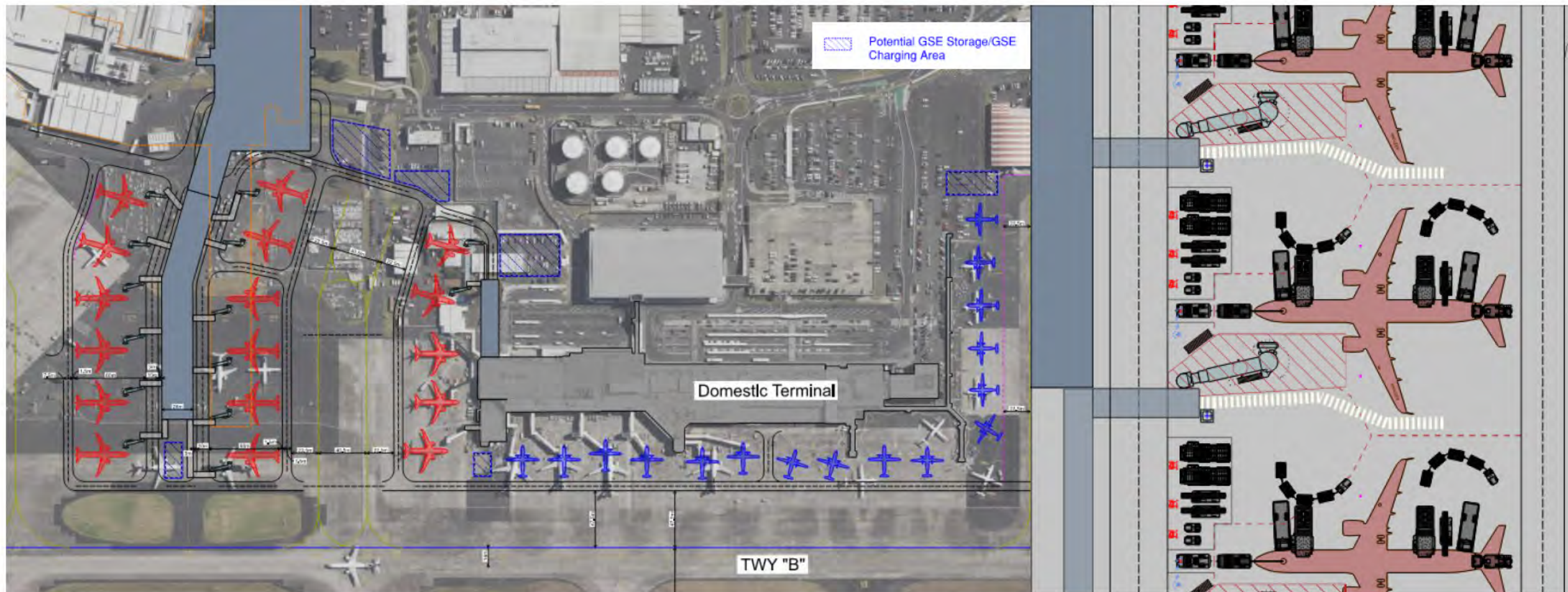
Airfield layouts have been driven by demand for aircraft stands to 2043, and efficient airfield operations



Forecast AKL Domestic and Regional Stand Demand & Shortfall

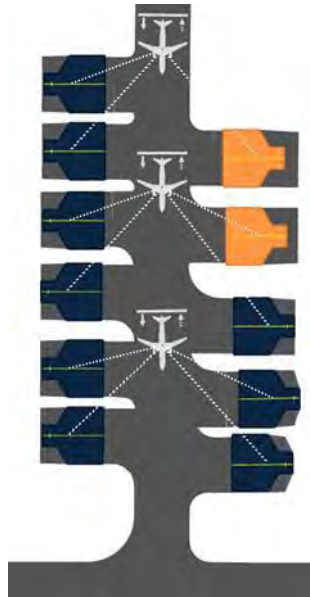


Airside Planning has included a dual taxilane and aircraft stand layouts

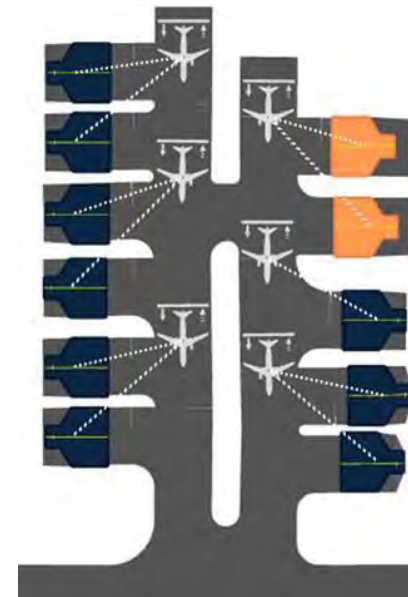


Single & dual taxilanes have been simulated in a CAST model to understand the levels of delay

Scenario 1: AIAL's Integrated Domestic Terminal (IDT) pier arrangement with single Code C taxilane



Scenario 2: An alternative pier arrangement with dual Code C taxilane



Diagrams show start-up locations assumed in the model. DKMA's DDFS has been used to model delay

A single taxilane doubles the delay for aircraft using the eastern side of Pier A1

2033

Overall	Single taxilane	Dual taxilane
Average taxi-in delay (sec)	2	1
Average taxi-out delay (sec)	38	16
Number of arrivals	206	
Number of departures	206	
Taxi-in delay yearly (hours)	42	21
Taxi-out delay yearly (hours)	794	334
Estimated % of aircraft with no taxi-in delays	95.1%	96.6%
Estimated % of aircraft with no taxi-out delays	71.2%	73.2%

2043

Overall	Single taxilane	Dual taxilane
Average taxi-in delay (sec)	3	2
Average taxi-out delay (sec)	41	20
Number of arrivals	229	
Number of departures	229	
Taxi-in delay yearly (hours)	70	46
Taxi-out delay yearly (hours)	952	464
Estimated % of aircraft with no taxi-in delays	95.1%	95.8%
Estimated % of aircraft with no taxi-out delays	72.8%	69.4%

Based on AIAL's previous airfield modelling, the stand delays add to the overall airfield system delay

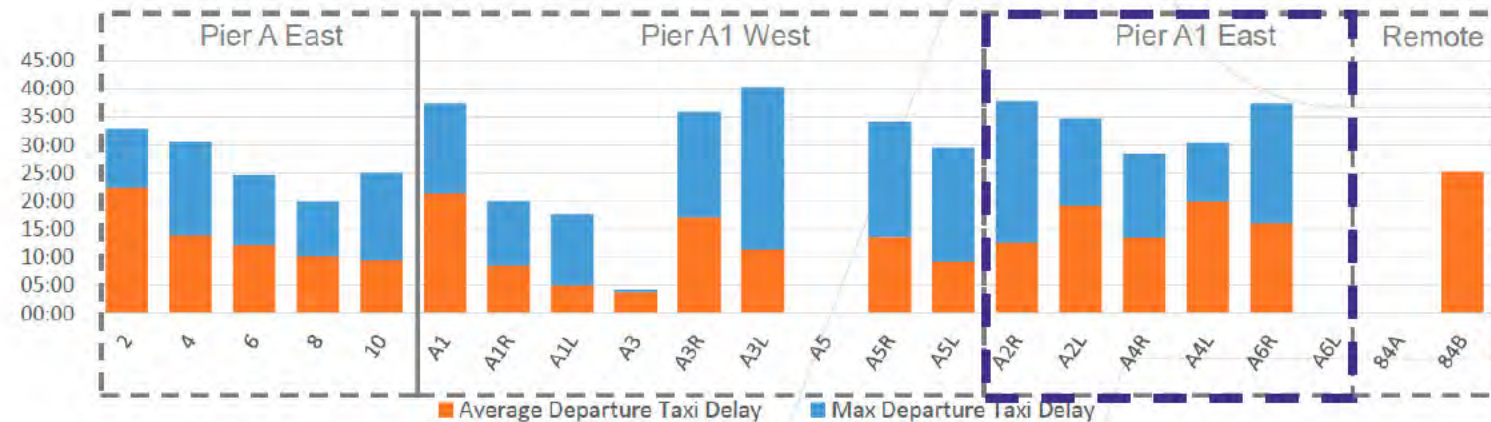
AIAL Material

Pier A East to Pier A1 West Ground Delays

Departure Taxi Delays (Taxi + Runway Queue):

- The following figure shows both the average and maximum departure delays between Pier A East and Pier A1 East stands, e.g. aircraft departing from Stand A3L experienced an average delay of 11:24 minutes and a maximum delay of 40:16 minutes caused by departure runway queuing in the evening peak.
- These figures are representative of **1 simulation only** and will differ based on the aircraft gate allocation, taxiway routes and flight schedule used during the simulation.

Departure Delay per Stand



Next steps – model delay for the taxilanes at an airfield system level to understand total system delay in 2033 and 2043

Adjacent Domestic Terminal (2043)



Rank 1

Design Year 2043

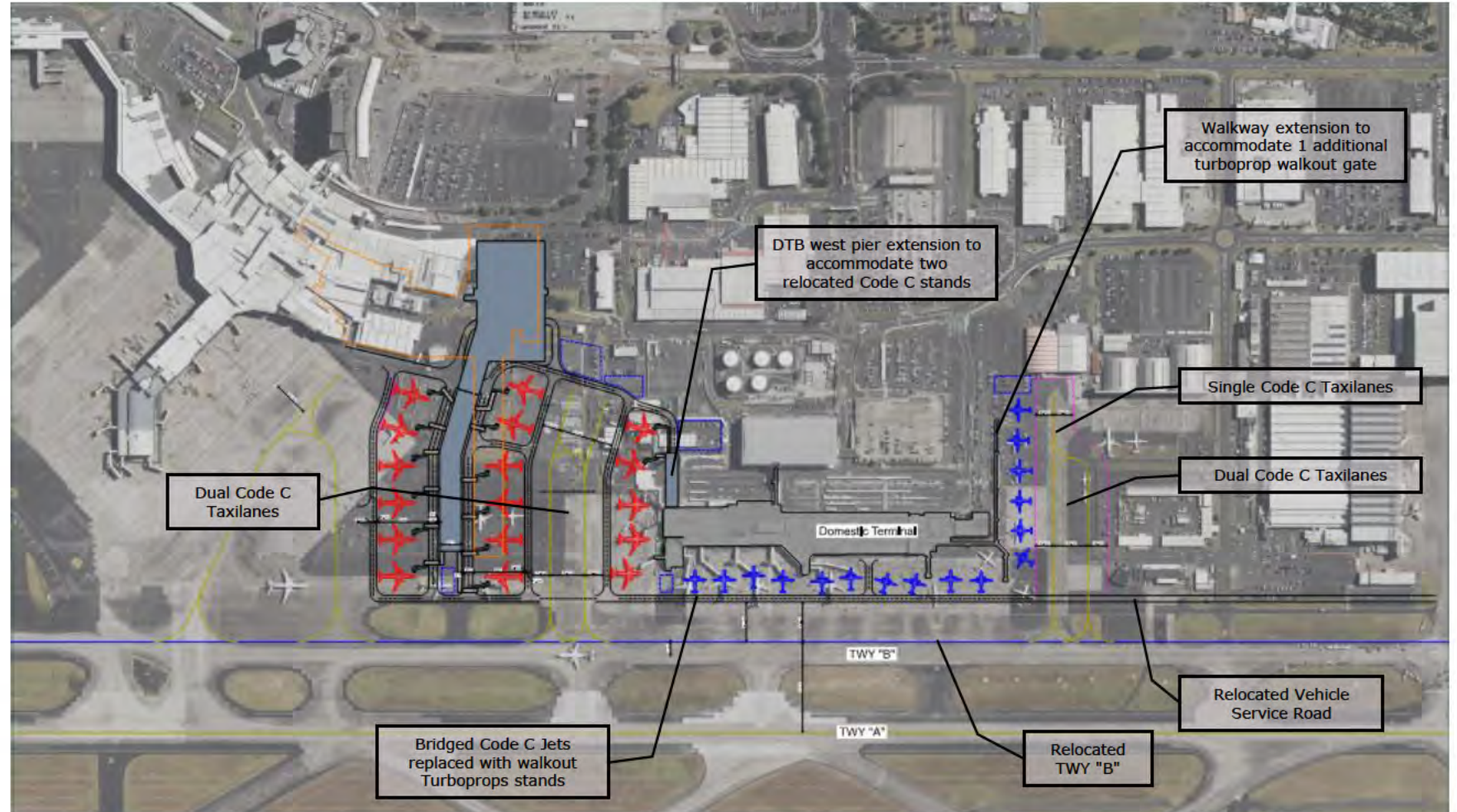
17 Code C Jets

16 Turboprops

Evaluation

Landside	5
Terminal	5
Airside	4
Pax experience	4
Runway	3
Feasibility	4
Ops Impact	5

TOTAL 30



Regional headhouse, Pier A3 & A1, DTB (2043)



Rank 2

Design Year - 2043

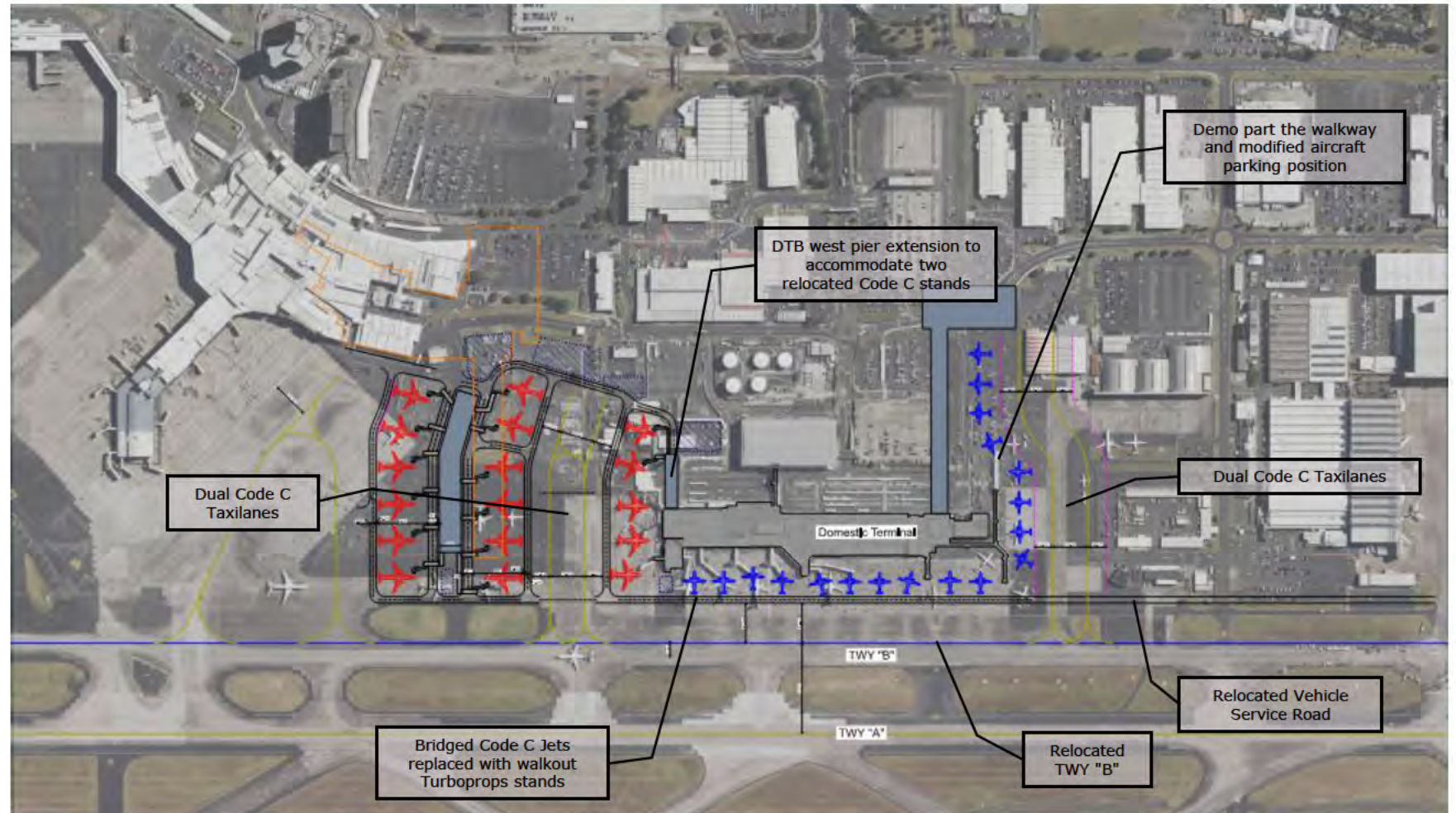
17 Code C Jets

18 Turboprops

Evaluation

Landside	3
Terminal	5
Airside	5
Pax experience	2
Runway	4
Feasibility	3
Ops Impact	2

TOTAL 24



East expansion, Pier A1 & DTB (2043)



Rank 3

Design Year - 2043

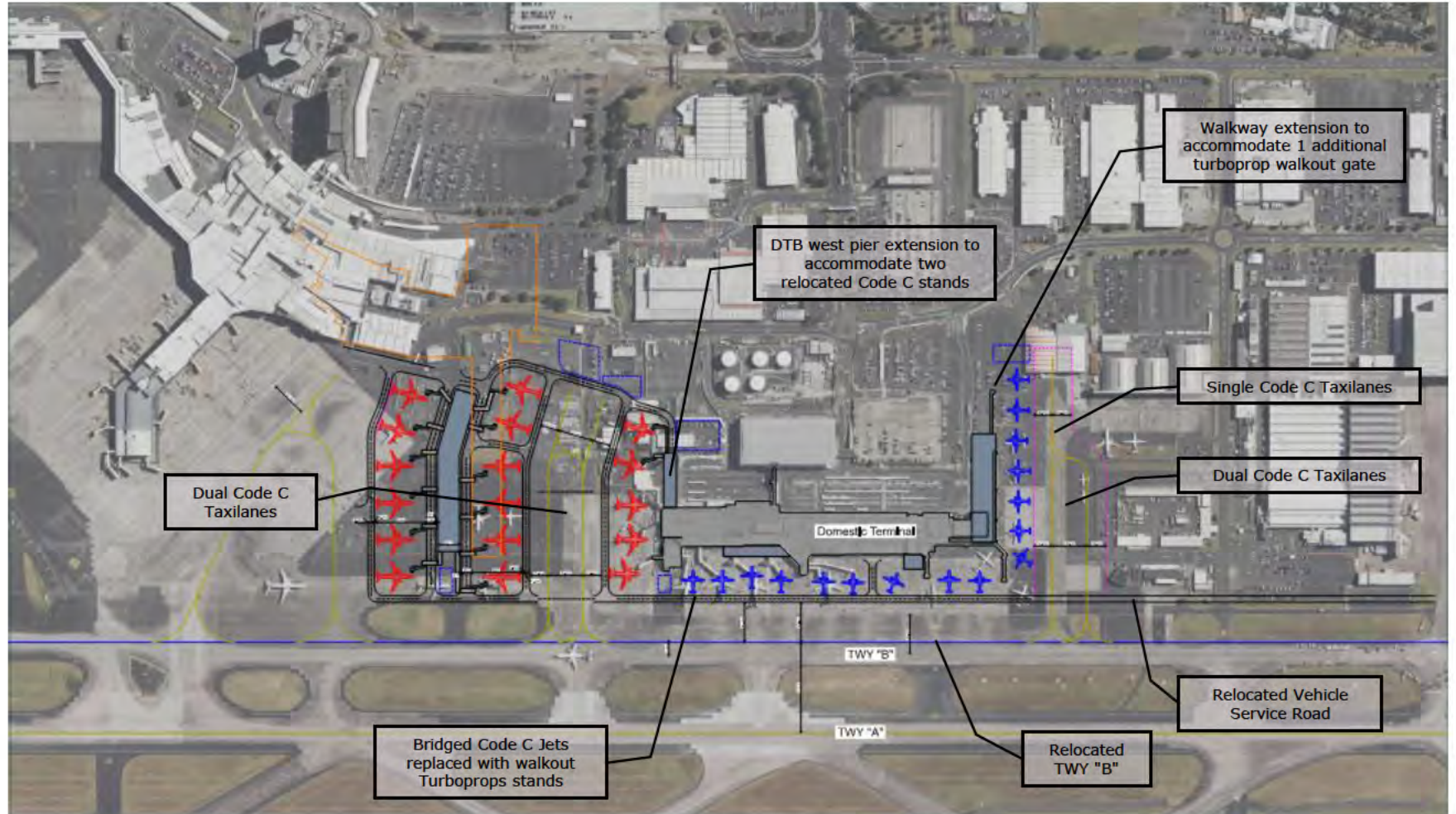
17 Code C Jets

16 Turboprops

Evaluation

Landside	2
Terminal	4
Airside	4
Pax experience	2
Runway	4
Feasibility	2
Ops Impact	2

TOTAL 20



DTB & Pier A1 (2043)



Rank 4

Design Year - 2043

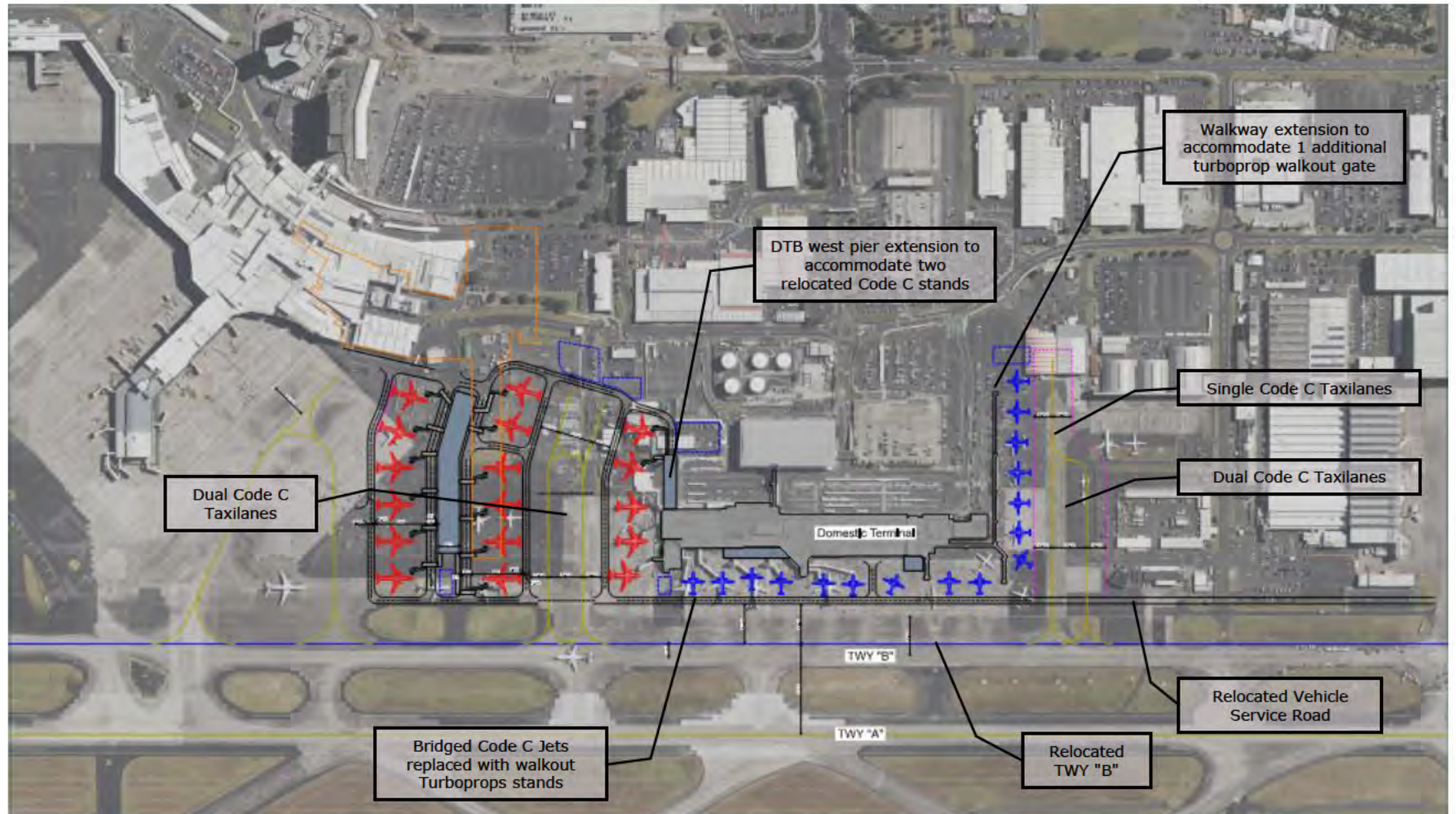
17 Code C Jets

16 Turboprops

Evaluation

Landside	2
Terminal	2
Airside	4
Pax experience	2
Runway	3
Feasibility	3
Ops Impact	1

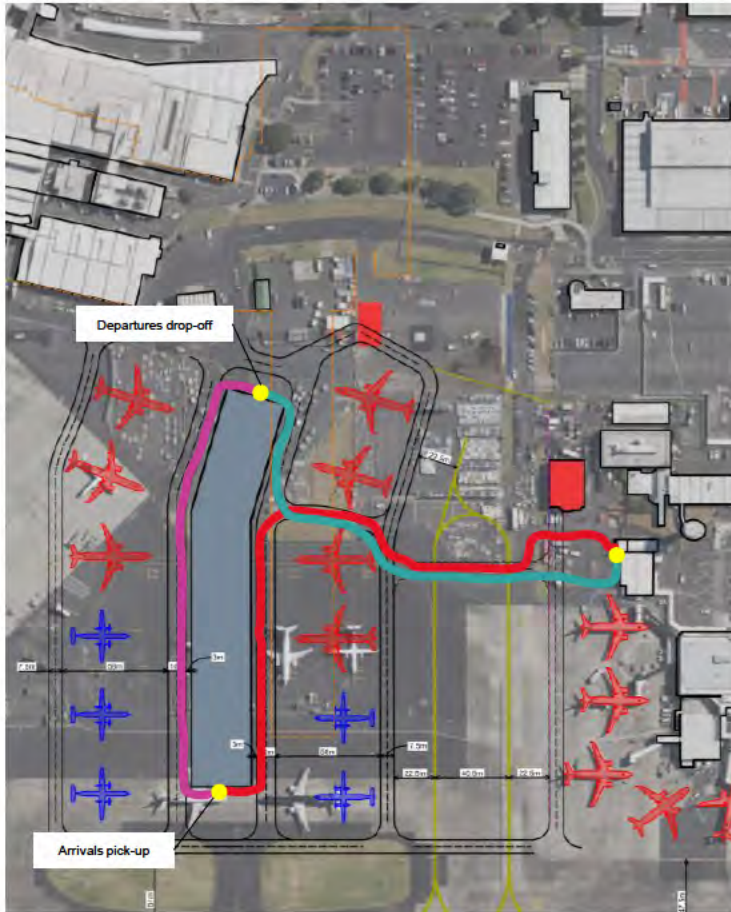
TOTAL 17



Remote Pier A1 requires bussing, which impacts CX and the operation for all options except Adjacent Domestic Terminal



7-9 simultaneously-operating buses to serve the 2043 busy hour; 1 bus every 3 mins; peak hr PAX: 1097 DEP / 1033 ARR



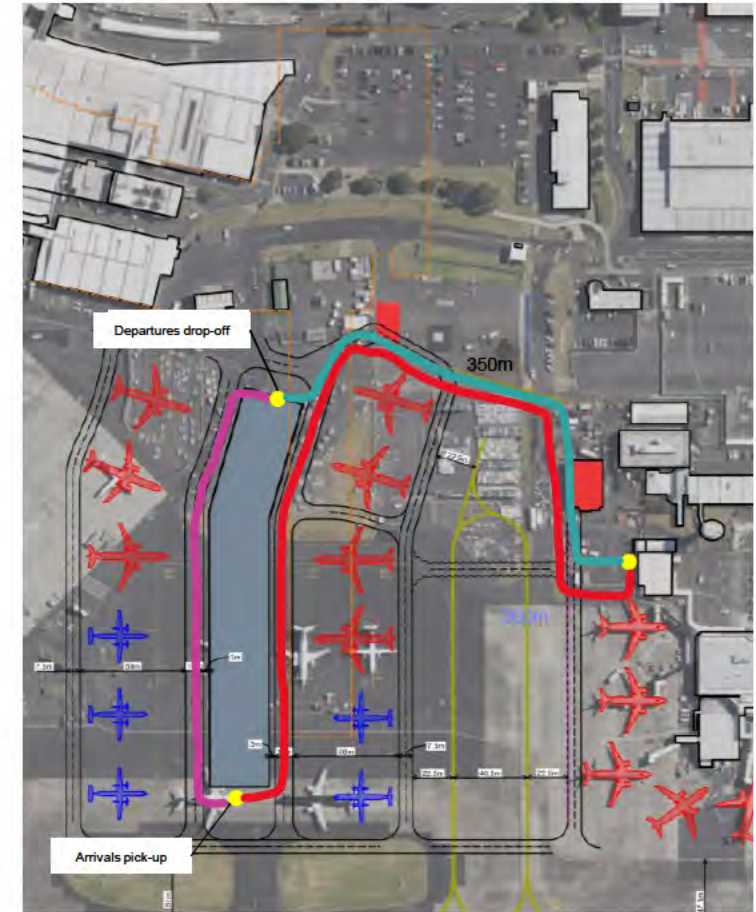
Route A

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



Route B

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



Route C

Lowest interaction on apron.
Assumed bus delay: 1 min

The difference to the existing MCT has been calculated for each option. The Adjacent Domestic Terminal achieves a reduced MCT D-I / I-D.



Minimum Connection Time	Existing MCT (mins)	Adjacent Domestic Terminal	Regional Headhouse	Eastern expansion	DTB & Pier A1
INT - DOM	80	-8	+7	+7	+7
DOM - INT	42	-12	+7	+7	+7
DOM - REG	18	+15	+11	+9	+7
REG - DOM	18	+16	+11	+9	+7
INT - REG	88	0	+4	+1	0
REG - INT	44	0	+4	+2	0

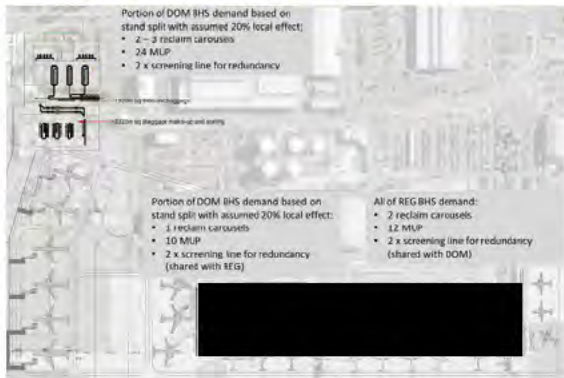


Terminal



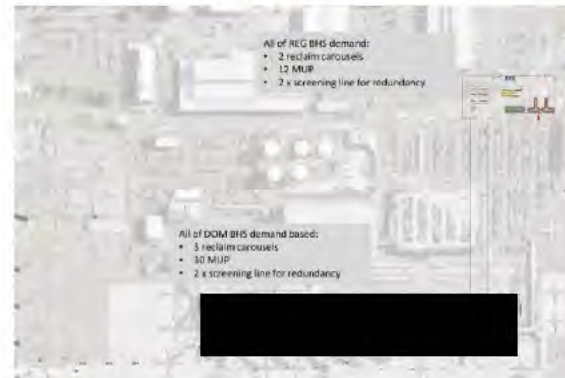
Terminal layouts have been created for each option to test the programme of requirements.

Adjacent Domestic Terminal



- Adequate space for BHS facilities
- Generally efficient apron operation
- DTB will have spare baggage capacity
- Split baggage operation adds operational cost

Regional Headhouse



- Considered the most practical of the options from a baggage perspective
- Split baggage operation adds operational cost
- BHS space is good with both Domestic and Regional

Eastern Expansion



- Workable, but either space for check-in or baggage make-up will be constrained
- Requires multiple locations for handling

DTB & Pier A1



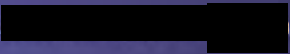
- Unlikely to have enough baggage capacity
- Aome sort of remote baggage operation in Pier A1 would likely be needed to provide sufficient space for baggage facilities
- Requires multiple locations for handling

NB Baggage has been assessed by BNP Associates

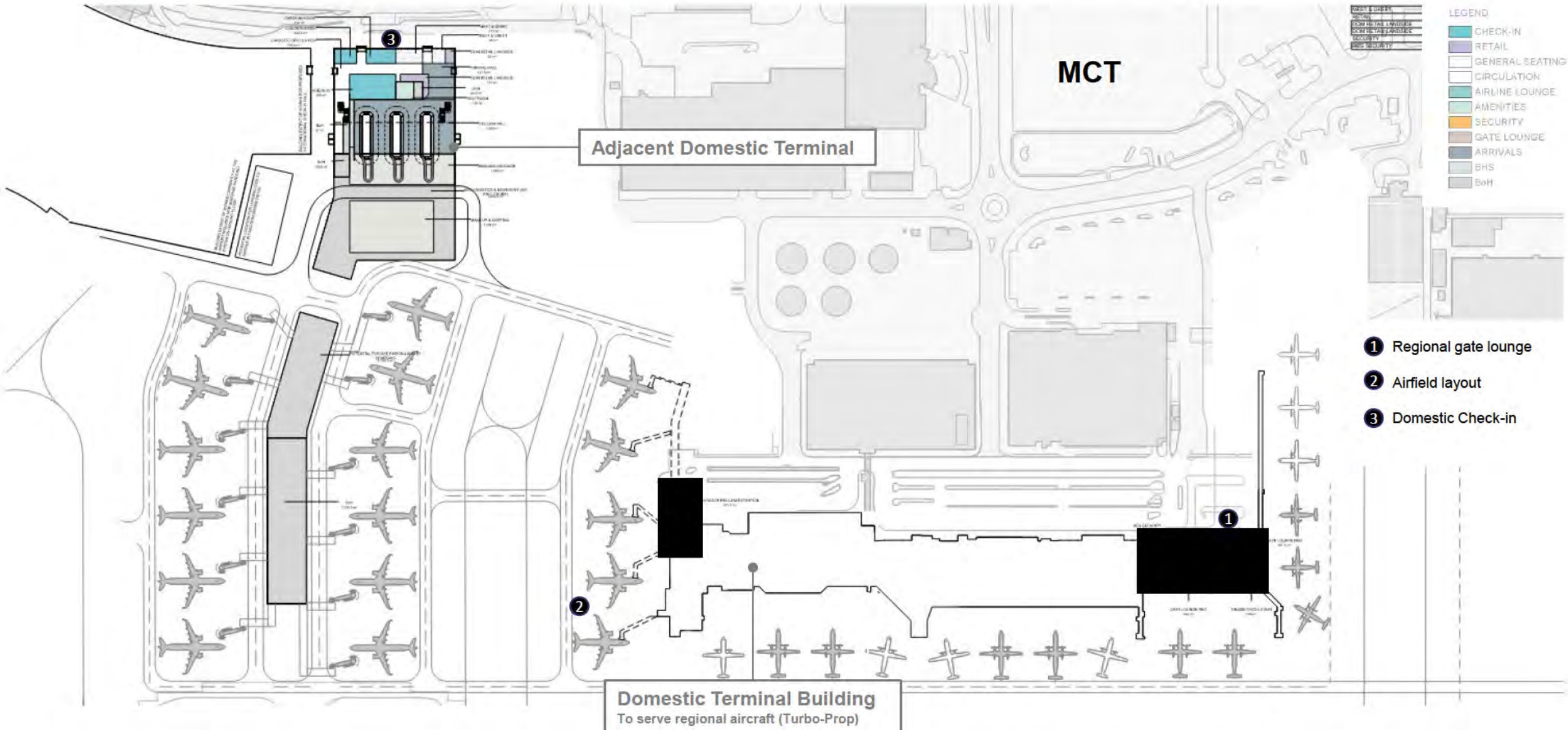


Adjacent Domestic Terminal

Option 1 – rank 1



Adjacent Domestic - level 0 (rank 1)

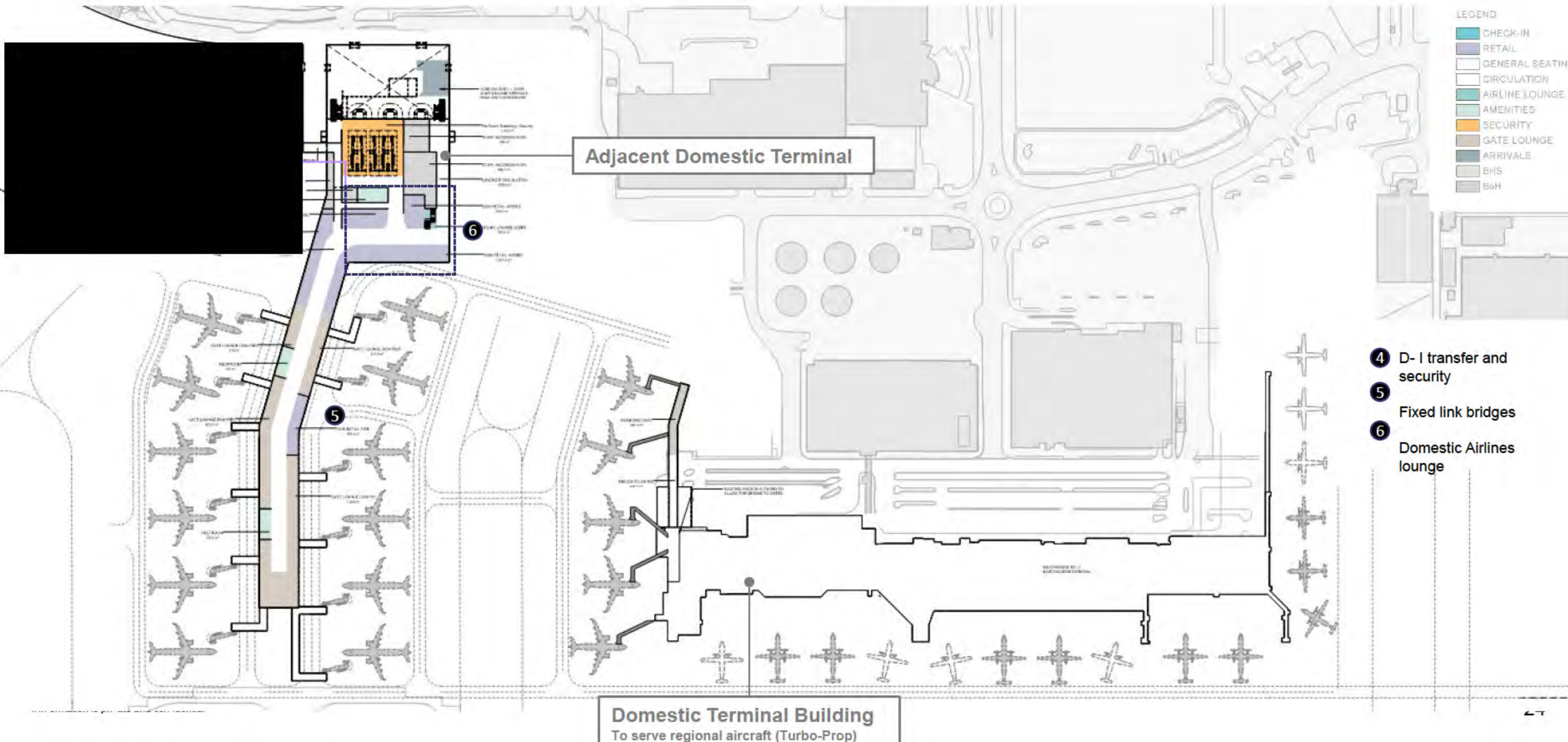


Adjacent Domestic - level 1

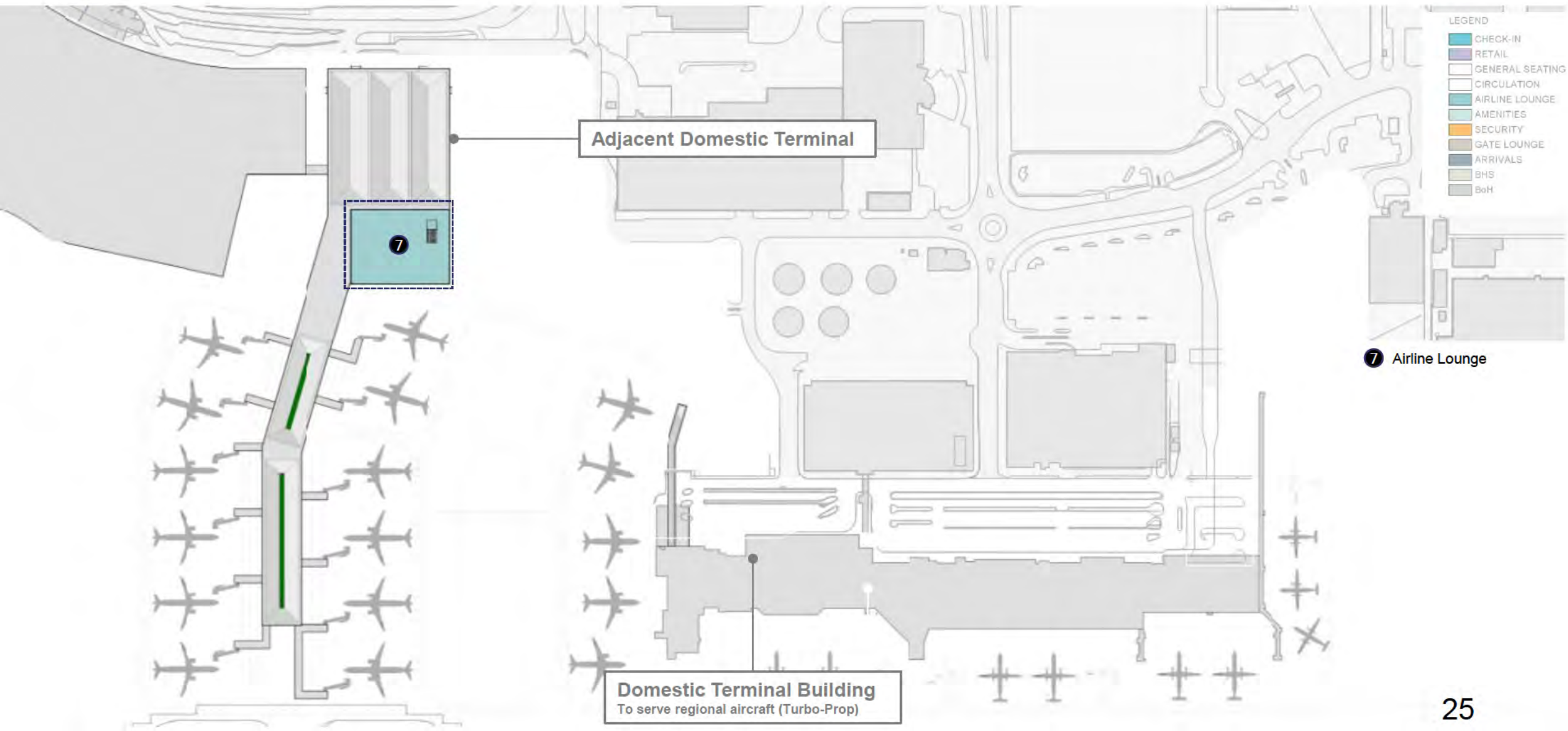


LEGEND

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



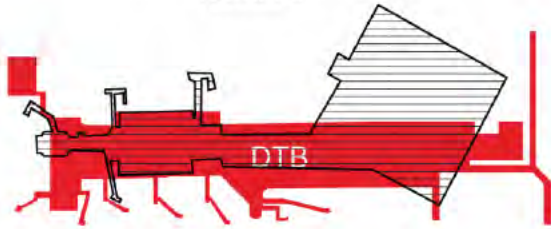
Adjacent Domestic - level 2



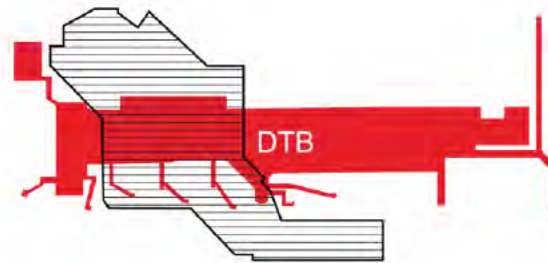
The Adjacent Domestic Terminal has been benchmarked



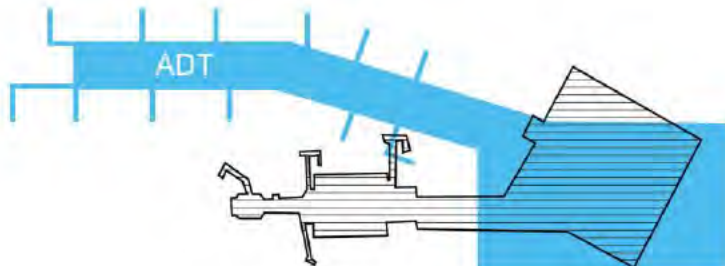
WLG
Wellington Domestic
Terminal



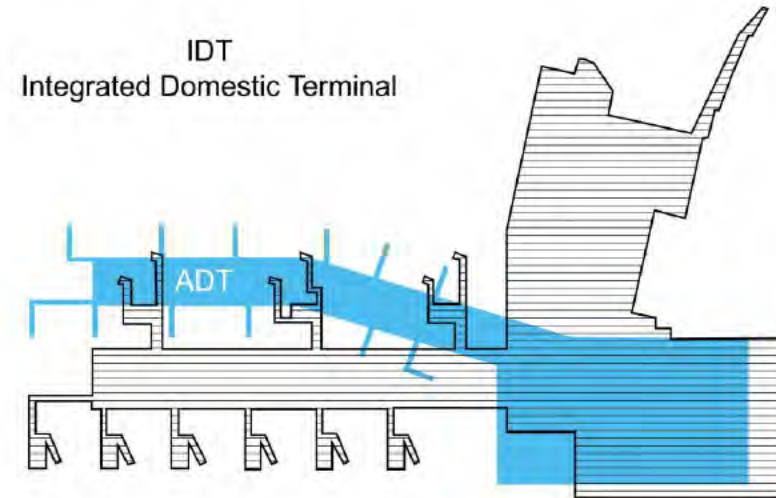
CHC
Christchurch Domestic Terminal



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

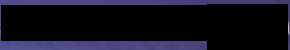


Note, Pier A1 for ADT and IDT have 12 stands



Regional Headhouse, Pier A1 & A3 and DTB

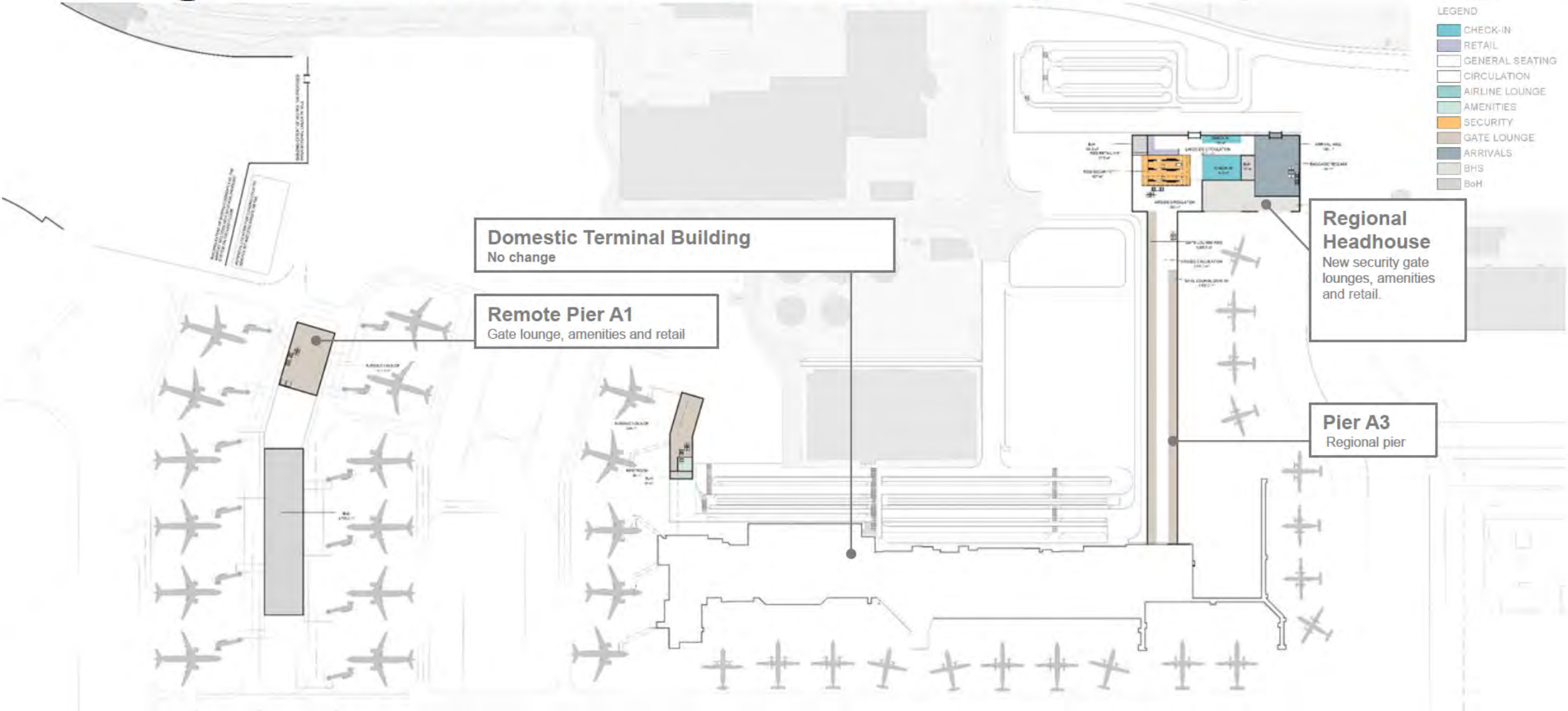
Option 4 – rank 2



Regional headhouse - level 0 (rank 2)



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



Domestic Terminal Building
No change

Remote Pier A1
Gate lounge, amenities and retail

Regional Headhouse
New security gate lounges, amenities and retail.

Pier A3
Regional pier

Regional headhouse - level 1



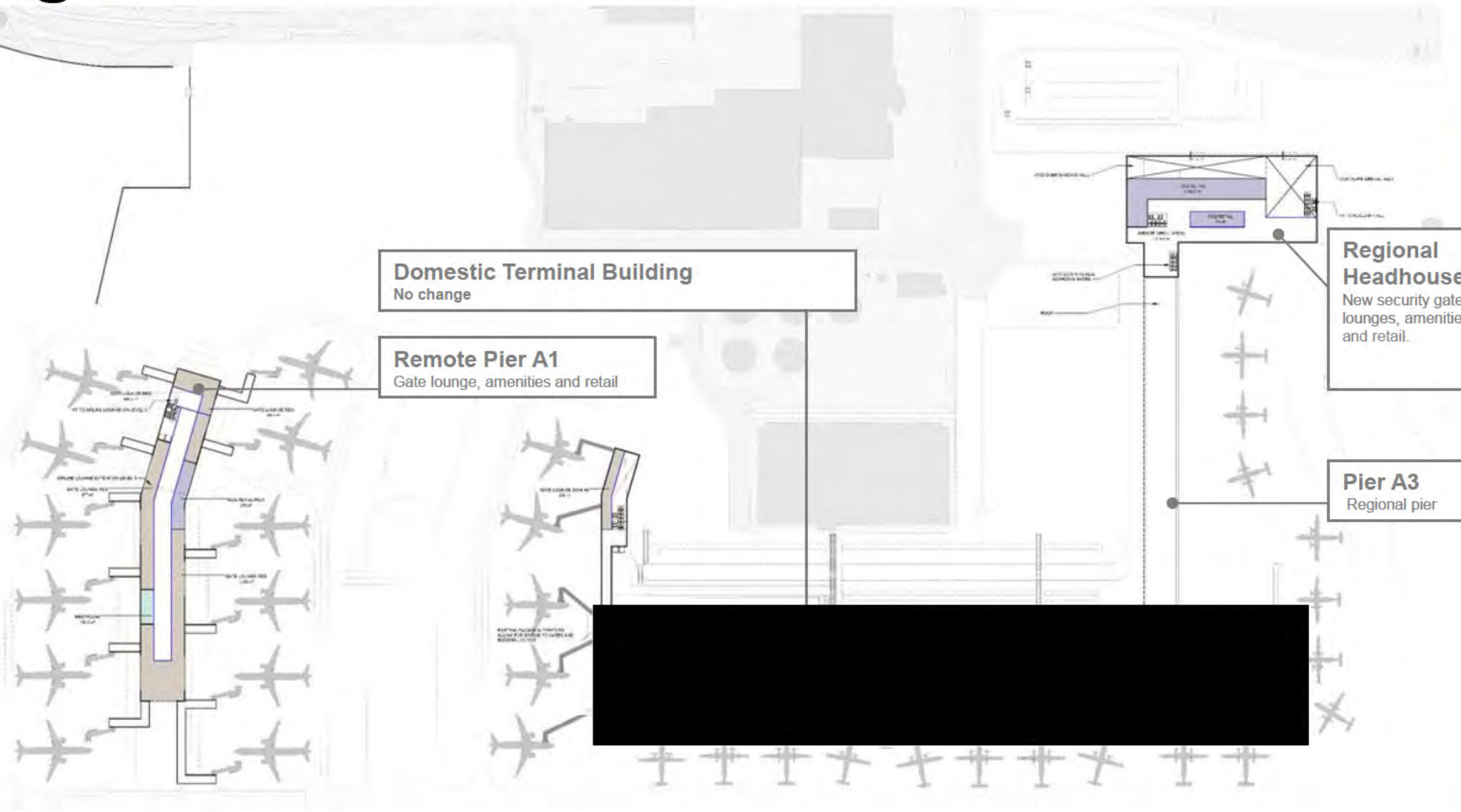
- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

Domestic Terminal Building
No change

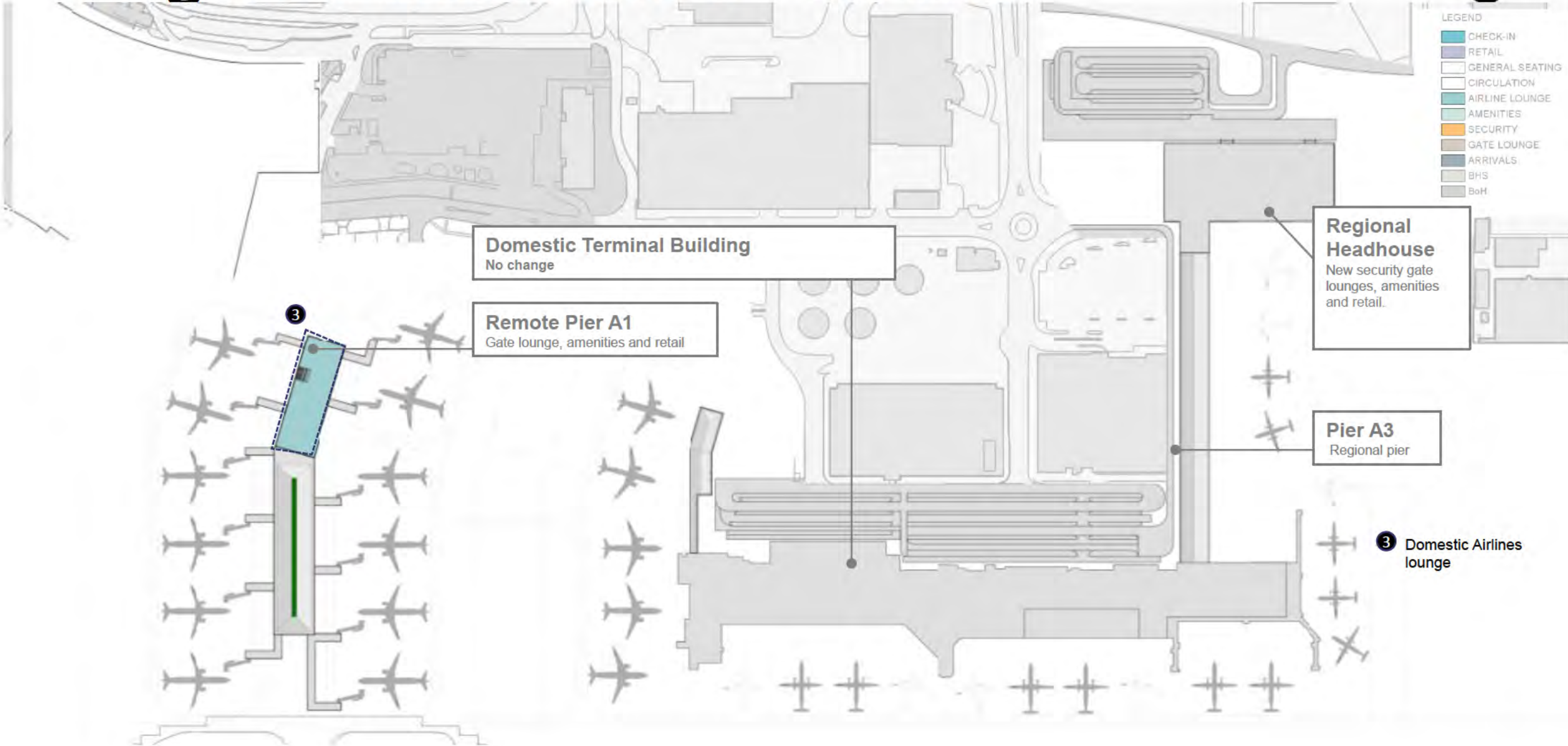
Remote Pier A1
Gate lounge, amenities and retail

Regional Headhouse
New security gate lounges, amenities and retail.

Pier A3
Regional pier



Regional Headhouse - level 2



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

Domestic Terminal Building
No change

Remote Pier A1
Gate lounge, amenities and retail

Regional Headhouse
New security gate lounges, amenities and retail.

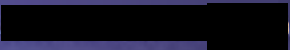
Pier A3
Regional pier

3 Domestic Airlines lounge



East Expansion, DTB & Pier A1

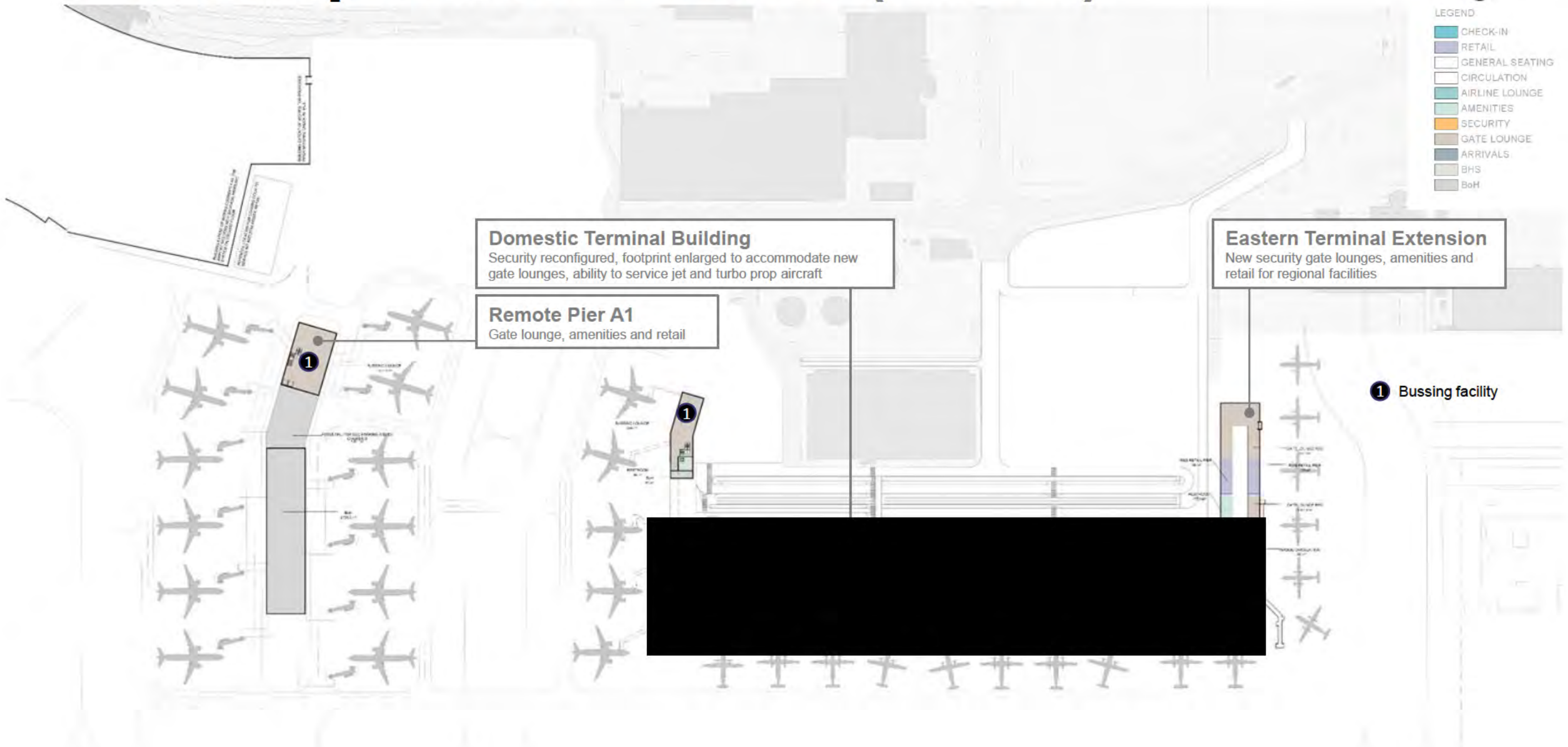
Option 2 – rank 3



East Expansion - level 0 (rank 3)



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



East Expansion - level 1

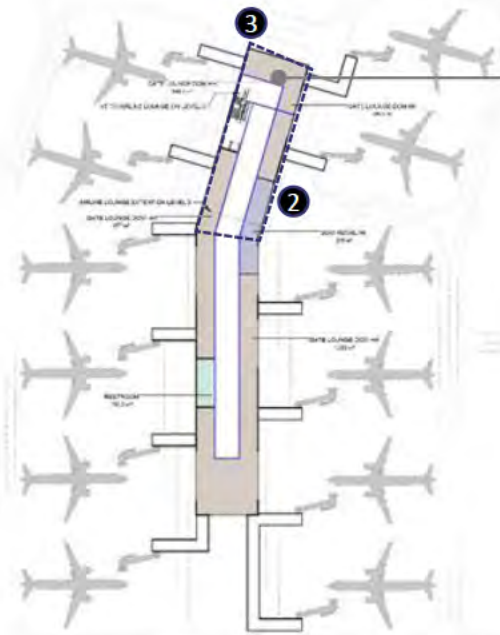


- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

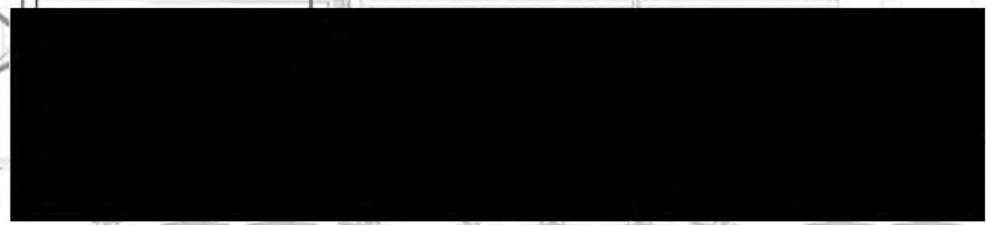
Domestic Terminal Building
Security reconfigured, footprint enlarged to accommodate new gate lounges, ability to service jet and turbo prop aircraft

Remote Pier A1
Gate lounge, amenities and retail

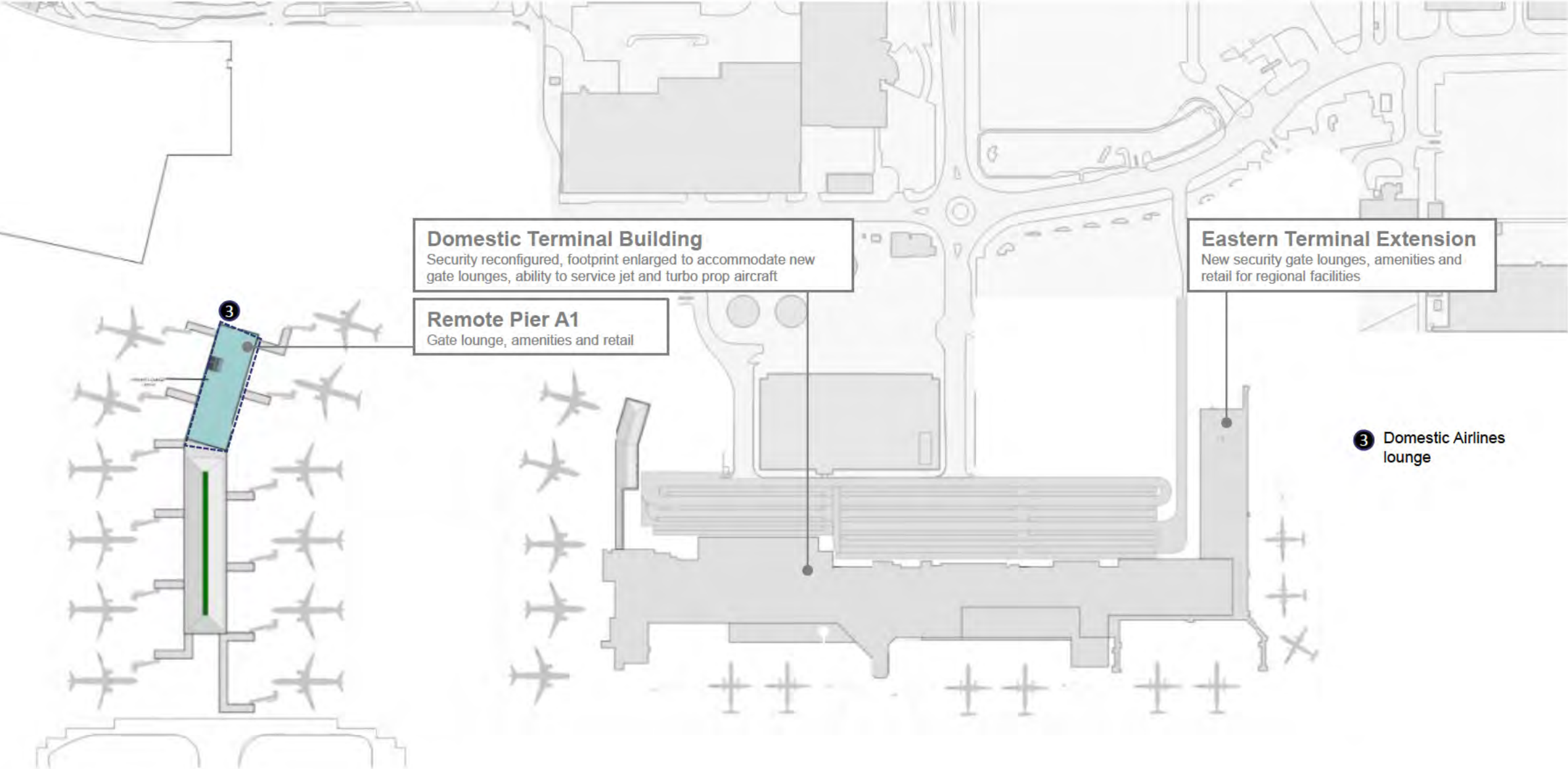
Eastern Terminal Extension
New security gate lounges, amenities and retail for regional facilities



- 2 Fixed link bridges
- 3 Domestic Airlines lounge



East Expansion - level 2



Domestic Terminal Building
Security reconfigured, footprint enlarged to accommodate new gate lounges, ability to service jet and turbo prop aircraft

Remote Pier A1
Gate lounge, amenities and retail

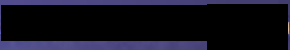
Eastern Terminal Extension
New security gate lounges, amenities and retail for regional facilities

3 Domestic Airlines lounge



DTB & Pier A1

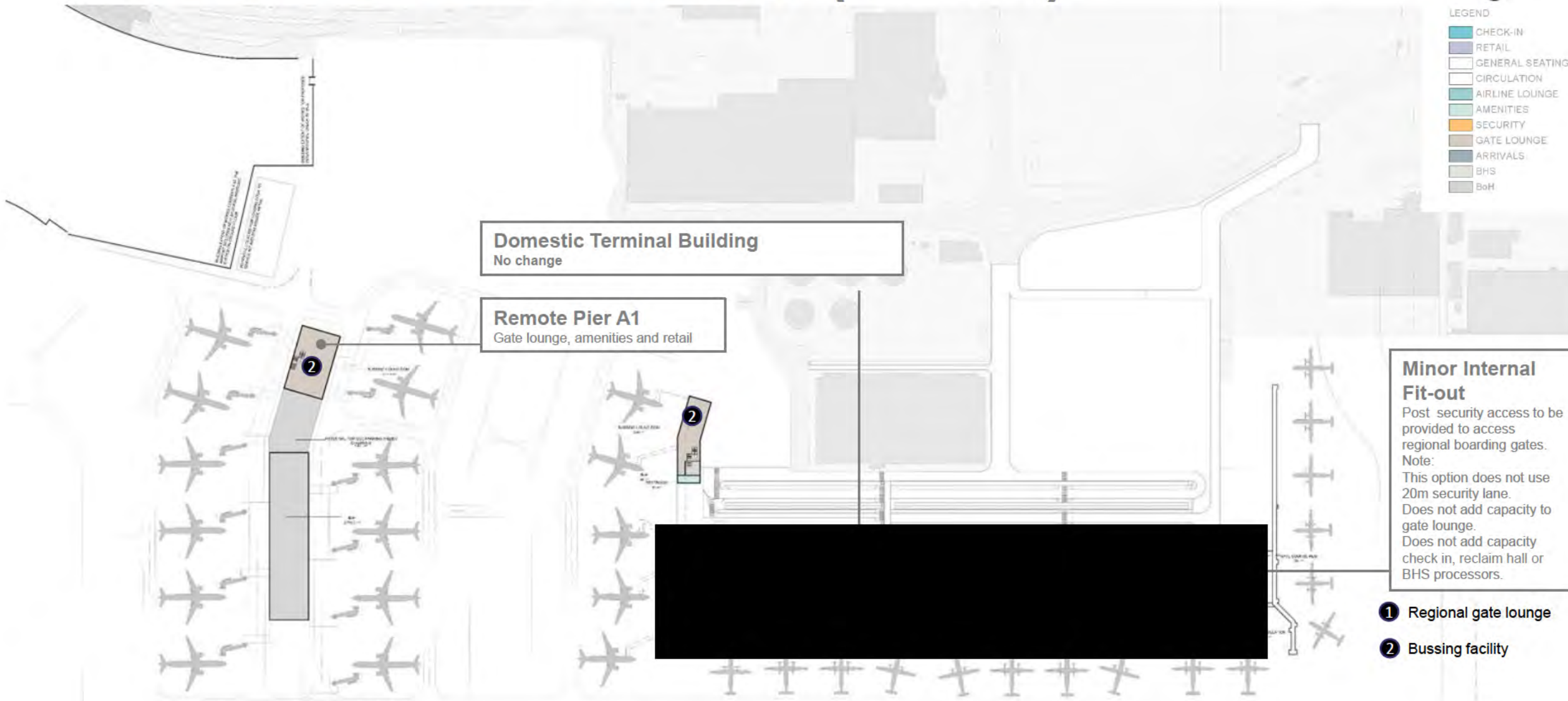
Option 3 – rank 4



DTB & Pier A1 - level 0 (rank 4)



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



Domestic Terminal Building
No change

Remote Pier A1
Gate lounge, amenities and retail

Minor Internal Fit-out
Post security access to be provided to access regional boarding gates.
Note:
This option does not use 20m security lane.
Does not add capacity to gate lounge.
Does not add capacity check in, reclaim hall or BHS processors.

- 1 Regional gate lounge
- 2 Bussing facility

DTB & Pier A1 - level 1

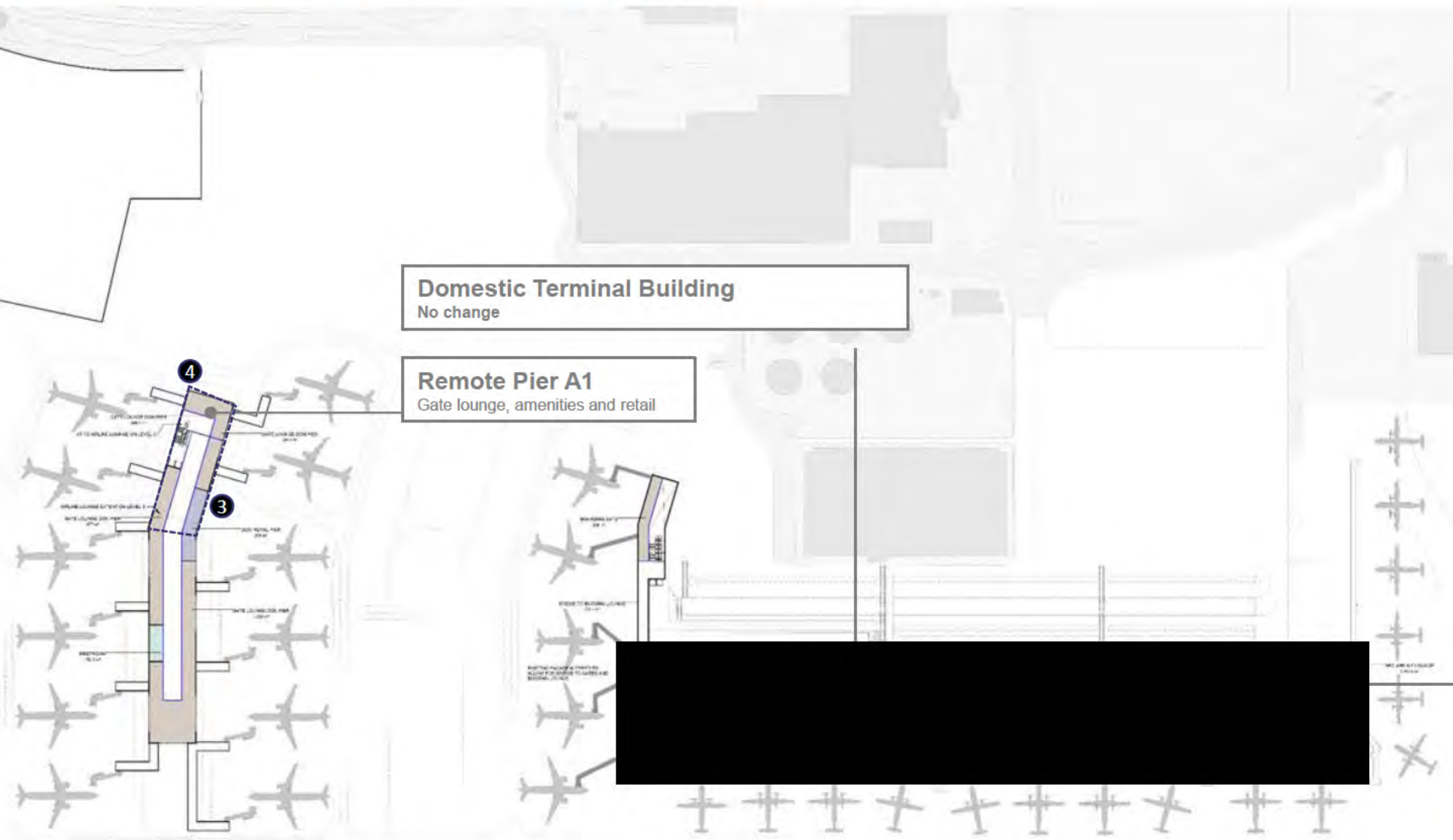


- LEGEND
- CHECK-IN
 - RETAIL
 - GENERAL SEATING
 - CIRCULATION
 - AIRLINE LOUNGE
 - AMENITIES
 - SECURITY
 - GATE LOUNGE
 - ARRIVALS
 - BHS
 - BoH

Domestic Terminal Building
No change

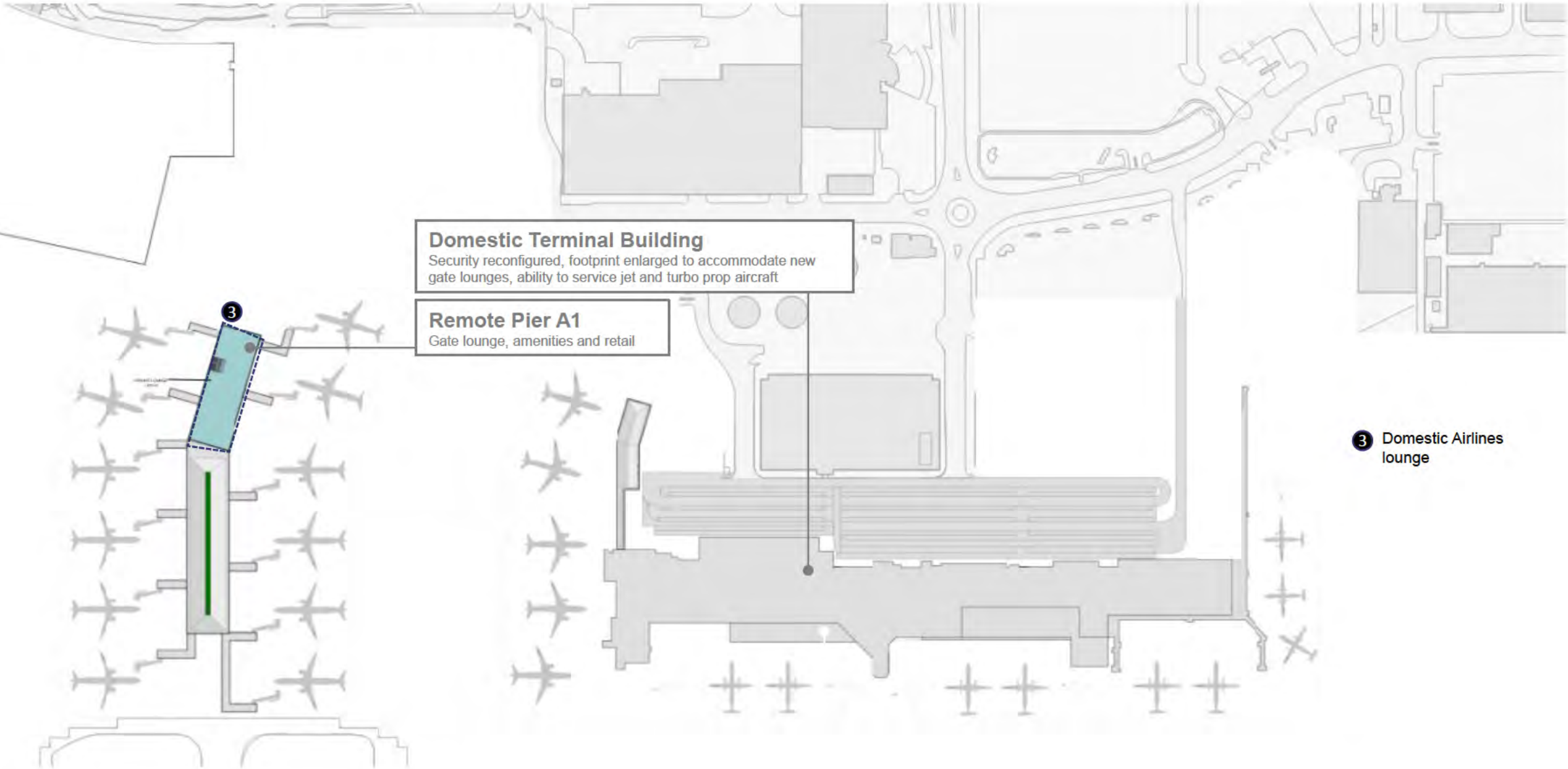
Remote Pier A1
Gate lounge, amenities and retail

Minor Internal Fit-out
Post security access to be provided to access regional boarding gates.
Note:
This option does not use 20m security lane.
Does not add capacity to gate lounge.
Does not add capacity check in, reclaim hall or BHS processors.



- 3** Fixed link bridges
- 4** Domestic Airlines lounge

DTB & Pier A1 - level 2



Domestic Terminal Building
Security reconfigured, footprint enlarged to accommodate new gate lounges, ability to service jet and turbo prop aircraft

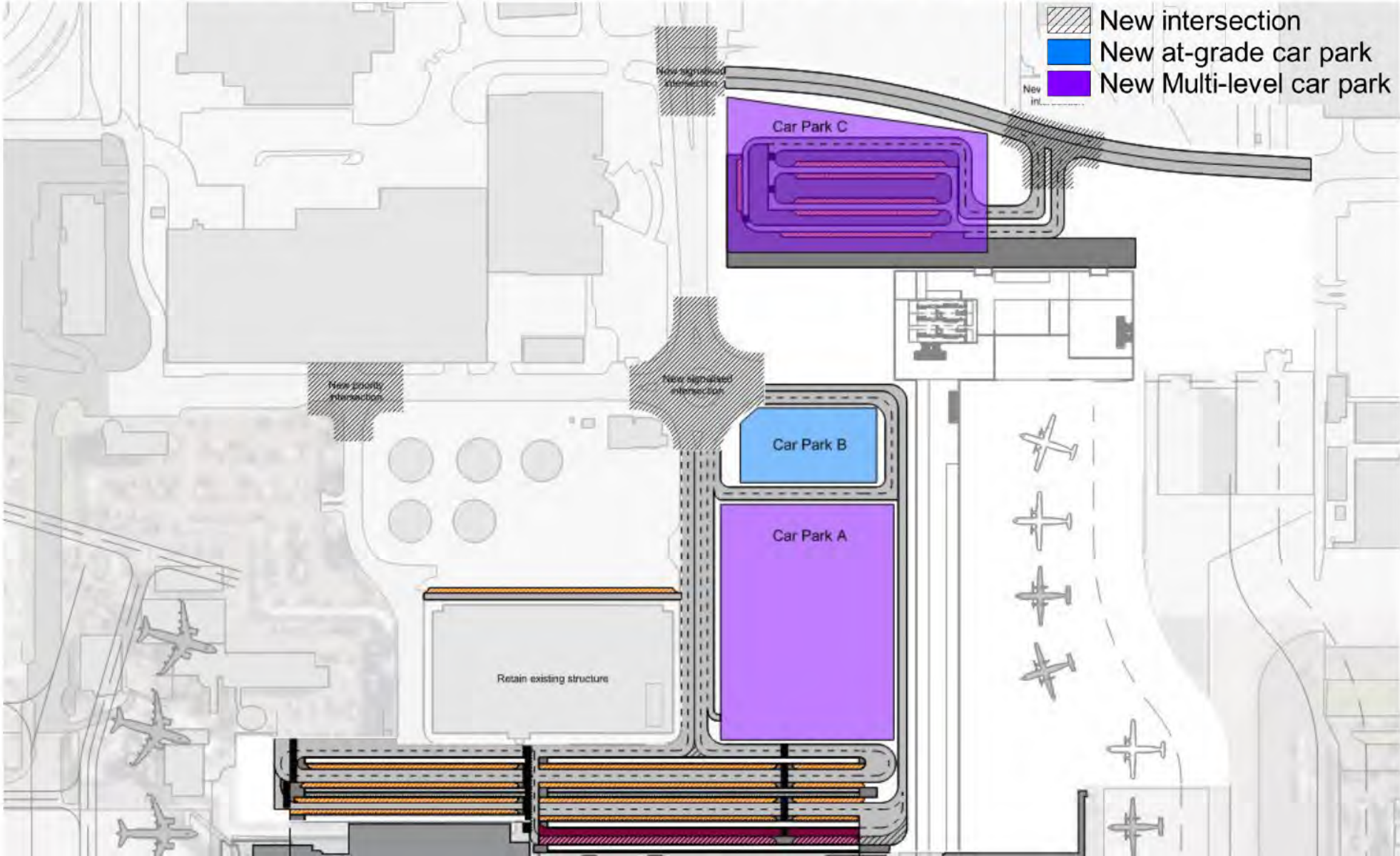
Remote Pier A1
Gate lounge, amenities and retail

3 Domestic Airlines lounge

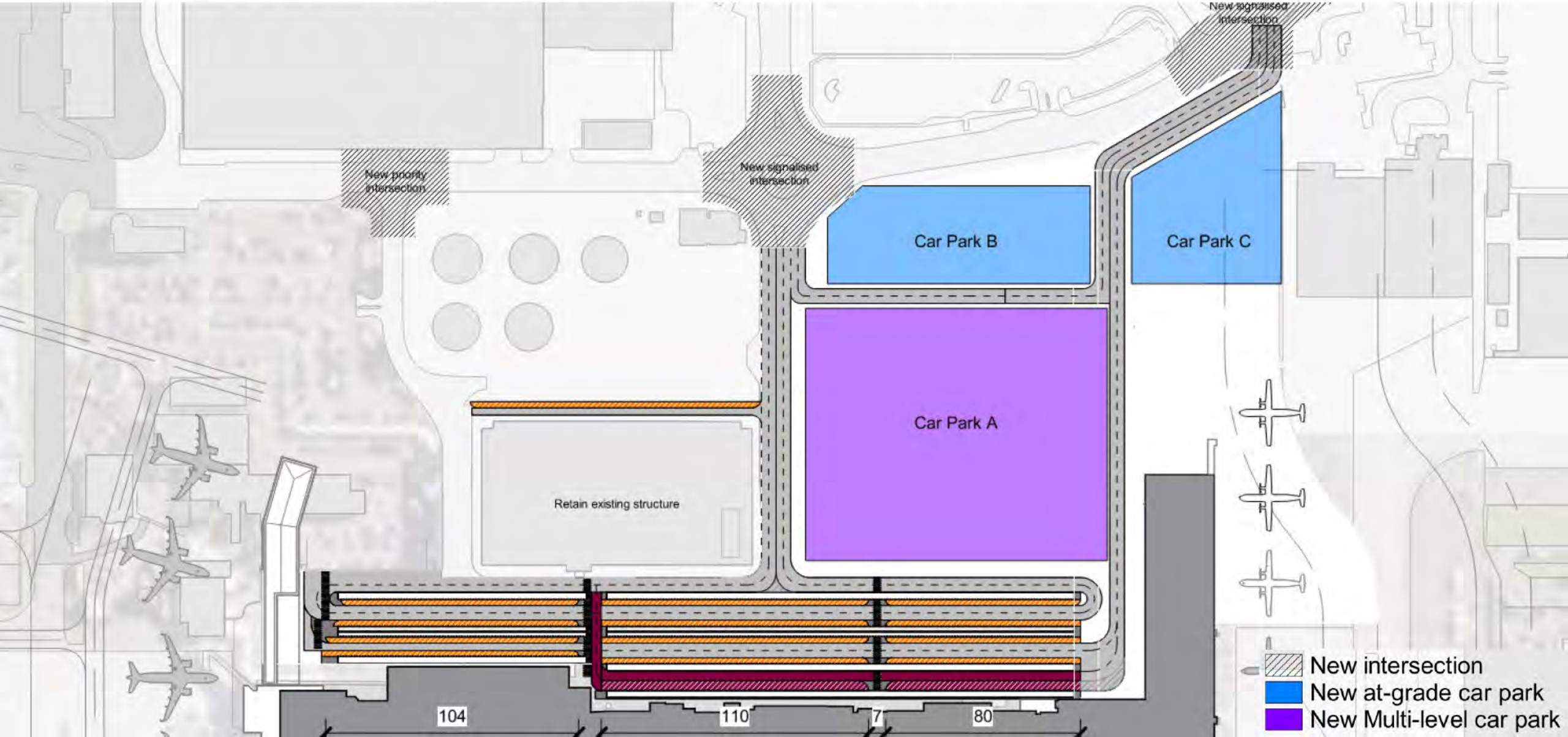


Landside

Regional Headhouse – Scores 3



Eastern Expansion – Scores 2



DTB & Pier A1 – Scores 2

