Appendix F
International Terminal Building Main Terminal Departures Level and Boarding Areas A and G – Alternatives Analysis

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Appendix F

International Terminal Building Main Terminal Departures Level and Boarding Areas A and G – Alternatives Analysis

This appendix documents the alternatives analysis for the (1) ITB Main Terminal Departures Level and (2) B/As A and G improvements.

F.1. Main Terminal Departures Level

The ITB Main Terminal Departures Level alternatives consist of discrete processing components combined in various ways to achieve the redevelopment objectives. Below is a description of the alternatives for each processing component and the evaluation that identified the recommended alternative for each component.

The following components were included in the Main Terminal Departures Level analysis:

- Secure connector between B/As A and G
- Security screening checkpoint (SSCP)
- Ticketing/check-in
- Post-security concessions

For each component, the alternatives were rated against the evaluation criteria using a three-tiered system. The ranking tiers used in the evaluation matrix are as follows:

● Major Benefit

◐ Moderate Benefit

○ Minor Benefit or Maintains Existing

This evaluation resulted in the identification of a recommended alternative. The symbols used for that evaluation are:

✓ Selected Alternative

✘ Eliminated Alternative

F.1.1 Secure Connector between B/As A and G

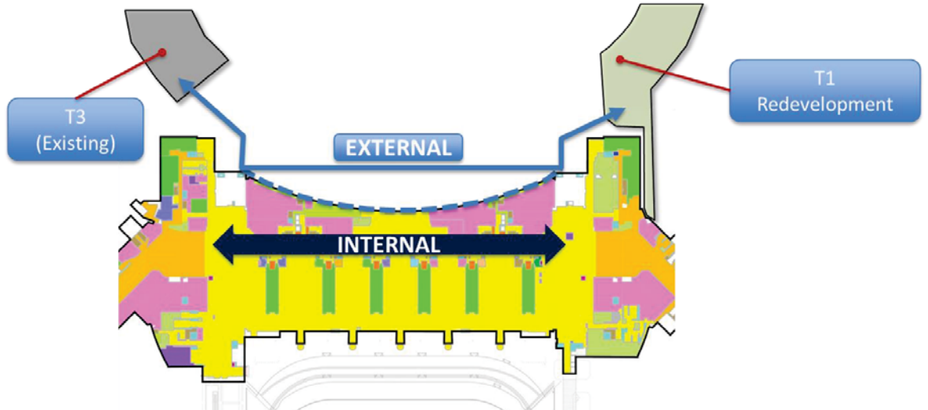
The ITB Main Terminal provides pre-security circulation between B/As A and G. One requirement of the ITB redevelopment is to create a post-security connection between B/As A and G to increase gate assignment flexibility and enhance the connecting passenger experience.

Alternative 1, illustrated in **Exhibit F.1-1**, is an external connector that would link T1 and T3 post-security – thereby providing a post-security connection between B/As A and G once the T1 construction is complete. Passengers connecting between B/As A and G, between T1 and T3, or any combination thereof would be able to use the external secure connector rather than exiting the secure area and re-entering the other boarding area through another security checkpoint.

The walking distance for passengers connecting between B/As A and G would nearly double while the walking distance for passengers connecting between T3 to B/A A or T1 to B/A G would remain the same (as if they were leaving and re-entering the secure area). At least two additional level changes would be required. Passengers connecting between T1 and B/A G would have a somewhat indirect and potentially confusing route as they would backtrack into T3 and use the existing secure connector between T3 and B/A G.

Because the Main Terminal would remain non-secure, it would not be possible to consolidate the two security checkpoints or create a central Concessions Marketplace.

EXHIBIT F.1-1 | Secure Connector Alternatives



Source: Image: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

Alternative 2, also illustrated in Exhibit F.1-1, is an internal secure corridor that would connect B/As A and G and provide post-security connections for passengers coming from T1 or T3 connecting to either B/As A or G. This alternative would likely require reconfiguration of the ticketing/check-in functions but would allow for a consolidated security checkpoint as well as a central Concessions Marketplace (see **Section F.1.4**). It also provides the shortest walking distance for passengers connecting between B/As A and G. The key disadvantage of the internal secure connection is the shift in vertical circulation likely required to maintain the non-secure passenger flow from T1 or T3 to the ITB.

Secure Connector between B/As A and G Evaluation

Table F.1-1 shows the evaluation matrix comparing the two secure connector alternatives and the existing condition. Due to the enhanced passenger experience, flexibility to consolidate the security checkpoint, and ability to create a Concessions Marketplace, Alternative 2 was carried forward into the recommended ITB Main Terminal Departures Level redevelopment alternative.

TABLE F.1-1 | Secure Connector Alternatives Evaluation

Evaluation Criteria	Existing	Alternative 1	Alternative 2
	No Build	*External Connector*	*Internal Connector*
Secure Connection between B/As A and G, T1 and T3	○	◐	●
Walking Distances	○	○	●
Opportunity for Consolidated Security Checkpoint	○	○	●
Opportunity for Central Concessions Marketplace	○	○	●
Recommended Alternative	✗	✗	✓

Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, March 2016

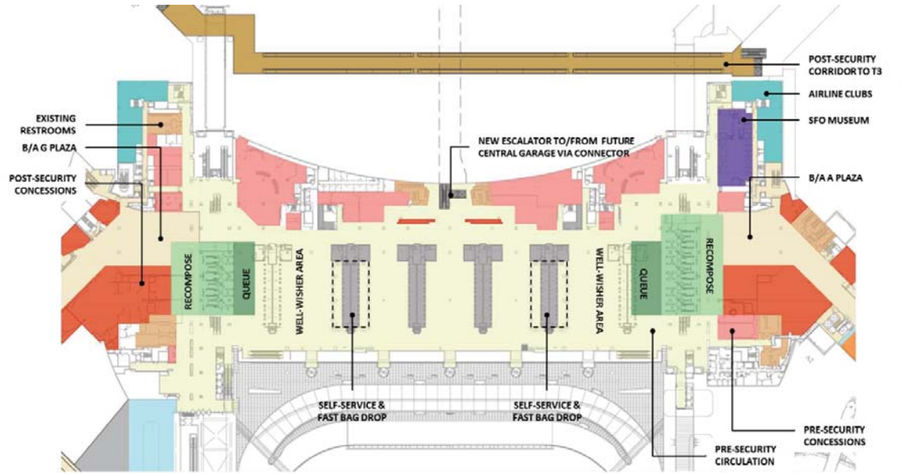
F.1.2 Security Screening Checkpoint

The ITB contains two separate security screening checkpoints (SSCPs), one each for B/As A and G. These checkpoints currently operate at capacity during the peak hours of international departures.

Alternative 1, illustrated in **Exhibit F.1-2**, includes an expansion of the two existing SSCPs to meet forecast demand. The SSCP at B/A A would be expanded to eleven lanes and the SSCP at B/A G would be expanded to seven lanes to meet the Base Constrained demand level. These expansions would require the removal of the outermost ticketing/check-in island on each side of the Main Terminal and would displace some existing adjacent pre-security retail shops.

Pre-security circulation patterns would remain the same as they are today, with passengers checking in at the islands in the Main Terminal and proceeding to their boarding areas for screening. Alternative 1 preserves the opportunity to provide a connection to the future Central Hub.

EXHIBIT F.1-2 | Security Checkpoint Alternative 1

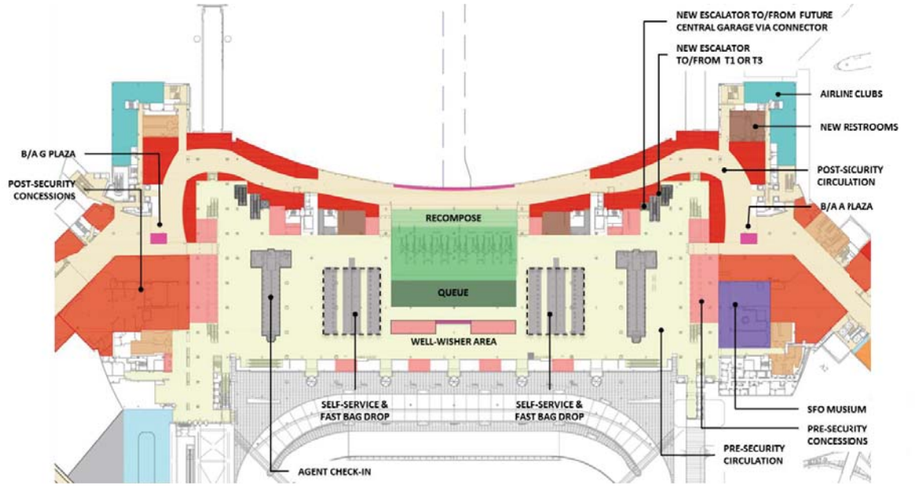


Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

Alternative 2, illustrated in **Exhibit F.1-3**, includes a new combined SSCP at the center of the Main Terminal. The central SSCP would consist of thirteen lanes to meet the Base Constrained demand level. This consolidation would require the removal of the two innermost ticketing/check-in islands and would reconfigure existing Food Courts A and G from the non-secure side to the secure side.

Pre-security circulation patterns would change significantly. Passengers would check in using the outer ticketing/check-in counters and proceed to the center of the Main Terminal for screening. An expanded well-wishers area could be provided in the center area. The back of the Main Terminal would be converted to an internal secure-side connector so that passengers could access the boarding areas from the new SSCP.

EXHIBIT F.1-3 | Security Checkpoint Alternative 2



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

Security Screening Checkpoint Evaluation

Table F.1-2 shows an evaluation matrix that compares the two security checkpoint alternatives to the existing condition. Due to the enhanced wayfinding, reduced security checkpoint staffing requirements, efficiency of handling overlapping international departure peak periods, and ability to create a Concessions Marketplace, Alternative 2 was carried forward into the recommended ITB Main Terminal Departures Level redevelopment alternative.

TABLE F.1-2 | Security Screening Checkpoint Alternatives Evaluation

Evaluation Criteria	Existing *No Build*	Alternative 1 *Two expanded SSCPs*	Alternative 2 *Centralized SSCP*
Screening Capacity	○	●	●
Staffing and Space Efficiency	○	○	●
Minimal Displacement of Existing Facilities	●	●	○
Cost and Complexity of Secure Connector	○	○	●
Right-sized Post-Security Concessions	○	○	●
Right-sized Pre-Security Concessions	○	○	◐
Recommended Alternative	✗	✗	✓

Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, March 2016

F.1.3 Ticketing/Check-in Hall

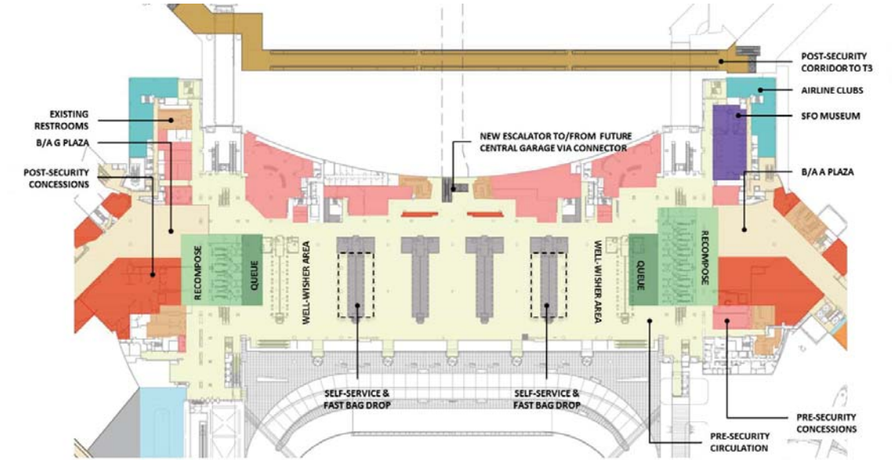
The ITB contains twelve common use ticketing/check-in aisles arranged as six islands. Airlines are assigned positions on these aisles based on their flight schedules, with multiple airlines capable of using all or a part of each aisle. Because of technological changes and advances in the check-in process since the ITB was built, the Main Terminal contains a surplus of check-in desk capacity and a lack of self-service capacity.

Security checkpoint Alternatives 1 and 2 each require the removal of two check-in islands; therefore, for the purposes of this alternatives analysis, it is assumed that space will remain for no more than four check-in islands.

ITB Arrivals Level Alternative 2 would provide a "grand stairway" between the Arrivals and Departures Levels of the Main Terminal (see **Appendix E**). This alternative is compatible with both Departures Level alternatives below, although the location of the grand stairway would need to be coordinated with the locations of the ticketing/check-in facilities.

Alternative 1, illustrated in **Exhibit F.1-4**, includes four check-in islands. Either the innermost or outermost two islands would be removed, depending on the ultimate layout of the SSCP. The remaining islands nearest the SSCP(s) would be dedicated to self-service and fast bag drop. This alternative provides sufficient overall capacity but does not optimize the floor area for self-service kiosk and fast bag drop options.

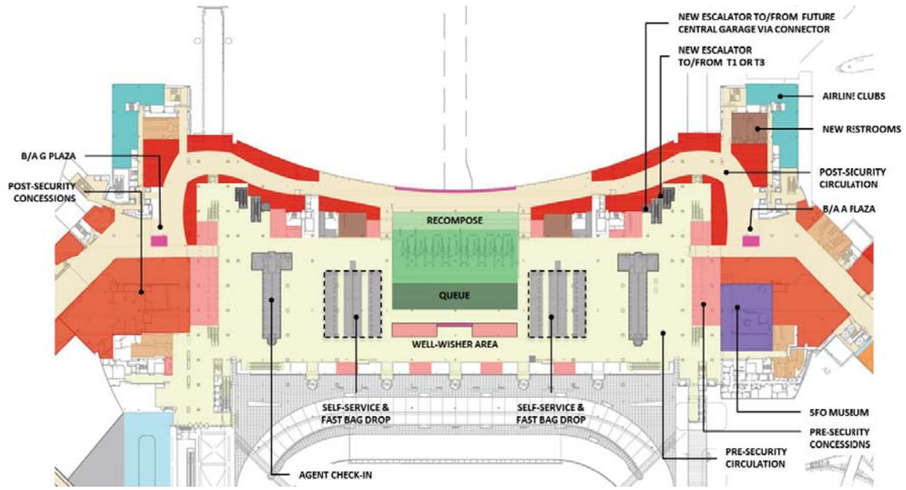
EXHIBIT F.1-4 | Ticketing/Check-in Alternative 1



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

Illustrated in **Exhibit F.1-5**, Alternative 2 includes two check-in islands and two self-service check-in and bag drop areas. The self-service areas would be located adjacent to the SSCP(s) to improve visibility and passenger flow to the checkpoints. The remaining two agent check-in islands would be located farther from the SSCPs. This alternative provides sufficient capacity and balances demand between full service desks and self-service kiosk and fast bag drop options.

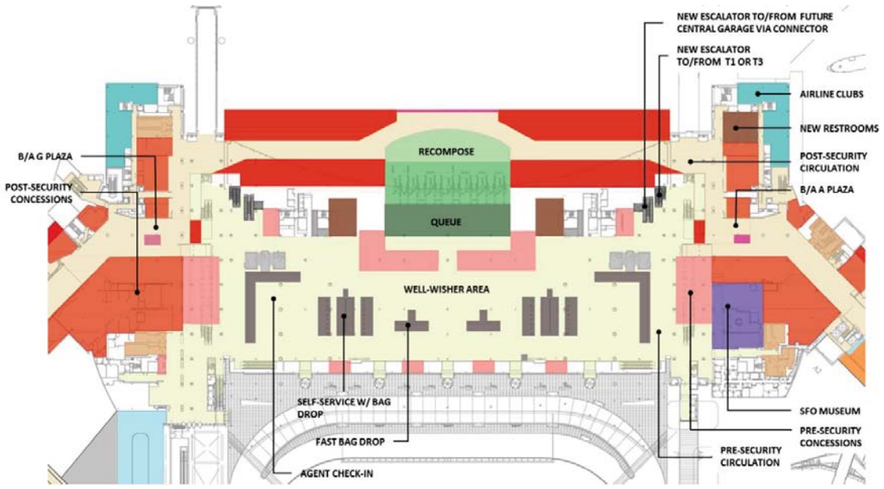
EXHIBIT F.1-5 | Ticketing/Check-in Alternative 2



Source: *ADP International Terminal Building Redevelopment Study Analysis*, Landrum & Brown, July 2015

Alternative 3, illustrated in **Exhibit F.1-6**, includes a full reconfiguration of the ticketing/check-in area. All of the existing islands would be removed and replaced with a mix of full service desks and self-service kiosks and fast bag drops. This alternative requires the airlines to shift to a mostly shared-use check-in arrangement, where any kiosk or fast bag drop may be used by any airline passenger. Each airline would have a small full service presence at the reconfigured agent check-in areas. These areas could be reconfigured to provide modern amenities like seating areas for large groups. Expansion of the Main Terminal Departures Level would provide additional space to take full advantage of the ticketing/check-in reconfiguration.

EXHIBIT F.1-6 | Ticketing/Check-in Alternative 3



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

Ticketing/Check-in Hall Evaluation

Table F.1-3 shows the evaluation matrix comparing the three ticketing/check-in hall alternatives. Due to the balance of full service and self-service facilities, enhanced passenger experience, and improved passenger flow, Alternative 3 was carried forward into the ITB Main Terminal Departures Level redevelopment alternatives.

TABLE F.1-3 | Ticketing/Check-in Hall Alternatives Evaluation

Evaluation Criteria	Existing	Alternative 1[1]	Alternative 2	Alternative 3
	Six Islands	*Four Islands*	*Two Islands with Self-Service Areas*	*Full Reconfiguration with Full Service and Self-Service Areas*
Balance of Full Service and Self-Service	○	◐	●	●
Enhance Passenger Experience	○	○	◐	●
Improve Passenger Flow	○	○	◐	●
Minimal Displacement of Existing Facilities	●	◐	○	○
Recommended Alternative	✗	✗	✗	✓

Note 1: Because either SSCP alternative would eliminate two islands, a "no build" scenario does not exist.

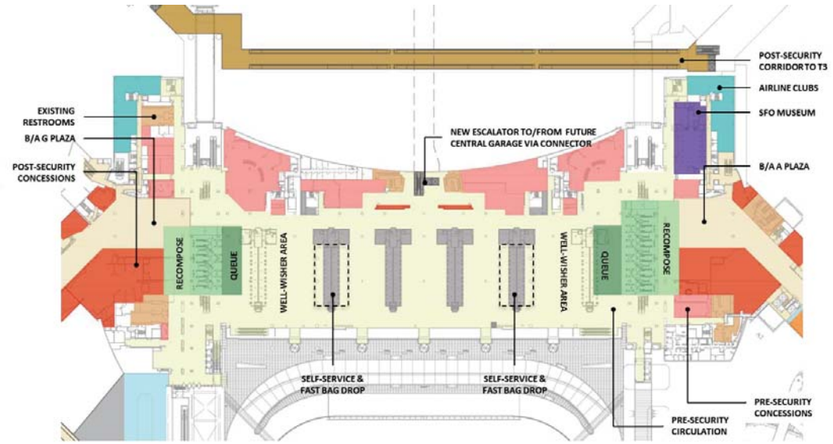
Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, March 2016

F.1.4 Post-Security Concessions

Most of the concessions spaces in the existing Main Terminal are located pre-security. This arrangement limits access to travelers who prefer to clear the SSCP before shopping.

Alternative 1, illustrated in **Exhibit F.1-7**, is compatible with SSCP Alternative 1 (expand two checkpoints) only. The two existing food courts would remain pre-security, but the post-security Duty Free areas would expand slightly. Passengers using the external post-security connector would not pass through any ITB concessions areas.

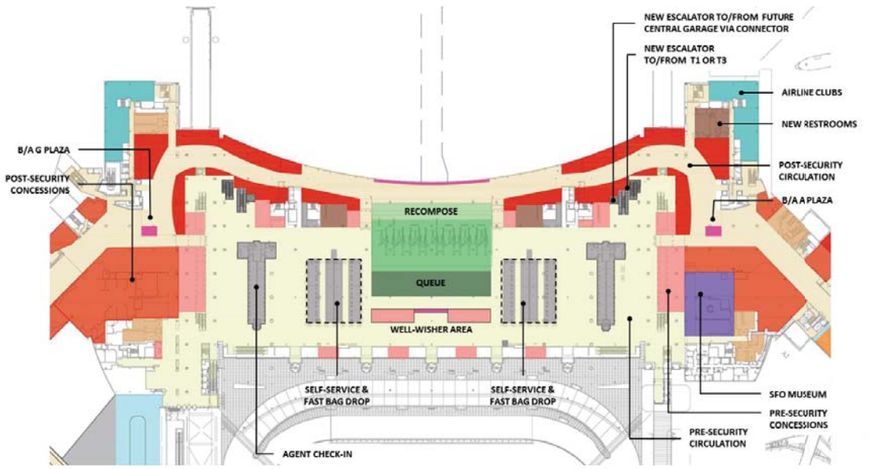
EXHIBIT F.1-7 | Post-Security Concessions Alternative 1



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

Alternative 2, illustrated in **Exhibit F.1-8**, is compatible with SSCP Alternative 2 (centralized checkpoint) only. The two existing food courts would be reconfigured to face the internal secure connector, and they would be reallocated as retail and Duty Free shops. If the existing non-secure vertical circulation cores were moved, then concessions would also fill in the former cores. Additional food concession options would be added to the boarding areas to accommodate the displaced food courts. However, this alternative does not provide the target amount of post-security retail space as the new shops would be limited by the size of the existing building.

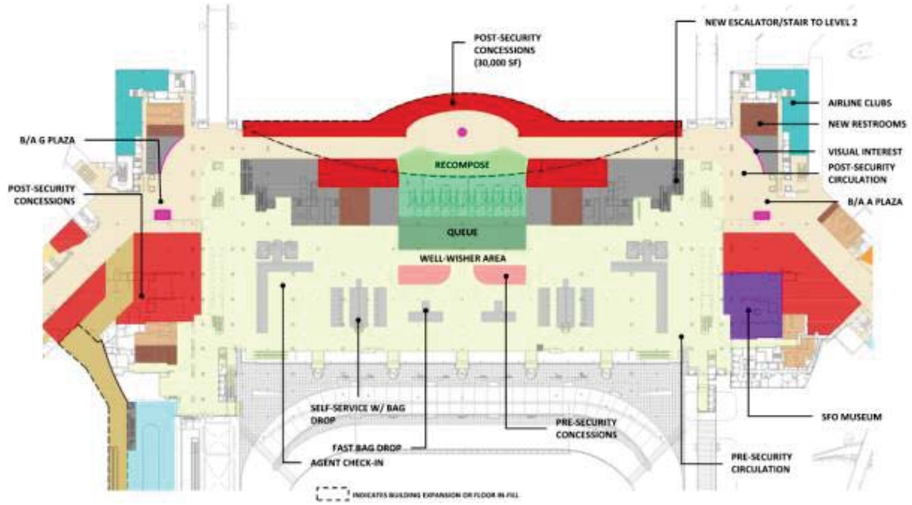
EXHIBIT F.1-8 | Post-Security Concessions Alternative 2



Source: *ADP International Terminal Building Redevelopment Study Analysis*, Landrum & Brown, July 2015

Alternative 3, illustrated in **Exhibit F.1-9**, is compatible with SSCP Alternative 2 (centralized checkpoint) only. The two existing food courts would be reconfigured to face the internal secure connector and a building extension would accommodate an additional Concessions Marketplace consisting primarily of Duty Free and other retail shops. The rear of the Main Terminal would be extended with the deepest portion of the extension located in the center near the SSCP recompose area. This design would allow the SSCP to be moved farther from the curbside and deeper into the building, thereby improving pre-security circulation and queuing for the SSCP.

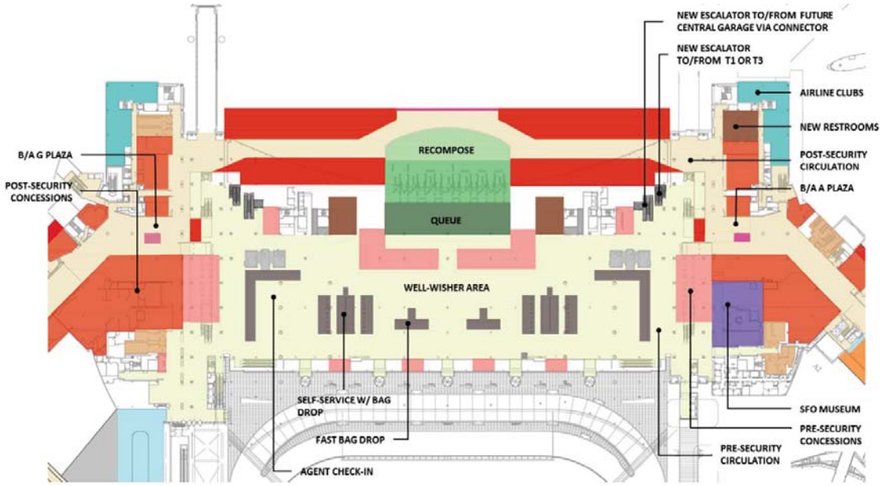
EXHIBIT F.1-9 | Post-Security Concessions Alternative 3



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

Alternative 4, illustrated in **Exhibit F.1-10**, is similar to Alternative 3 but includes a larger building expansion to provide additional concessions space and potential additional passenger amenities.

EXHIBIT F.1-10 | Post-Security Concessions Alternative 4



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

Post-Security Concessions Evaluation

Table F.1-4 shows an evaluation matrix that compares the four post-security concessions alternatives and the no-build alternative. Alternative 3 supports an optimal balance of pre- and post-security concessions and the ability to accommodate a centralized SSCP; therefore, this plan was carried forward as the recommended alternative.

Alternative 2 could be an initial implementation phase for Alternative 3. The ability to develop Alternative 4 could also be preserved to permit flexibility for changes in TSA security screening processes, expanded concessions programs, or additional passenger amenities that may be identified at a future date.

TABLE F.1-4 | Post-Security Concessions Alternatives Evaluation

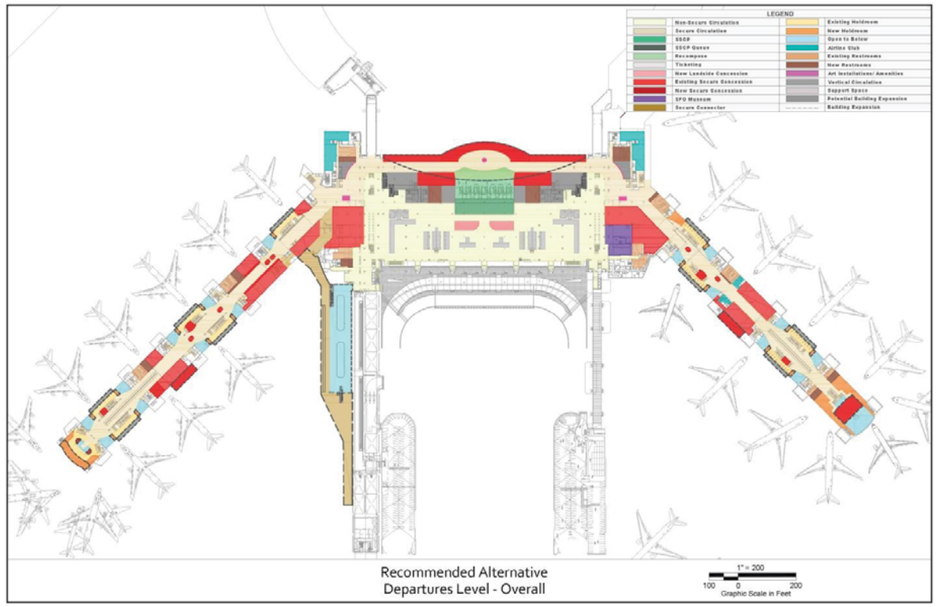
Evaluation Criteria	Existing	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	No Build	*Expand Duty Free in Place*	*Post-Security Concessions Marketplace, No Building Expansion*	*Post-Security Concessions Marketplace, Moderate Building Expansion*	*Post-Security Concessions Marketplace, Large Building Expansion*
Right-sized Pre-Security Concessions	○	○	●	◐	●
Right-sized Post-Security Concessions	○	◐	◐	●	●
Allows Ideal Positioning of SSCP Recompose Area	○	○	○	●	●
Construction Cost and Complexity	N/A	●	●	◐	○
Recommended Alternative	✘	✘	✘	✓	✘

Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

F.1.5 Recommended Development

As depicted in **Exhibit F.1-11**, the recommended development for the Departures Level Main Terminal is a combination of the recommended alternatives for each of the processing components. The recommended development reflects the optimal amount of building expansion for the Main Terminal that accommodates the consolidated security checkpoint, reconfigured ticketing/check-in, and post-security connector requirements. Furthermore, it offers a balanced distribution of post-security concessions between the Main Terminal and boarding areas.

EXHIBIT F.1-11 | Main Terminal Departures Level Recommended Development



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

F.2 Boarding Area

The ITB boarding area redevelopment alternatives consist of holdrooms, concessions, and other amenities combined in various ways to achieve the redevelopment objectives. Below is a description of the boarding area alternatives and the evaluation that identified the recommended alternative.

Each alternative was rated against the evaluation criteria using a three-tiered system. The ranking tiers used in the evaluation matrix are as follows:

● Major Improvement

◐ Moderate Improvement

○ Minor Improvement or Maintains Existing

This evaluation resulted in the identification of a recommended alternative. The symbols used for that evaluation are:

✓ Selected Alternative

✘ Eliminated Alternative

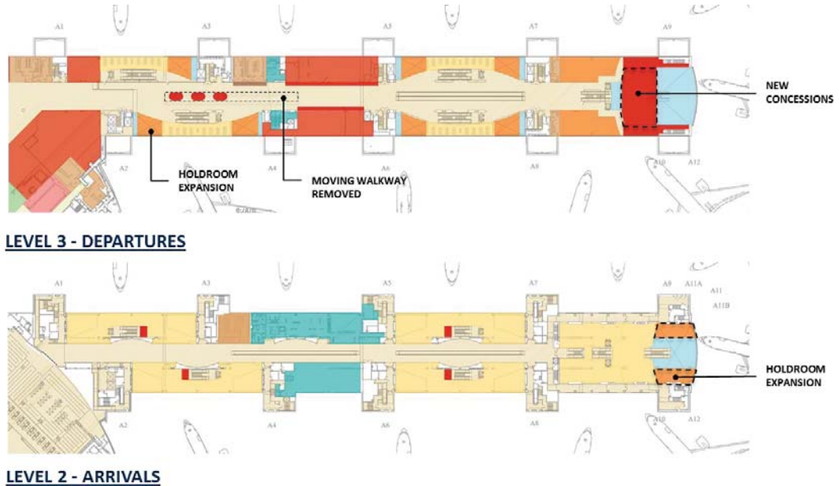
F.2.1 Boarding Area Alternatives

Most of the holdroom space in B/As A and G is located on the Arrivals Level (Level 2), from which passengers board their flights. This design results in passengers being less likely to return to the Departures Level (Level 3), where all of the concessions are located, once they locate and enter the downstairs holdroom. While there is some holdroom seating on the Departures Level, it is limited and passengers typically proceed to the Arrivals Level holdroom where gate agents are located and boarding occurs.

The primary objective of the boarding area improvements is to enhance the guest experience by integrating concessions and holdrooms on the Departures Level, thereby encouraging passengers to remain on the Departures Level until boarding begins. This plan minimizes congestion in the Arrivals Level holdrooms and provides convenient access to concessions, restrooms, and other amenities.

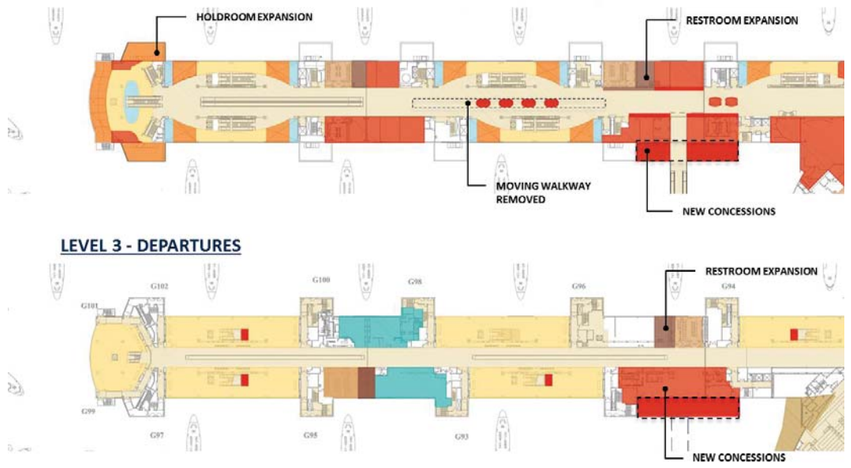
Alternative 1, illustrated in **Exhibit F.2-1** for B/A A and **Exhibit F.2-2** for B/A G, consists of concessions and holdroom improvements and a building expansion only at the point of connection with the proposed B/A H near Gate G91. The moving walkway closest to the Main Terminal in each boarding area would be removed to create a concession opportunity in the center of the concourse, and new floor space would be created at the end of the boarding areas to increase the concessions area. Holdroom expansion would be achieved by filling in the Departures Level open-to-below areas adjacent to the holdrooms. This alternative, while providing some additional Departures Level holdroom space, still results in a significant shortage of both holdroom and concessions space and provides little or no opportunity for integrated holdrooms and concessions.

EXHIBIT F.2-1 | Boarding Area A Alternative 1



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

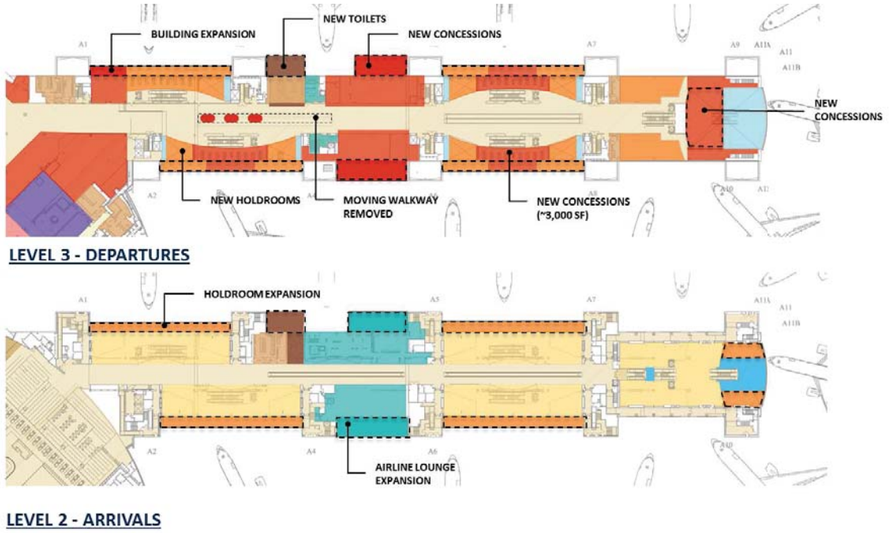
EXHIBIT F.2-2 | Boarding Area G Alternative 1



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

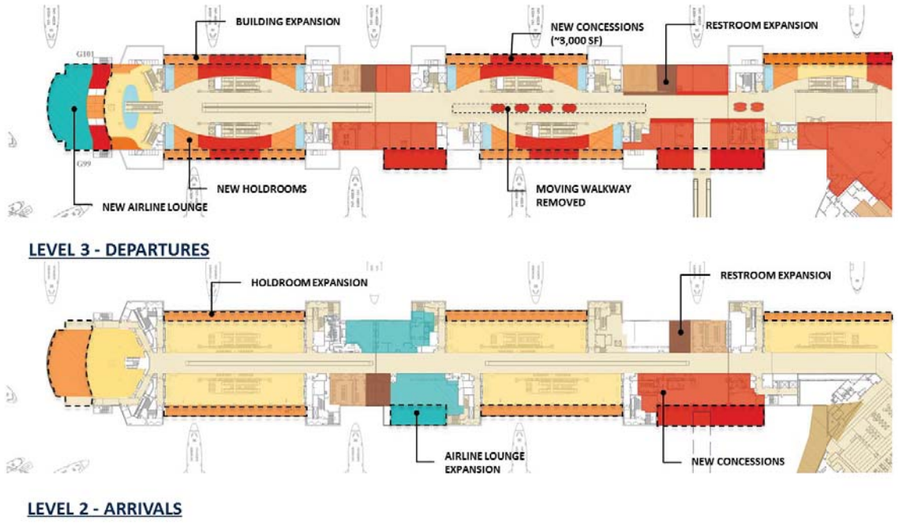
Alternative 2, illustrated in **Exhibit F.2-3** for B/A A and **Exhibit F.2-4** for B/A G, consists of targeted building expansions to optimize the size of holdrooms and concessions. The moving walkway closest to the Main Terminal would be removed to provide a concession opportunity in the center of the concourse and new floor space would be created at the end of the boarding areas to increase the concessions area. Holdroom and concession expansion would be achieved by filling-in the Departures Level open-to-below-areas adjacent to the holdrooms as well as moderate building expansion without impacting the aircraft parking positions and apron operations. This alternative results in a moderate surplus of both holdroom and concessions space, particularly on the Departures Level, yet it provides substantial opportunity for integrated holdrooms and concessions.

EXHIBIT F.2-3 | Boarding Area A Alternative 2



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

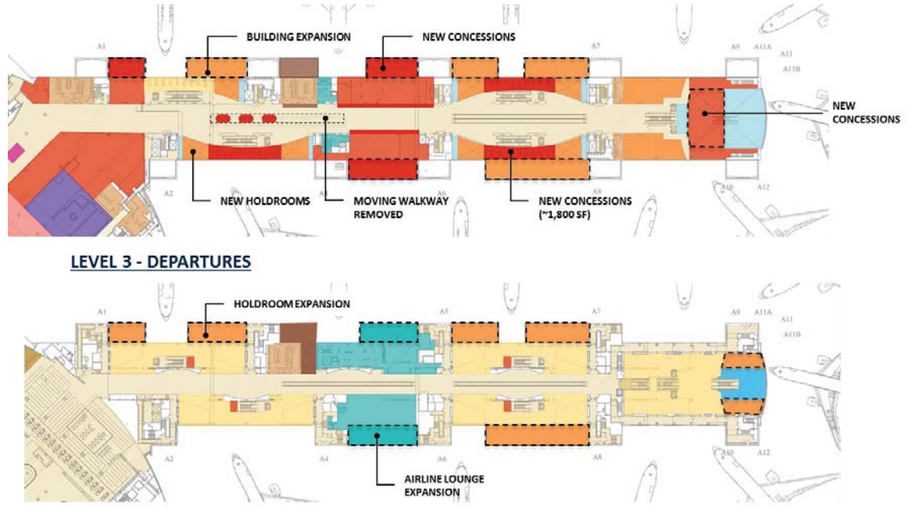
EXHIBIT F.2-4 | Boarding Area G Alternative 2



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

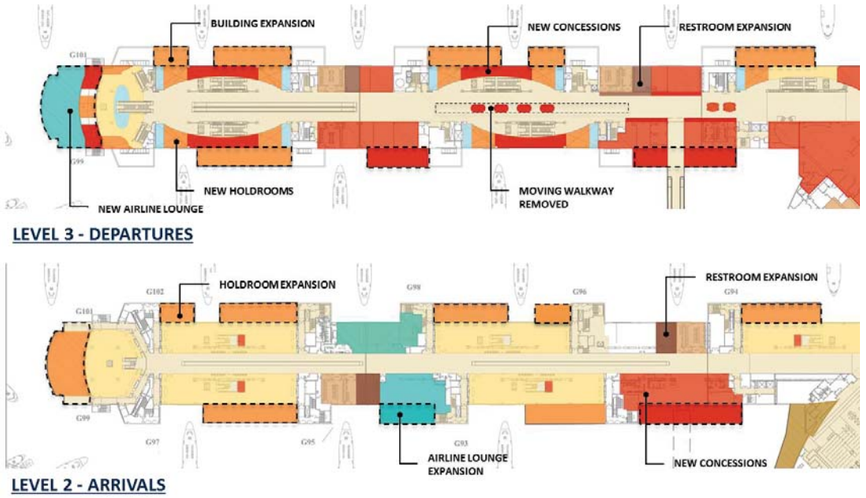
Alternative 3, illustrated in **Exhibit F.2-5** for B/A A and **Exhibit F.2-6** for B/A G, consists of significant building expansions to maximize the size of holdrooms and concessions. The moving walkway closest to the Main Terminal would be removed to provide a concession opportunity in the center of the concourse and new floor space would be created at the end of the boarding areas to increase the concessions area. Holdroom and concession expansion would be achieved by filling in the Departures Level open-to-below areas adjacent to the holdrooms as well as expanding the buildings to the greatest extent possible without impacting the aircraft parking positions and apron operations. This alternative results in a significant surplus of both holdroom and concessions space, particularly on the Departures Level, and substantial opportunity for integrated holdrooms and concessions. Some of the surplus space could be used for airline lounges. In some locations, the new airline lounges would allow passengers to directly board aircraft from the lounges.

EXHIBIT F.2-5 | Boarding Area A Alternative 3



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

EXHIBIT F.2-6 | Boarding Area G Alternative 3



Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, July 2015

F.2.2 Evaluation and Recommended Development

Table F.2-1 shows the evaluation matrix comparing the three boarding area alternatives. Alternative 1 was rejected because it does not meet the capacity and guest experience requirements. Due to the optimal integration of holdrooms and concessions with measured building expansion, Alternative 3 was carried forward as the recommended alternative.

Alternatives 1 and 2 allow for further evolution toward Alternative 3 to accommodate future changes in passenger demand and additional concessions.

TABLE F.2-1 | Boarding Area Improvement Alternatives Evaluation

Evaluation Criteria	Existing	Alternative 1	Alternative 2	Alternative 3
	No Build	*No Building Expansion*	*Optimized Building Expansion*	*Maximum Building Expansion*
Holdroom Capacity	○	○	●	●
Concessions Area	○	○	●	●
Integrated Concessions and Holdrooms	○	○	●	●
Enhanced Guest Experience	○	◐	●	●
Construction Cost and Complexity	N/A	●	○	○
Recommended Alternative	✗	✗	✓	✗

Source: ADP International Terminal Building Redevelopment Study Analysis, Landrum & Brown, March 2016.