Terminal Alternatives

The existing terminal building and concourse can accommodate most of the passenger processing demand through the planning period. The facility requirements show only a few areas are deficient. These areas are the passenger security screening checkpoint (SSCP), post-security concessions, and outbound baggage makeup. The SSCP is the only significant deficiency, requiring double the square footage and number of screening lanes as currently exists. Additional square footage is needed for post-security concessions and outbound baggage makeup, but not significant enough to warrant major expansion. Also, at the request of the airport, facility requirements for an international arrival facility (IAF) were generated to explore options in the event international demand came to fruition. These areas were the focus of the terminal alternatives.

Beyond facility requirements for the major passenger processing areas, there are infrastructure deficiencies in the underground tunnel connector and old departure concourse that are at the end of their useful lifecycle. These deficiencies should be addressed by upgrading or replacing the equipment. These elements, like vertical circulation, are already in the Airport's capital improvement program (CIP), and were acknowledged in the alternatives to ensure consistency between near-term improvements and the long-term master plan.

Six months prior to the start of the master plan update, LNAA contracted a separate company to develop security checkpoint alternatives. To be efficient with the master plan update process, alternatives that were preferred by LNAA developed during the security checkpoint study were carried forward in combination with new alternatives developed as a part of the master plan update. Terminal alternatives are summarized below and can be seen in **Figures 6.3.6 – 6.3.11**

Alternative 1A

Alternative 1A is a modified version of an alternative developed in the previous security checkpoint study. A building expansion is constructed adjacent to the existing terminal building. The new space will accommodate TSA security checkpoint functions. The main difference between the previous study and the current alternative is added space for flexibility to accommodate changes to TSA processing, and a larger queue area. The queue area is accommodated primarily within the existing building. Area for a new LNAA boardroom is adjacent to the new SSCP. In this alternative, an apron-level enclosed walkway connects the terminal building and the Satellite Wiley Concourse. Existing vertical circulation to the concourse's second level is still used by departing and arriving passengers. New vertical circulation for arriving passengers down to the connector tunnel is constructed to replace the aging, over-capacity vertical circulation. There are no other changes to the concourse. The total cost for this alternative is estimated at $9.1 million (see **Figure 6.3.6**).

Alternative 1B

Alternative 1B is the same as Alternative 1A except the vertical circulation to the satellite concourse occurs immediately after the passenger security checkpoint. This connects passengers directly to the Satellite Wiley Concourse at the departure level. For airlines, it maintains a service vehicle lane between the terminal and concourse, which provides a more direct path to/from the baggage makeup areas and concourse. For arriving passengers, the existing vertical circulation is used. A new vertical circulation to the connector tunnel is constructed to replace the existing vertical circulation for arriving and departing passengers. There are no other changes to the concourse. In either Alternative 1A or 1B, an IAF can only be constructed as a separate

building, as shown in Alternative 3A. The total cost for this alternative is estimated at $13.5 million (see **Figure 6.3.7**).

Alternative 1C

Alternative 1C uses the conceptual philosophy of 1A and 1B and modifies the plan to accommodate as much of the alternative within the existing building footprint. The SSCP is relocated to the departure level of the terminal building in the lobby. To maintain the vertical circulation to/from the lower level, a building expansion to the north is required, although, about half the size of the building expansion shown in Alternatives 1A and 1B. In the Alternative, a different location for the proposed LNAA boardroom will be required, possibly at a mezzanine level above the security checkpoint. Like Alternatives 1A and 1B, an enclosed walkway, connects the new SSCP to the Satellite Wiley Concourse, at either apron level or at the departures level. To maximize the existing infrastructure, the Alternative 1C plan shows an at-grade connector. A new vertical circulation core is constructed for arriving passengers to access the connector tunnel and replace the existing vertical circulation infrastructure. The old Satellite Concourse could be reconfigured and expanded into an IAF with two gates. As drawn, these gates would be for arriving international passengers only, departures would occur at domestic gates. The total cost for the terminal portion of this alternative is estimated at $10.2 million and the IAF is estimated at $9 million (see **Figure 6.3.8**).

Alternative 2

Alternative 2 redevelops the concourses in-line with long-term development, beyond the planning period. The best way to double gates is to demolish the old Satellite Concourse, and mirror the Satellite Wiley Concourse. While this is not needed in the planning horizon, there are advantages to constructing improvements that meet the current demand, but are in-line with long-term development. The SSCP is constructed, at the departure level, and directly connected to the Satellite Wiley Concourse. To accomplish this, the old Satellite Concourse is demolished. In addition to the new security checkpoint, a portion of the long-term concourse is constructed, to replace existing gates, or at a minimum, add one or two flexible gates that can be used as either domestic or international gates. This development would create an opportunity for additional concessions. Arriving passengers could use the existing vertical circulation and new vertical circulation to get down to the connector tunnel, or they could pass by the new security checkpoint and circulate back to the terminal on the same path as departing passengers. At the lower level, there is ample space for an IAF that could be implemented quickly as the shell space would already have been constructed. The total cost for the terminal portion of this alternative is estimated at $41 million and the IAF is estimated at $11.2 million (see **Figures 6.3.9a – 6.3.9b**).

Alternative 3A

Alternative 3A is similar to 1C in that it attempts to maximize using existing facilities before expanding outside the building footprint. This alternative moves the SSCP to the old Satellite Concourse. The old Satellite Concourse is reconfigured and expanded to accommodate the new functions. A pair of vertical circulation cores flank to old vertical circulation cores to separate departing and arriving passengers. There are no other changes to the terminal or concourses. The only opportunity to construct an IAF in Alternative 3A would be a remote facility. The site selected for this is the location of the old terminal building. The old

terminal building would be demolished and the new facility constructed. An arrivals curbside and sidewalk to the main terminal would also be constructed. The total cost for the terminal portion of this alternative is estimated at $9 million and the IAF is estimated at $15.7 million (see **Figure 6.3.10**).

Alternative 3B

Alternative 3B is a modified version of an alternative developed in the previous SCCP study. A building expansion is constructed adjacent to the old Satellite Concourse. Like Alternatives 1A and 1B, the new space will accommodate TSA security checkpoint functions through the planning period. The main difference between the previous study and the current alternative is added space for flexibility to accommodate changes to TSA processing, and a larger queue area. Departing passengers still circulate to the lower level connector tunnel as they do today then circulate up to the new SSCP via a new vertical circulation core. After the SSCP, passengers circulate through the old Satellite Concourse similar to how they do today. Arriving passengers circulate down through the tunnel connector as they do today. A modified or new vertical circulation core will be constructed to replace the aging vertical circulation infrastructure. In either Alternative 1A or 1B, an IAF could only be constructed as a separate building, as shown in Alternative 3A. The total cost for this alternative is estimated at $8.7 million (see **Figure 6.3.11**).

Evaluation Summary

The terminal alternatives were evaluated based on a terminal-specific subset of the overall evaluation criterion outlined in Section 6.2. **Table 6.3.1** depicts the detailed evaluation criterion and the scoring of each terminal alternative.

Table 6.3.1: Terminal Alternative Evaluation Summary

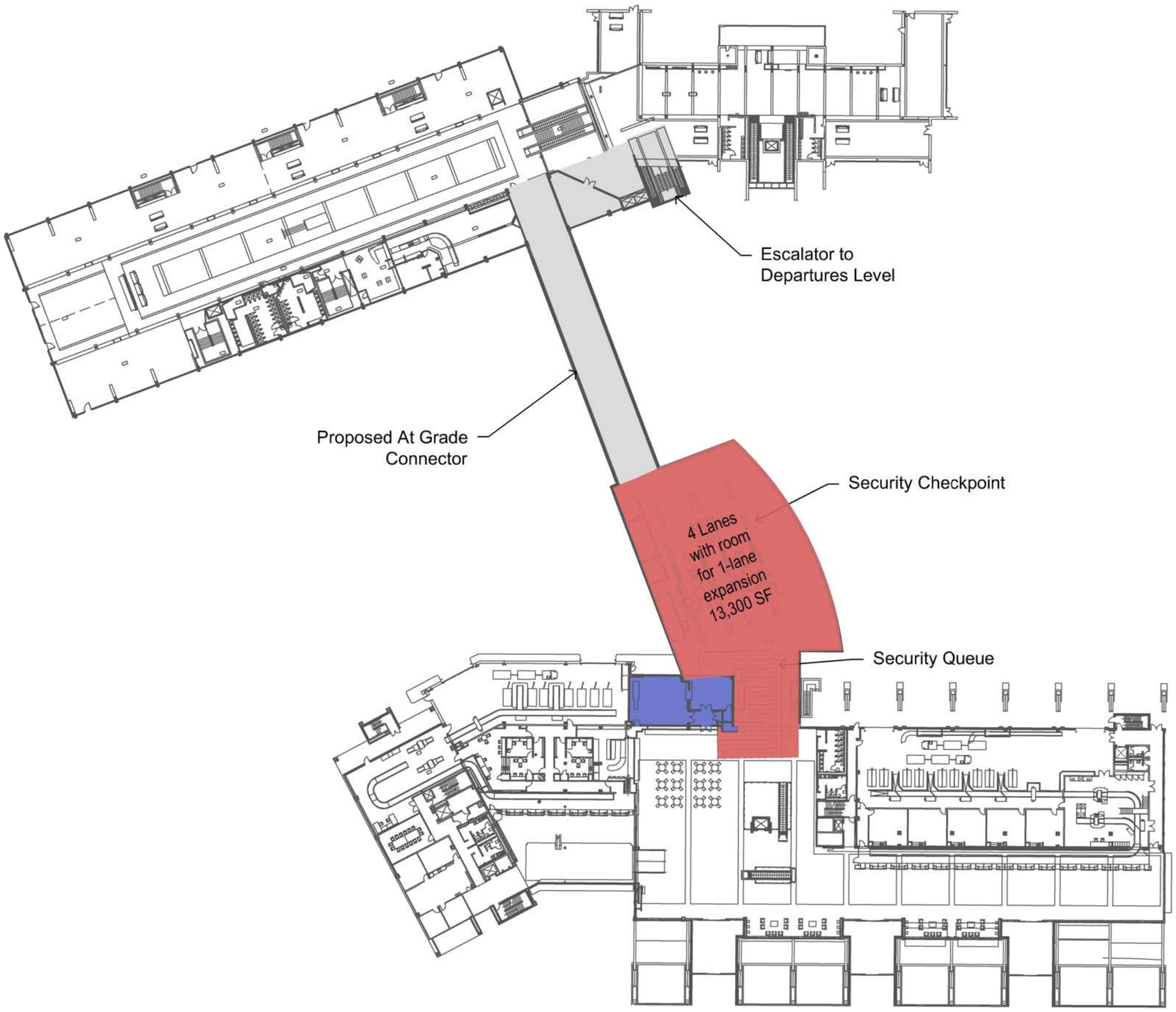
	Alternatives					
Terminal Criteria	**1A**	**1B**	**1C**	**2**	**3A**	**3B**
Economic/Strategic Factors	**7**	**6**	**8**	**7**	**5**	**7**
Compatible with long-term LNAA strategic goals/airport projects	2	2	2	3	1	2
Financial feasibility	3	2	3	1	3	3
Provides a flexible development strategy to accommodate various scenarios	2	2	3	3	1	2
Operational/Maintenance Factors	**8**	**8**	**8**	**9**	**8**	**9**
Meets planning horizon passenger demand	3	3	3	3	3	3
Meets planning horizon aircraft demand	3	3	3	3	3	3
Ease of constructability/implementation	2	2	2	3	2	3
Natural Resources/Sustainability	**3**	**3**	**6**	**2**	**4**	**2**
Maximizes the reuse of existing terminal facilities	1	1	3	1	2	1
Ability to maximize financial return on un-used and under-used areas	2	2	3	1	2	1
Social/Community Impacts/Passenger Experience	**4**	**4**	**4**	**6**	**2**	**4**
Impact to stakeholders (airlines, TSA, etc.)	3	3	3	3	1	3
Enhances concessions program for increased revenue potential	1	1	1	3	1	1
Total Score	**22**	**21**	**26**	**24**	**19**	**22**
Ranking	**3**	**5**	**1**	**2**	**6**	**3**

Source: C&S Engineers, Inc.

Alternatives 1C and 2 are the highest ranked alternatives. The evaluation included the analysis represented in the table above, discussions with TSA, and an ongoing financial analysis. In general, TSA recommends

space that is logistically optimal for them to run their operations, has ample area for their lanes and queue area, based on current standards, and provides the passengers and airport with the highest level of security. Comments from TSA have been incorporated into the final evaluation of these alternatives. However, the two differences between these alternatives are 1C is based on optimization of the existing facility, whereas 2 is based on preparation for the future, and the potential difference in financial feasibility of implementing one or the other. Due to the significant price difference between the two alternatives, the financial feasibility analysis currently under process will help to determine the preferred terminal alternative.

The proposed development for the terminal buildings and facilities are largely refurbishment-oriented or incremental in nature. They will not necessitate significant utility capacity upgrades. Upgrades include an expansion of the passenger security area and developing a potential IAF facility. Both of these expansions' alternatives are within or adjacent to the existing terminal building footprint, mitigating any utility expansion needs. One alternative for the IAF facility is a location on the existing employee/Trans-Bridge parking lots, separated from the main terminal complex and would entail utility work greater than an IAF adjacent to the existing terminal. However, as a heavily-developed area, normal coordination with local utilities on capacity and line location needs should be adequate.



Legend

- Proposed Security Checkpoint
- Proposed Public Circulation
- Proposed Board Room

N

Not To Scale

Lehigh Valley International Airport
Master Plan Update

Expanded Checkpoint with At Grade Connector

Terminal Development Alt. 1A
Figure 6.3.6

May 17, 2018 – 9:20am
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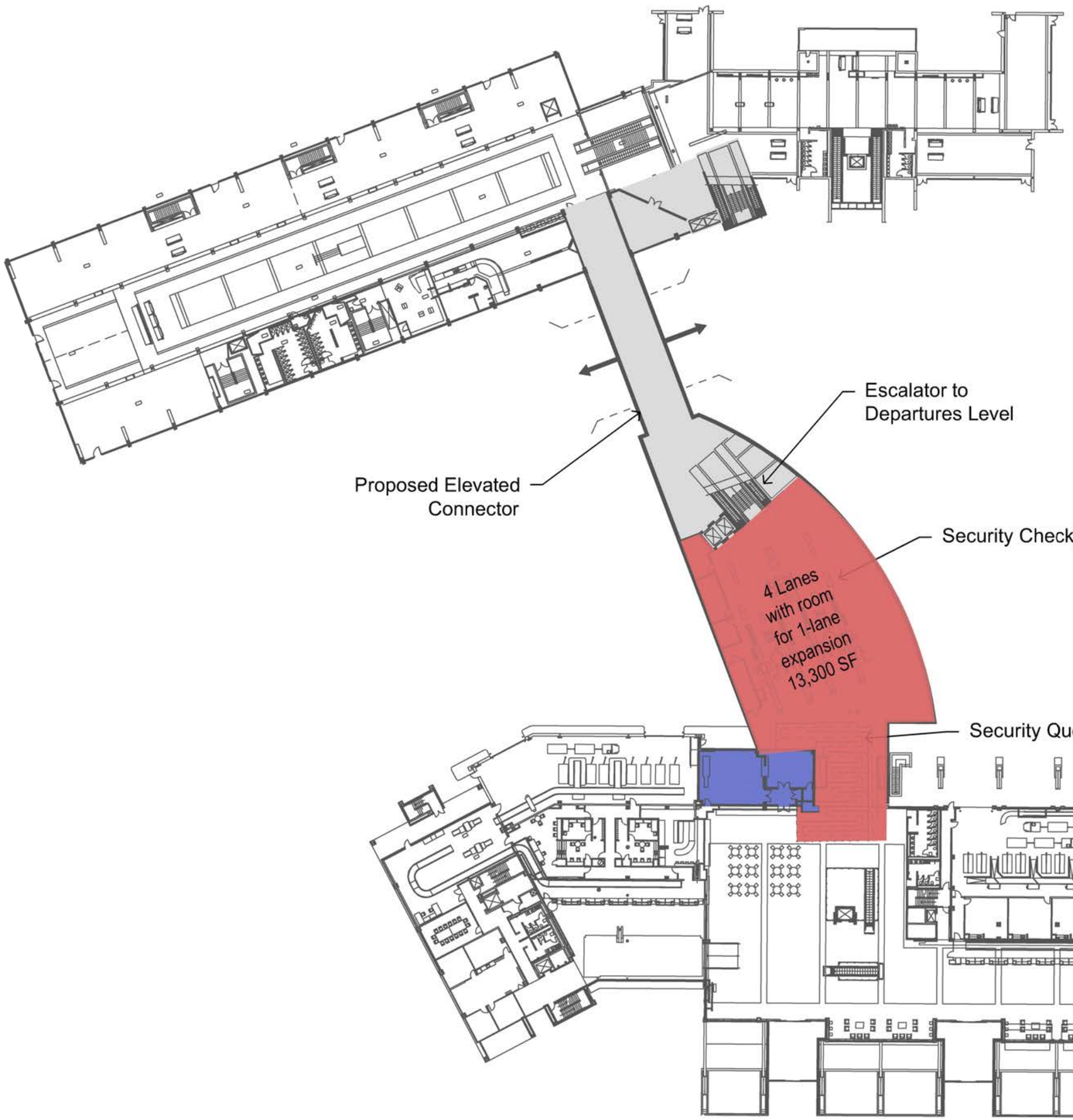


Legend

- Proposed Security Checkpoint
- Proposed Public Circulation
- Proposed Board Room

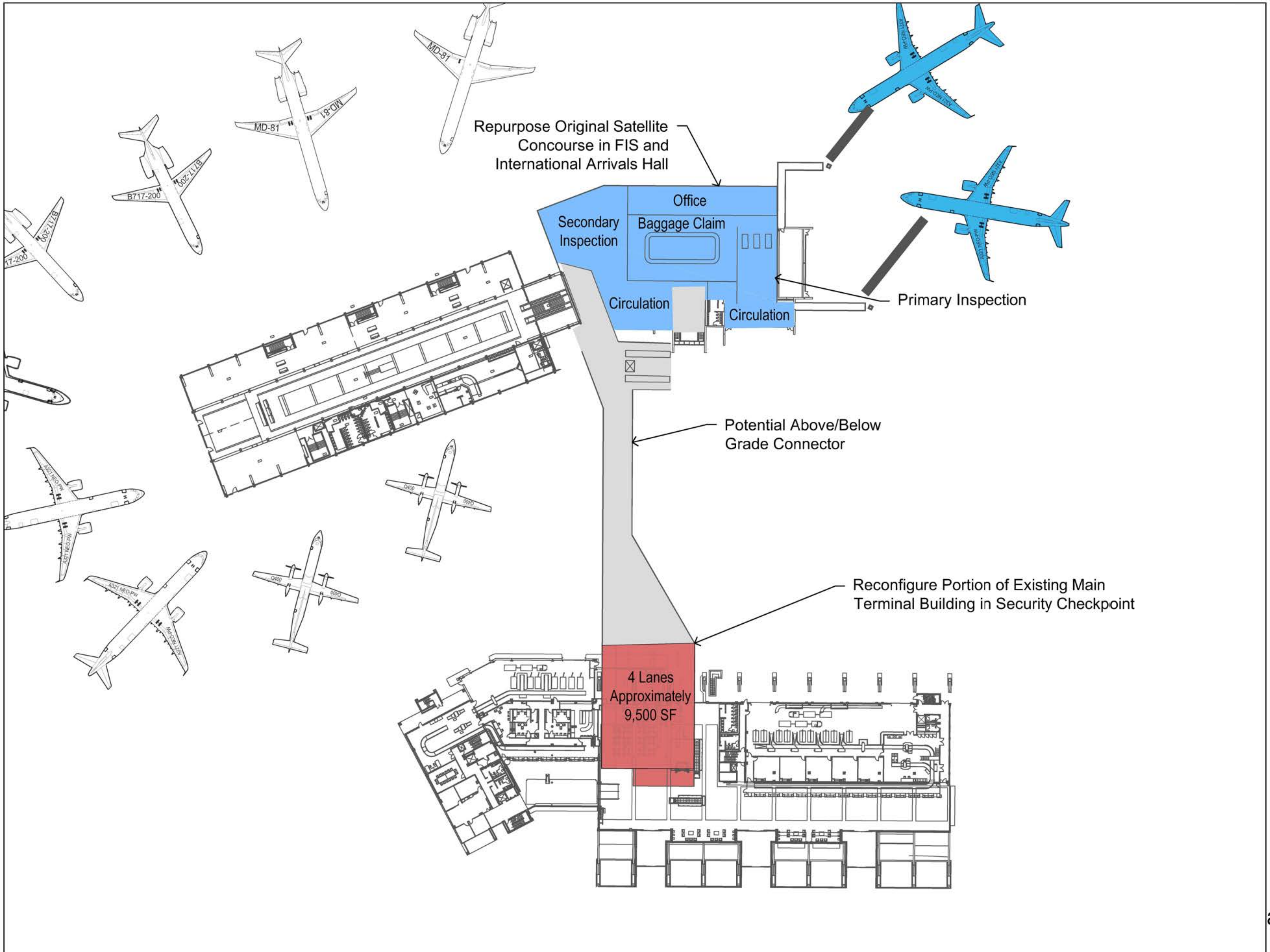
N

Not To Scale

Lehigh Valley International Airport
Master Plan Update

Expanded Checkpoint with Elevated Connector

Terminal Development Alt. 1B
Figure 6.3.7



Legend

- Proposed Security Checkpoint
- Proposed Public Circulation
- Proposed FIS

N

Not To Scale

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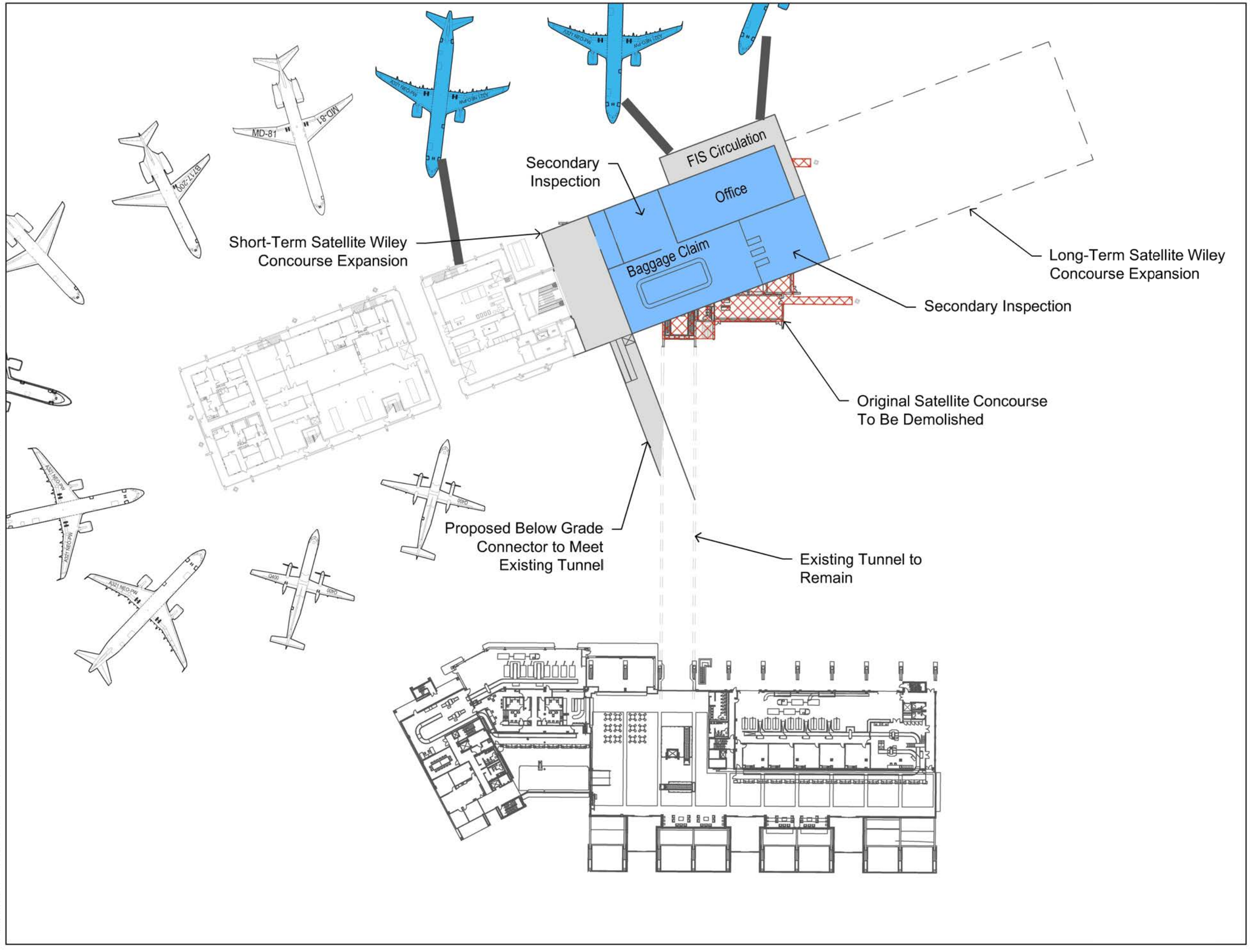
Master Plan Update

Optimize Existing Terminal and Old Departure Concourse

Terminal Development Alt. 1C

Figure 6.3.8



Legend

- Proposed Public Circulation
- Proposed FIS
- Proposed Demolition

N

Not To Scale

Lehigh Valley International Airport
Master Plan Update

Concourse Expansion Level 1

Terminal Development Alt. 2
Figure 6.3.9a

May 17, 2018 – 9:27am
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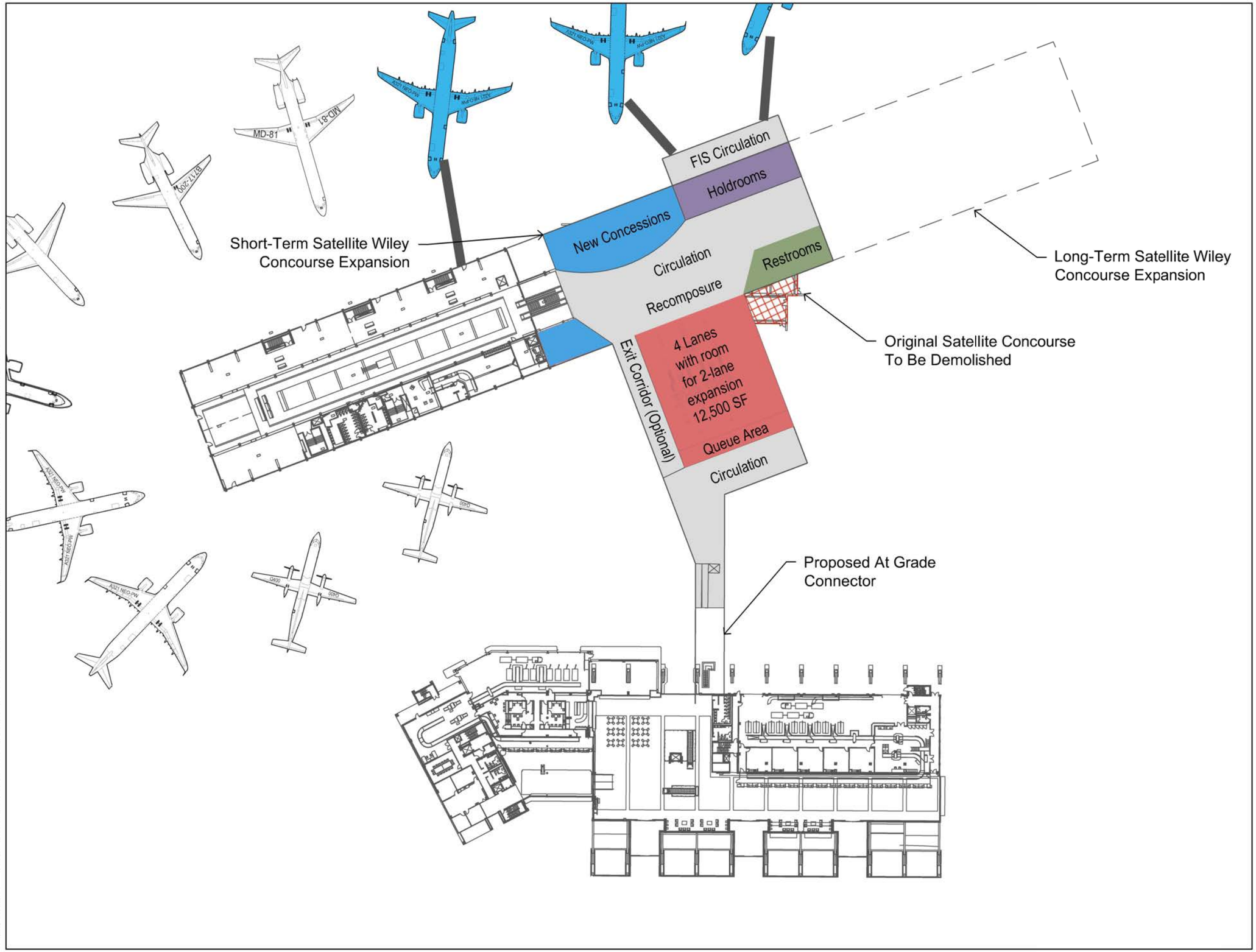

Legend

- Proposed Security Checkpoint
- Proposed Public Circulation
- Proposed Holdrooms
- Proposed Concessions
- Proposed Restrooms
- Proposed Demolition

N

Not To Scale

Lehigh Valley International Airport
Master Plan Update

Concourse Expansion - Level 2

Terminal Development Alt. 2
Figure 6.3.9b

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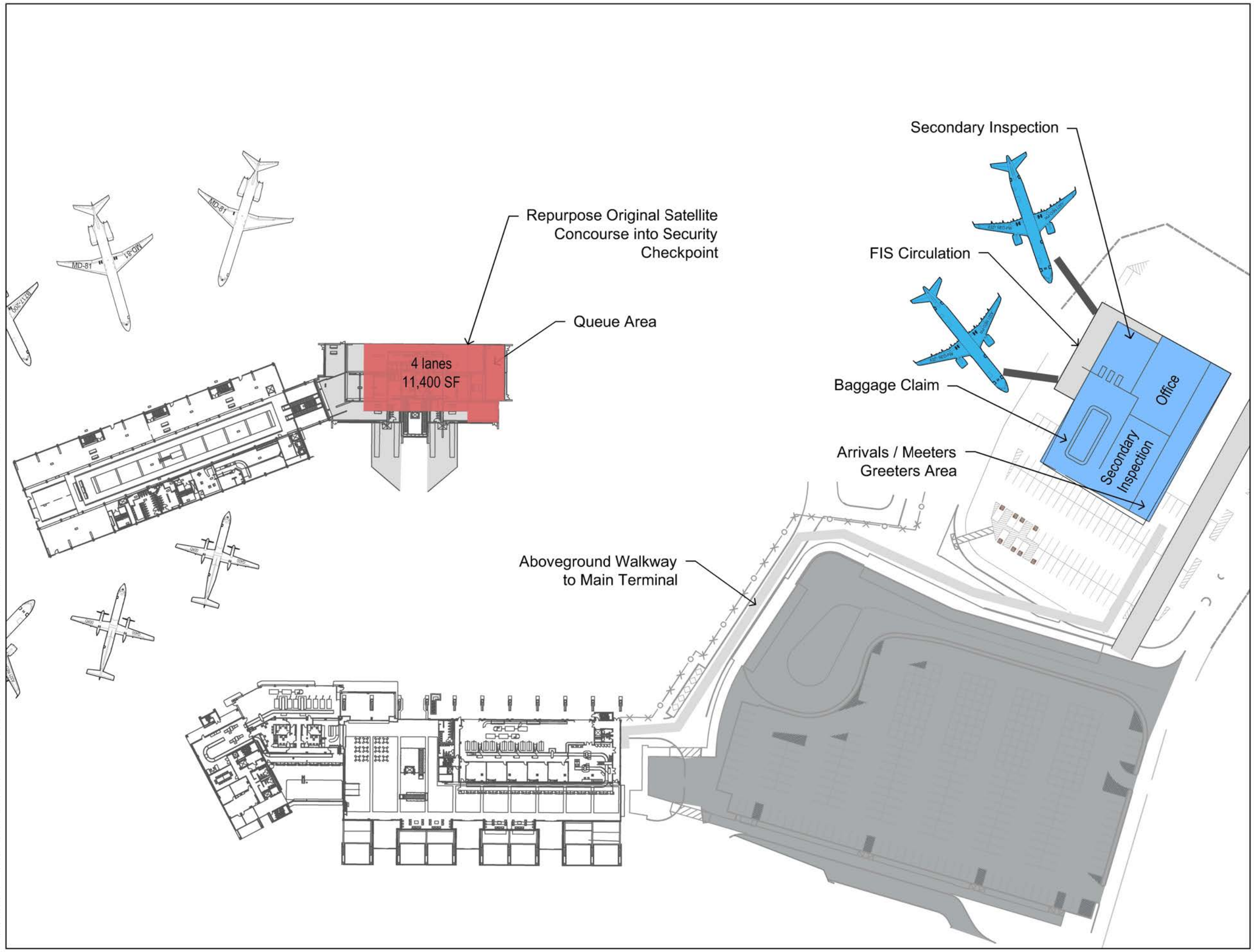

Legend

- Proposed Security Checkpoint
- Proposed Public Circulation
- Proposed FIS

N

Not To Scale

Lehigh Valley International Airport
Master Plan Update

Optimize Old Departure Concourse

Terminal Development Alt. 3A
Figure 6.3.10

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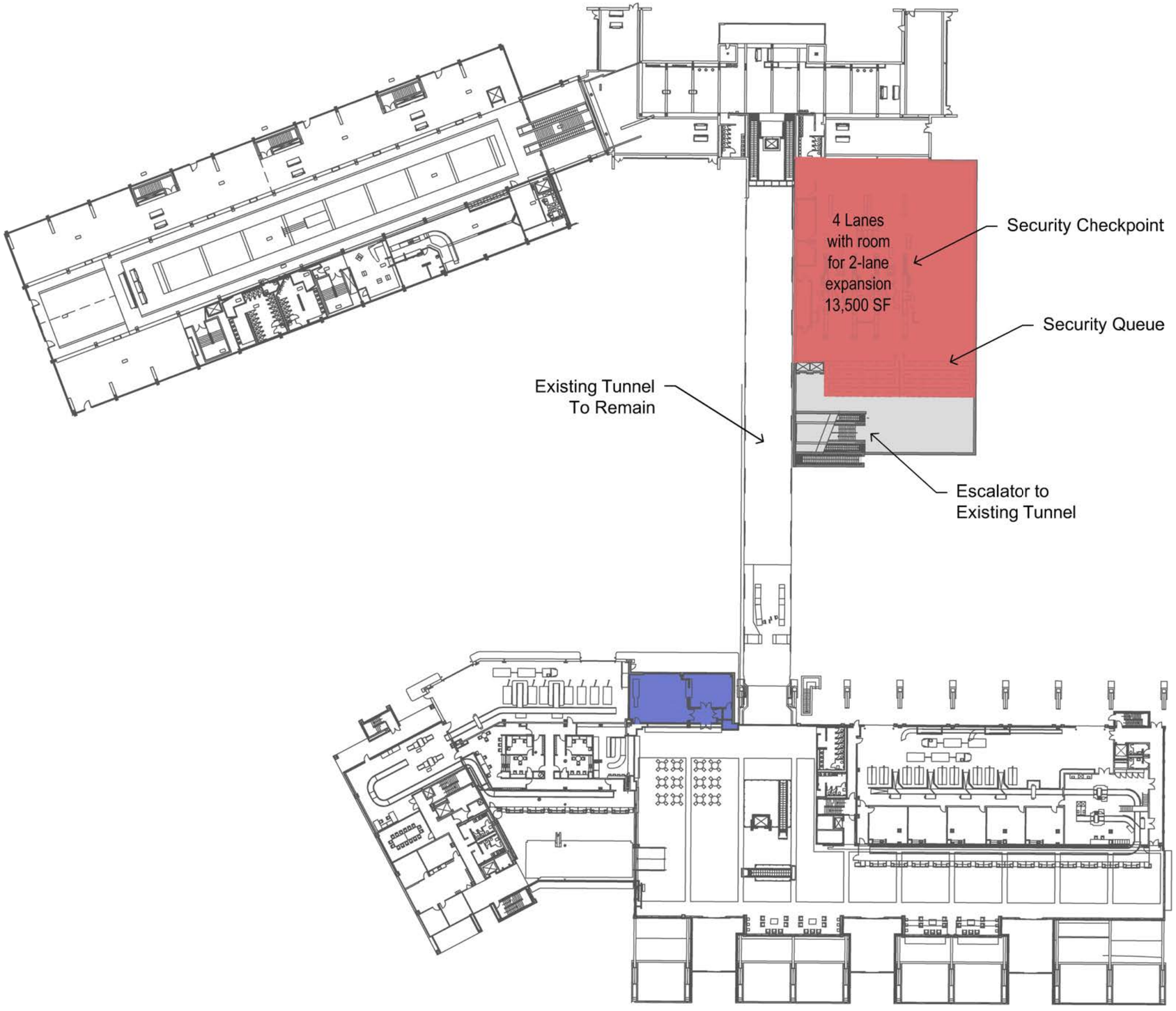

Legend

- Proposed Security Checkpoint
- Proposed Public Circulation
- Proposed Board Room

N

Not To Scale

Lehigh Valley International Airport
Master Plan Update

Expanded Checkpoint with Existing Tunnel

Terminal Development Alt. 3B
Figure 6.3.11

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