# Terminal Planning Study

## Technical Report

**June 2022**

PREPARED FOR

Central West Virginia Regional
Airport Authority

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# 1 Executive Summary

West Virginia International Yeager Airport (CRW) selected Landrum & Brown (L&B) to conduct a Terminal Planning Study to explore options to replace the existing terminal building and assess the impact to the Concourse A gates if Taxiway A is shifted to accommodate a 400-foot separation from Runway 5/23.

The existing building violates the Federal Regulation Title 14 Part 77 (Part 77) obstruction identification surfaces for the airport's sole runway. In addition, four of the nine existing gates prevent the relocation of Taxiway A, which is too close to Runway 5-23 according to Federal Aviation Administration (FAA) design standards. The FAA has temporarily granted a "modification of standards" that enables continued operation of the airport's only runway despite the taxiway location.

The central core of the existing terminal was opened in 1950, prior to the jet age. As a result, many functions of a modern passenger terminal were provided through building additions and renovations. The additions provided further space for baggage reclaim, boarding gates with loading bridges, and passenger holdrooms.

Renovations provided space for passenger and baggage security screening, communications infrastructure, and computer rooms. While the existing terminal accommodates the existing demand of 225,000 annual enplaned passengers, it does so at an insufficient Level of Service (LOS) according to the service standards defined by the International Air Transport Association (IATA) and Airport Cooperative Research Program (ACRP) Report 25.

The existing building has excess space for airport operations/administration and tenant support spaces, airline offices, and Transportation Security Administration (TSA) offices, which does not directly support passenger operations. Thus, while the building only has a space shortage of about 10,000 square feet in terms of area requirements, the actual passenger services areas are about 30,000 square feet short of the amount required to provide an acceptable LOS, or about 35 percent below the need.

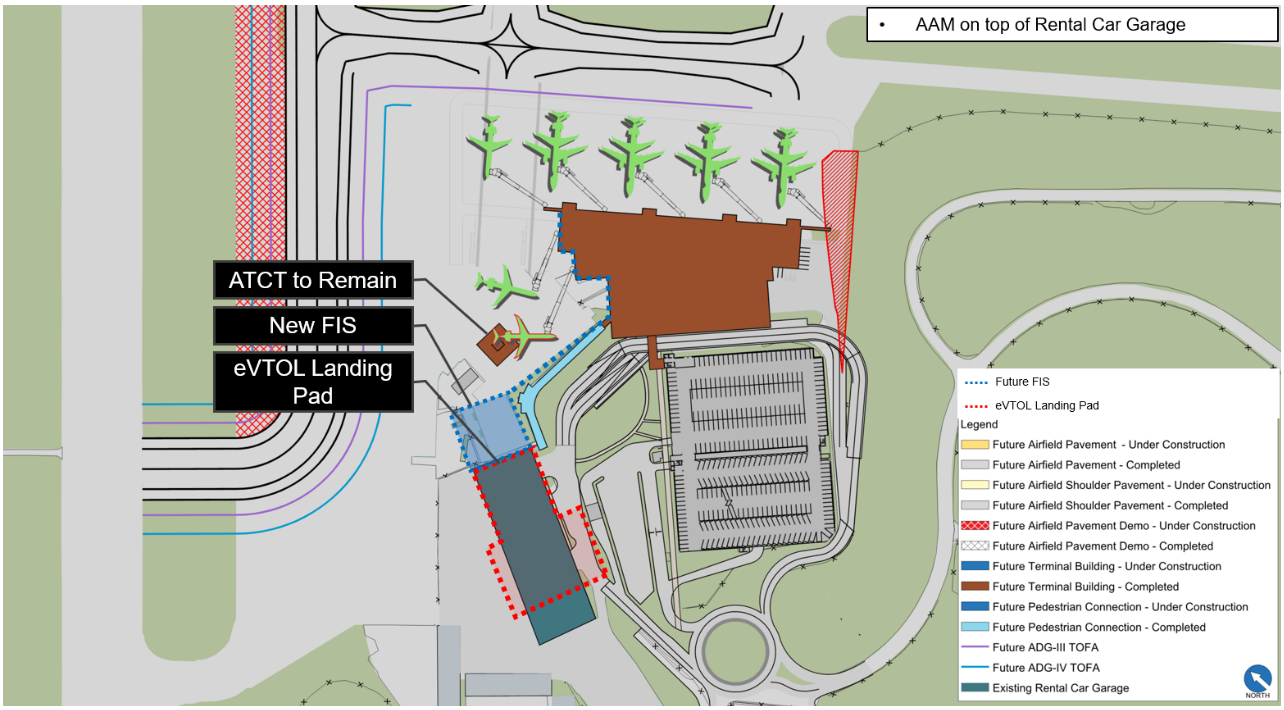
A replacement terminal will comply with the Americans with Disabilities Act (ADA), fully meet TSA security standards, improve energy efficiency, and improve aviation access to historically disadvantaged communities in West Virginia. Putting the passenger terminal on a new site will enable the airport to retire the modification of standard for the portion of Taxiway A in front of the terminal and increase safety.

The replacement terminal will achieve a complete development project by accommodating long-range forecast demand of over 350,000 enplaned passengers with an LOS that meets the service standard defined by IATA. The existing terminal will be demolished except for the portion necessary to enable continued operation of the airport traffic control tower (ATCT).

The proposed passenger terminal building program is estimated to cost approximately $254 million to construct, including design, construction, contingencies, and other soft costs. Based on the estimated terminal development costs, a funding source analysis was developed for CRW. In developing the financial plan, the overriding objective was to identify maximum funding eligibility from each potential funding source to maximize the use of external resources and minimize the amount of funding from CRW funds and local public resources.

CRW has submitted an Airport Layout Plan (ALP) that includes the replacement terminal site plan and is working to complete the required environmental reviews. A plan view of the replacement passenger terminal is shown in **Figure 1**. This terminal plan was developed based on an extensive study of alternate locations for the new terminal as well as variations in the floorplans, curbside roadways, and aircraft parking positions.

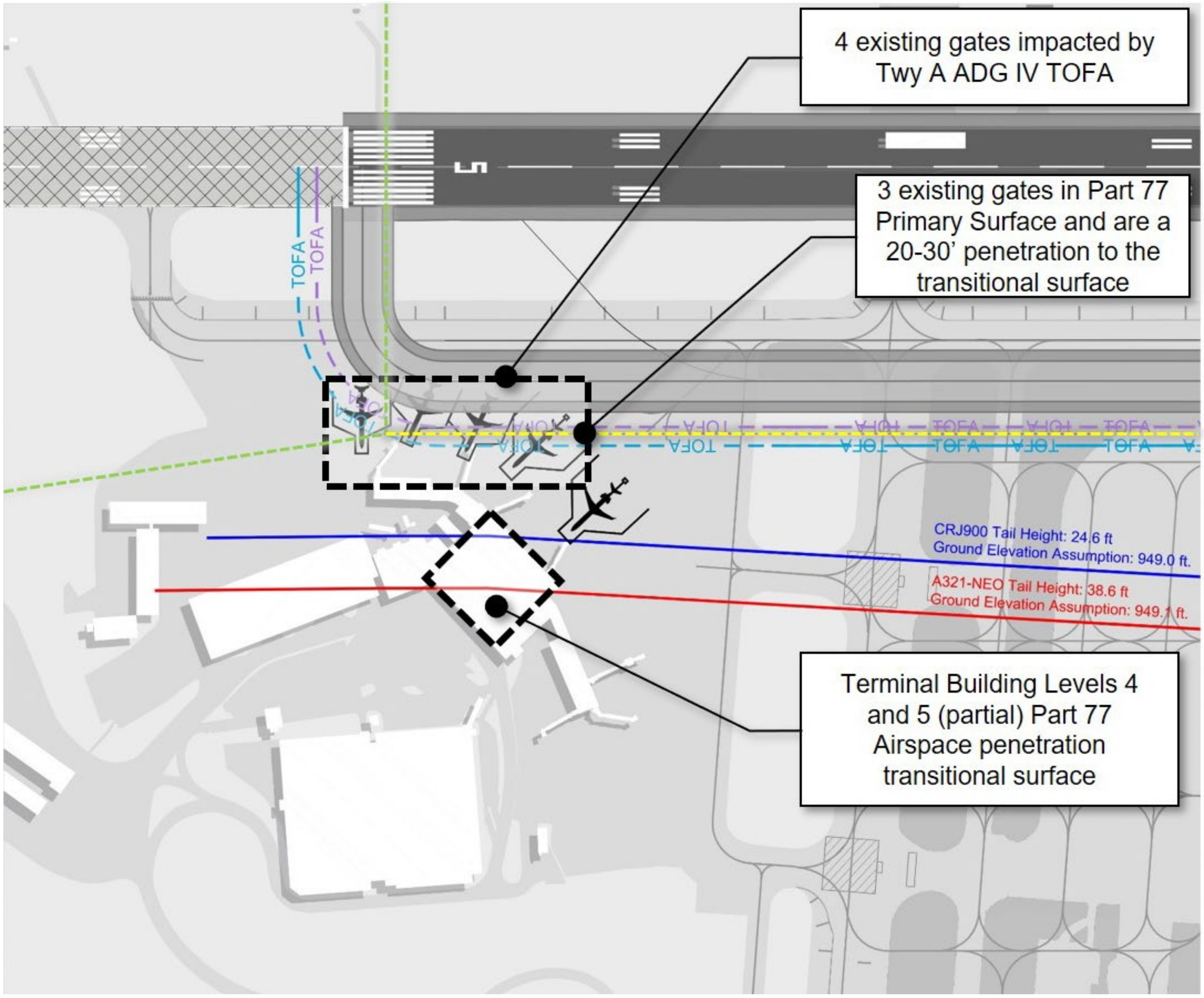
**Figure 1 Replacement Terminal Area Plan**




Note: The opening of the seventh gate is an optional component of the program and depends upon the relocation of the ATCT that is located within the existing terminal building. The relocation of the ATCT is not necessary for the rest of the terminal program. The portion of the existing terminal that supports the ATCT can remain with the replacement terminal using six of its seven gates.
Source: L&B analysis

Relocating the terminal will enable the airport to meet FAA design standards for compliance with Part 77 surfaces and retire modifications of design standards for a portion of Taxiway A. **Figure 2** shows that the existing terminal building and four gates violate obstruction identification surfaces defined by Part 77. Three of the four gates violate the primary runway surface, while using a fourth gate results in aircraft penetrating the transitional surface by 20 to 30 feet, depending upon the type of aircraft using the gate. The passenger terminal building itself violates the transitional surface defined by Part 77.

**Figure 2 Part 77 Penetration**




Source: L&B analysis

Taxiway A is only 300 feet from Runway 5-23. The FAA standard for a parallel taxiway to a precision instrument runway is 400 feet. Relocating Taxiway A to the standard distance would result in the closure of four gates of the terminal, resulting in its inability to accommodate existing aircraft parking demand. The FAA has granted a temporary modification of design standards for Taxiway A, which enables its continued use despite being only 300 feet from Runway 5-23.

# 2 Existing Conditions

CRW was originally dedicated as Kanawha Airport on November 3, 1947. The existing passenger terminal building (shown in **Figure 3**) was finished in July 1950. An addition for the current B gates and passenger seating areas was added in 1970. The baggage claim addition was built in 1974 and additional major renovations to the complex took place in 1982 and 1997. In 1984 part of the A gate concourse was constructed. Kanawha Airport was renamed Yeager Airport in honor of Brig. Gen. Chuck Yeager, a Lincoln County native, on October 14, 1985. The airport was again renamed in 2022 and is now known as West Virginia International Yeager Airport.

**Figure 3 Terminal in the 1950s**


Source: CRW

The terminal was expanded in 2000 to provide the C gates and again in 2005 to provide additional A gates and passenger seating areas. The main lobby was also remodeled to provide more space for passenger security screening by TSA. In 2010, a protective canopy was installed over the curbs in front of the terminal. About 60 percent of the current building dates from 1950. **Figure 4** shows the 2021 version of the terminal.

**Figure 4 Terminal in 2021**

Source: CRW Airport

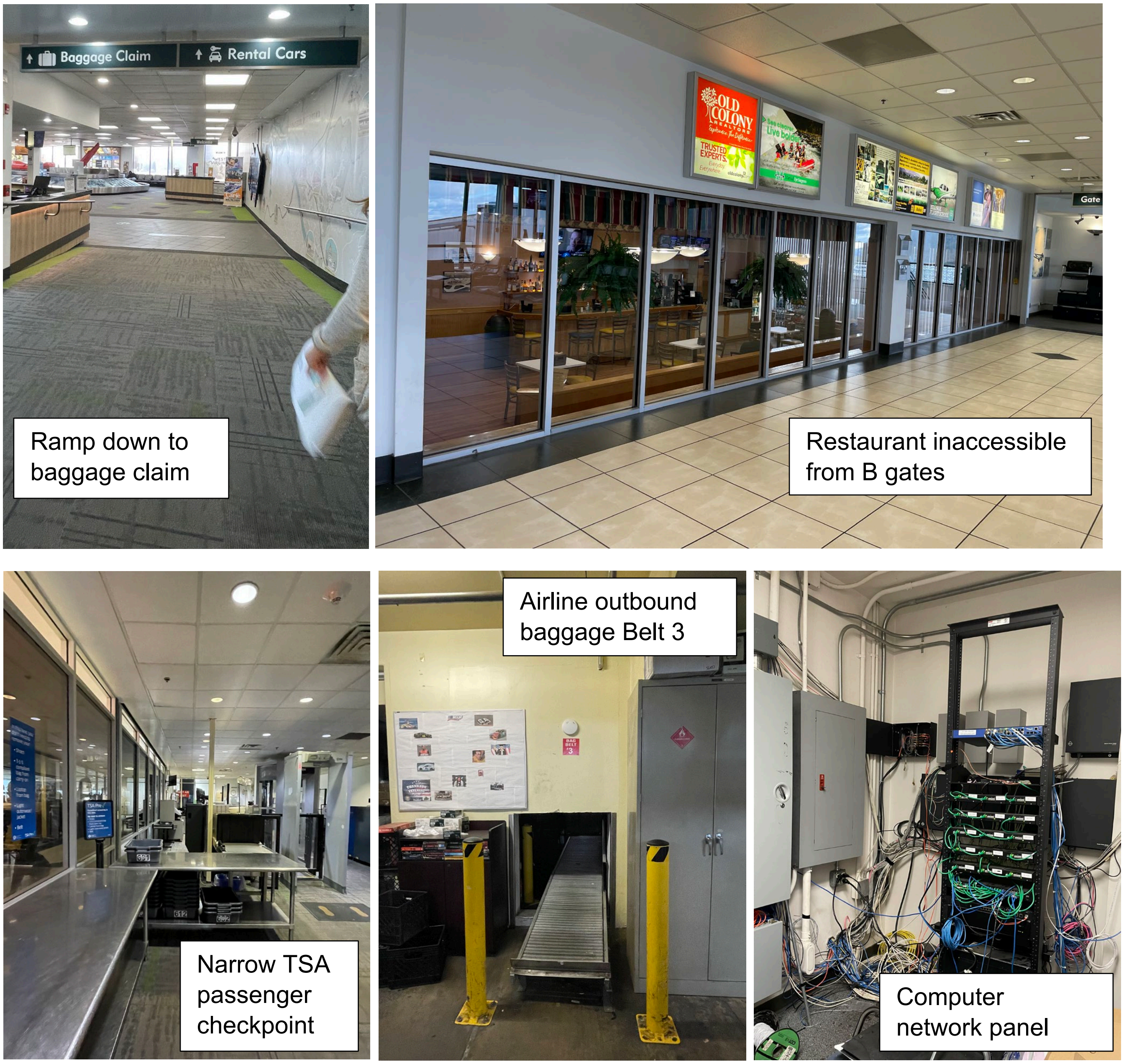
The various additions were built on three different levels. The A and C gate areas provide ground level holdrooms, while the B gates provide second level holdrooms. The second level B gate areas are lower than the ground level ticketing hall in the original building. The bag claim area built in 1974, while at ground level, is lower than the ticketing hall. Perhaps the most striking level change is the restaurant which is half a floor lower than the gate areas immediately adjacent to it.

As a result of the incremental expansion of a 1950 building, the following issues were created:

- Numerous corridors have ramps or steps to connect areas on multiple levels
- Level changes complicate compliance with ADA regulations so that not all areas are fully accessible
- Gate holdrooms are isolated from concessions, which depresses revenue
- Passenger routing through the terminal is circuitous and not intuitive
- Low ceilings in some areas make signage difficult to place
- Building HVAC systems are old and energy inefficient
- Telecommunications and computer rooms are cramped, scattered, inefficiently placed, and difficult to secure
- Baggage areas are small and inefficiently located
- Security screening areas for passengers and bags are cramped, inefficient, and do not meet TSA space standards
- Single security lane precludes establishing a separate TSA Pre-Check screening process and cannot accommodate new Credential Authentication Technology (CAT).

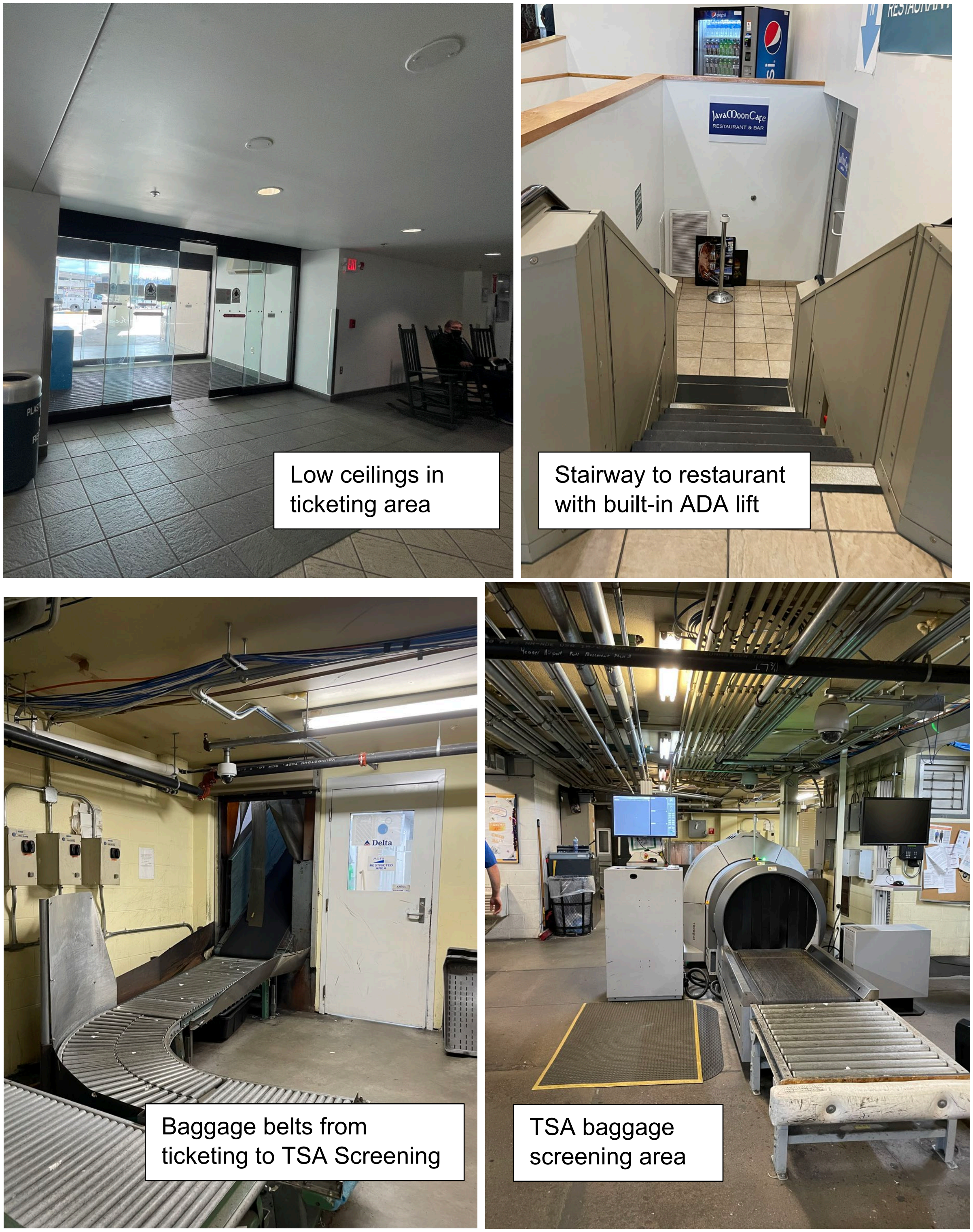
Examples of these inefficiencies due to incremental design are shown in **Figure 5** through **Figure 7**.

**Figure 5 Examples of Inefficiencies**




Source: L&B Photos

**Figure 6 Examples of Inefficiencies (Continued)**



Low ceilings in ticketing area

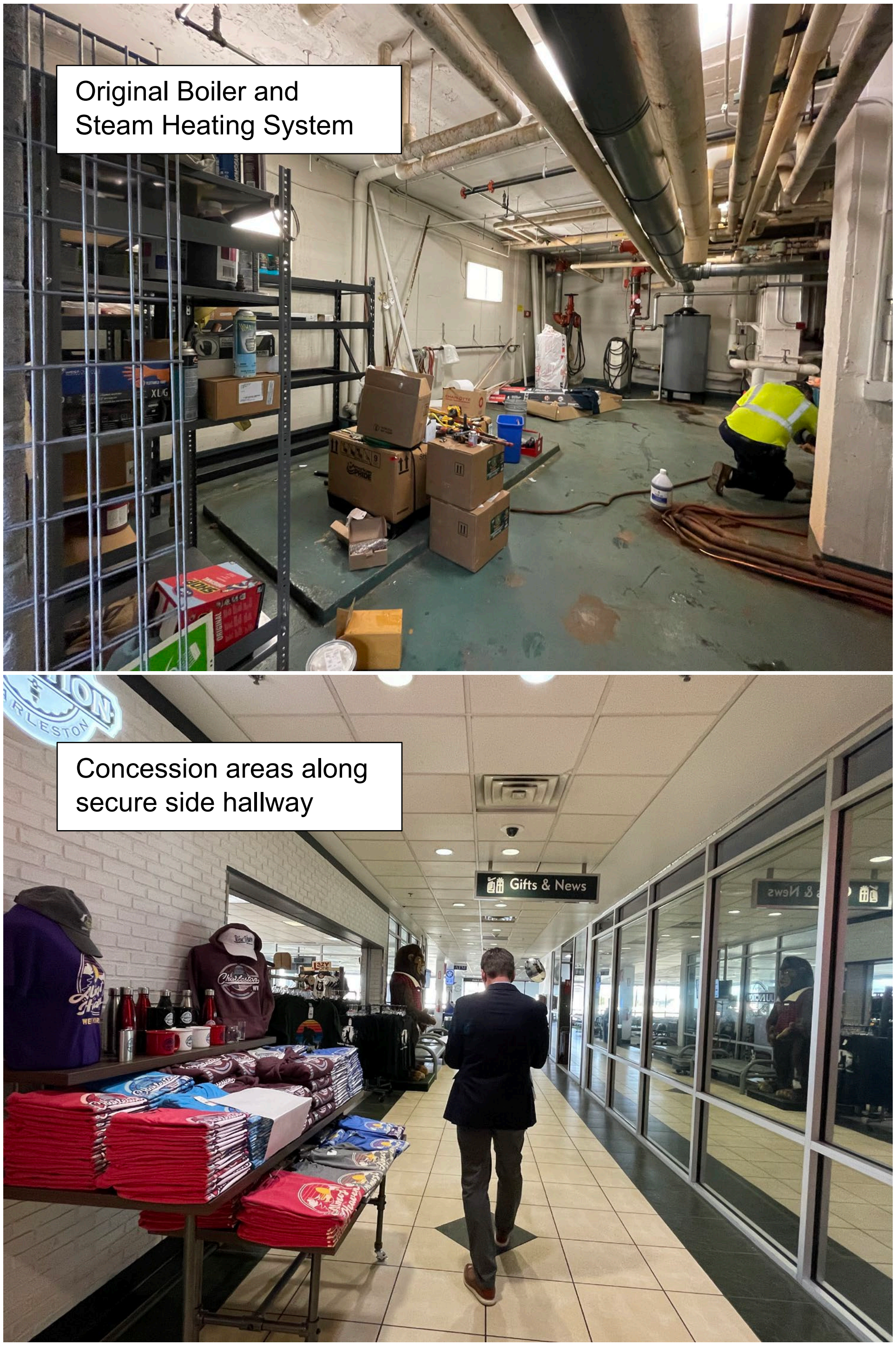
Stairway to restaurant with built-in ADA lift

Baggage belts from ticketing to TSA Screening

TSA baggage screening area

Source: L&B Photos

**Figure 7 Examples of Inefficiencies (Continued)**




Source: L&B Photos

# 3 Aviation Forecast

## 3.1 Recovery of Airport Traffic After the Pandemic

According to the FAA Terminal Area Forecast (TAF) the airport served 224,747 enplaned passengers in 2019. The pandemic reduced enplaned passenger volumes in 2020 to 89,224. As the pandemic eased in the last three quarters of 2021, enplaned passenger volumes recovered to 146,355 in 2021. The checkpoint throughput information shown in **Table 1** demonstrates the effect the COVID-19 pandemic had on airport passenger volumes in 2020; it also shows that passenger volumes started recovering in 2021. With the pandemic starting to wane in February and March of 2022, further traffic recovery is expected. A full recovery of traffic volumes seems reasonably foreseeable by 2023 or 2024.

**Table 1 CRW Airport Monthly Checkpoint Throughput**

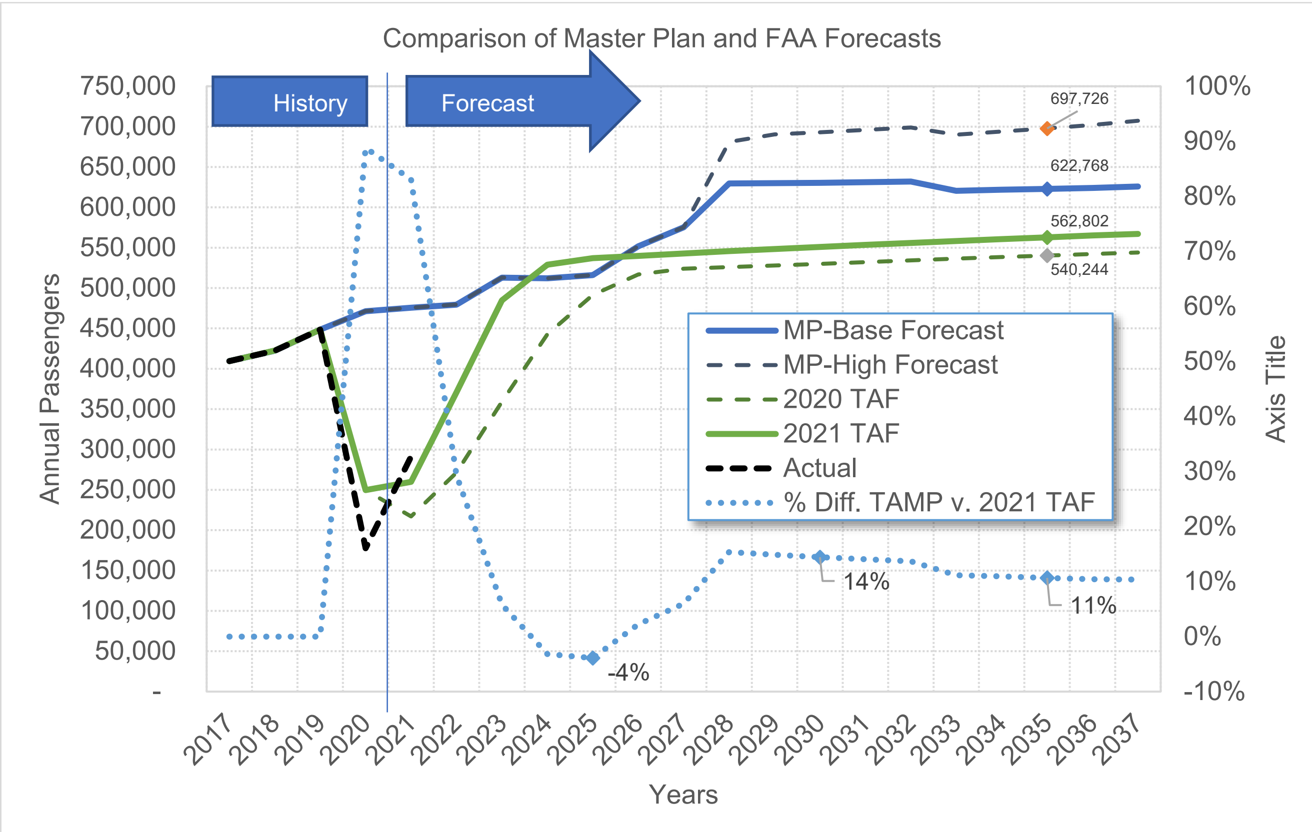
| Months | 2019 | 2020 | 2021 |
|---|---|---|---|
| January | 16,995 | 18,223 | 7,169 |
| February | 16,394 | 17,917 | 7,501 |
| March | 20,371 | 10,931 | 11,675 |
| April | 20,351 | 1,580 | 13,492 |
| May | 24,462 | 2,919 | 17,885 |
| June | 23,901 | 4,818 | 19,065 |
| July | 23,740 | 8,188 | 19,557 |
| August | 24,079 | 8,002 | 15,434 |
| September | 21,928 | 8,503 | 15,429 |
| October | 23,557 | 9,832 | 14,812 |
| November | 21,343 | 9,083 | 14,809 |
| December | 8,853 | 16,118 | 16,118 |
| **Annual Total** | **257,682** | **108,849** | **172,946** |
| **Annual Enplaned** | **224,747** | **89,224** | **146,355** |
| **Percent Enplaned** | **87%** | **82%** | **85%** |

Source: https://www.tsa.gov/foia/readingroom, CRW Monthly Reports, and L&B analysis

## 3.2 Demand Basis of Terminal Planning

The evaluation of existing terminal functionality is based on 2019 peak hour and peak day passenger volumes. The basis for planning the future replacement passenger terminal is based upon on the high case Master Plan forecast for 2037. The annual demand forecasts are summarized in **Figure 8**. Also shown in the figure are actual volumes for 2020 and 2021 from CRW monthly reports. This analysis shows the recovery from the pandemic is proceeding about two years faster than initially forecast. The figure also shows the five-year forecast from the 2021 FAA TAF and the Master Plan are about four percent different, the ten-year forecast is about 14 percent different and the fifteen-year forecast is about 11 percent different.

**Figure 8 Comparison of FAA Master Plan Forecasts**




Notes: 2017-2021 Passengers are from CRW Monthly Reports.
FAA Forecasts are of enplaned passengers. Presented here as total passengers (enplaned times two).
Source: FAA 2021 TAF, CRW Master Plan, and L&B analysis

The figure shows that the 2019 actual annual passenger level was 448,528 and the high forecast for 2037 is anticipated to be 707,300 passengers. An analysis of the ratio between annual demand and peak month demand during 2014-2019 determined that demand during the peak month is on average between 9.0 and 9.4 percent of annual, with the average being 9.2 percent. Therefore, the forecast peak month volume of passengers for 2037 is estimated to be about 65,100. Using flight schedules from 2019 and 2021 as a base, an average weekday forecast volume of 2,800 passengers on 48 flights was estimated, which is 4.3 percent of the peak month. The peak hour is anticipated to be 500 passengers, which is 18 percent of the daily volume. The peak arrival and the peak departure hours are anticipated to have 260 passengers.

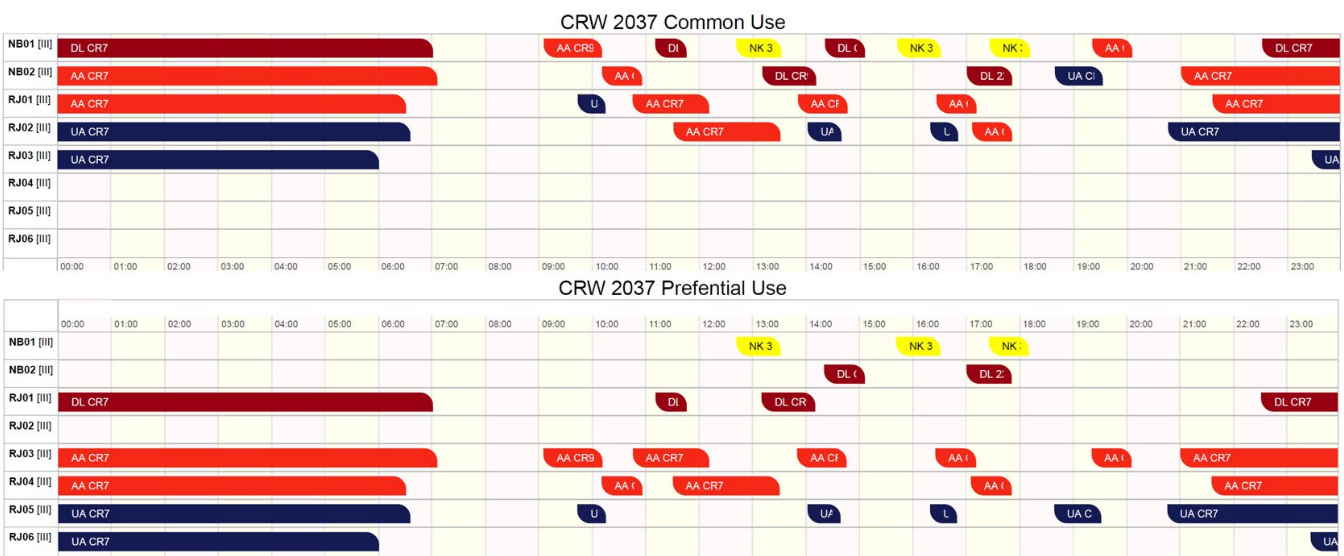
Despite the overall traffic decline during the pandemic, one carrier, Spirit Airlines, added service by increasing the size of their aircraft from A319 to A320 aircraft, and by adding a second destination (Orlando). As the pandemic eases and demand returns to pre-pandemic levels, the forecast anticipates other carriers will resume service to previously served hubs. The current shortage of pilots may slow the return of service, especially by the regional partners of the large air carriers. However, over the longer term, the pilot shortage should be resolved, and air service patterns should return to normal.

## 3.3 Gate Analysis and Demand

In correlation to the peak month average weekday (PMAWD) passenger projections, the number of gates and holdrooms required to meet the 2037 high forecast demand was estimated by evaluation of a future design day flight schedule (DDFS). Historical DDFSs were prepared from a busy PMAWD in 2015, 2019, and 2021 for comparison; the 2019 DDFS was used as the basis for building a projected future 2037 schedule and includes anticipated additional markets at CRW with the expected future aircraft in the fleet. A benchmark study of airports with passenger levels of roughly 700,000 to 1.0 million annual passengers, and having comparable populations and regional economies, was performed to evaluate reasonable increases in markets served, frequency of service, and aircraft usage. The 2037 high forecast DDFS was prepared assuming the inclusion of one additional leisure flight by an Ultra Low Cost Carrier (ULCC), and the expected return of past regional hub connections (e.g., IAD, DFW, and LGA) and pre-pandemic frequencies by Delta and United with a fleet of mainly large regional jets (CR7, CR9). Spirit flights were all assumed to be narrowbody jets, and Delta was assumed to upgauge at least one peak day flight to a narrowbody jet in the DDFS.

**Figure 9** presents the prepared future flight schedule gating requirements with common use and preferential use policies for comparison.

**Figure 9 2037 High Case DDFS Gate Charts**




Source: L&B analysis

**Table 2** provides a general overview and summary of PMAWD operations and gate demand from the existing 2021 baseline (the 2019 DDFS and 2021 DDFS had consistent gate requirements amid different annual traffic levels) and the future 2037 forecast needs. The 2037 high forecast DDFS projects 48 flights with a requirement of seven gates at CRW under a preferential gate leasing policy, and a minimum of five gates if all carriers operate with common use gate leases.

**Table 2 CRW Gating Requirements Summary**

| Type | Year | Annual Pass. | Annual Ops. | Design Day Ops. | Peak Hour Ops. | Common Use Gates | Preferential Use Gates |
|---|---|---|---|---|---|---|---|
| Existing | 2021 | 334,000 | 6,878 | 24 | 5 | 4 | 5 |
| MP Base | 2037 | 625,900 | 12,588 | 38 | 7 | 5 | 6 |
| MP High | 2037 | 707,300 | 13,665 | 48 | 7 | 5 | 7 |

Source: L&B analysis

CRW currently only has two gates that have sufficient size to accommodate the B737/A320 size aircraft used by ULCCs. The remaining gates only accommodate regional jet aircraft. During the pandemic, Spirit Airlines (ULCC) actually increased service frequency and the gauge of their aircraft (from A319 to A320) that serve CRW. Other ULCCs have expressed interest in serving CRW, and it is anticipated a traditional carrier will resume B737 service or add service on the A220 with the waning of the pandemic. CRW needs additional large gates to accommodate the larger aircraft expected in the demand forecast.

# 4 Terminal Space Program

While the existing terminal accommodates demand, it does so at an insufficient LOS according to IATA and ACRP Report 25 Standards:

- The security screening checkpoints, while functional, do not meet TSA design and space standards
- Level changes and ramps make passenger flow circuitous and inefficient
- Airline outbound baggage space is insufficient to meet existing demand
- Checked baggage screening areas, while functional, do not meet TSA design and space standards
- Baggage reclaim space is insufficient to meet existing demand
- Airline operations spaces are insufficient to meet existing needs

A replacement terminal will accommodate long-range forecast demand with a LOS that meets the service standard defined by IATA and ACRP Report 25 (Optimum LOS).

## 4.1 Program Overview

The central core of the existing terminal was opened in 1950, prior to the jet age. As a result, many functions of a modern passenger terminal were provided through building additions and renovations. The additions provided further space for baggage reclaim, boarding gates with loading bridges, and passenger holdrooms. Renovations provided space for passenger and baggage security screening, communications infrastructure, and computer rooms.

The acceptable LOS (Optimum) for this assessment is based on the recommendations of ACRP Report 25 – Planning of Passenger Terminals and the IATA Airport Planning Guidebook, as shown in **Figure 10**.

**Figure 10 IATA Guidelines**

| LoS Guidelines | | SPACE GUIDELINES [sqm/PAX] | | | MAXIMUM WAITING TIME GUIDELINES Economy Class [minutes] | | | MAXIMUM WAITING TIME GUIDELINES Business Class / First Class / Fast Track [minutes] | | | OTHER GUIDELINES & REMARKS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LoS Parameter: | Over-Design | Optimum | Sub-Optimum | Over-Design | Optimum | Sub-Optimum | Over-Design | Optimum | Sub-Optimum | Over-Design | Optimum | Sub-Optimum |
| Public Departure Hall | | >24.8 | 21.5-24.8 | <21.5 | | n/a | | | n/a | | Optimum proportion of seated occupants: | 15-20%* | |
| Check-In | Self -Service Kiosk (Boarding Pass / Bag Tagging) | >19.4 | 14.0-19.4 | <14.0 | <1 | 1-2 | >2 | <1 | 1-2 | >2 | | | |
| | Bag Drop Desk (queue width: 1.4- 1.6m) | >19.4 | 14.0-19.4 | <14.0 | <1 | 1-5 | >5 | <1 | 1-3 | >3 | | | |
| | Check-in Desk (queue width: 1.4- 1.6m) | >19.4 | 14.0-19.4 | <14.0 | <10 | 10-20 | >20 | <3 | Business Class 3-5 | >5 | | | |
| | | | | | | | | <1 | First Class 1-3 | >3 | | | |
| Security Control (queue width: 1.2m) | | >12.9 | 10.8-12.9 | <10.8 | <5 | 5-10 | >10 | <1 | First Track 1-3 | >3 | | | |
| Gate Holdrooms | Seating | >23.7 | 19.4-23.7 | <19.4 | | n/a | | | n/a | | Optimum proportion of seated occupants: 50-70%* | | |
| | Standing | >16.1 | 12.9-16.1 | <12.9 | | | | | | | | | |
| Baggage Reclaim | Narrow Body Aircraft | >18.3 | 16.1-18.3 | <16.1 | <0 | 0/15 | >15 | <0 | 0/15 | >15 | The first waiting time value relates to "first passenger to first bag". The second waiting time value related to "last bag on belt" (counting from the first bag delivery).** | | |
| | Wide Body Aircraft | >18.3 | 16.1-18.3 | <16.1 | <0 | 0/25 | >25 | | | | | | |
| Public Arrival Hall | | >24.8 | 21.5-24.8 | <21.5 | | n/a | | | n/a | | Optimum proportion of seated occupants: | 15-20%* | |

Source: IATA ADRM 11th Edition

**Table 3** and **Table 4** list the program parameters that were used to develop the area requirements for the new terminal. These parameters include the wait time standards, area requirements, and passenger type ratios used to drive the mathematical formulas in the terminal space program.

As shown in **Table 5**, the existing spaces for many terminal functions are insufficient to accommodate existing demand at an acceptable LOS. The most pressing needs for space include airline baggage operations for both arriving and departing bags and secure side circulation spaces.

The existing building has excess space for airport operations/administration and tenant support spaces, airline offices, and TSA offices. Much of this space does not directly support passenger operations. Thus, while the whole building has a space shortage of about 10,000 square feet, the actual passenger services areas are about 30,000 square feet of the amount required to provide an acceptable LOS, or about 35 percent below the need. In addition, these administration spaces are not in a dedicated area and are, therefore, not an efficient use of space.

The existing terminal was constructed prior to having any considerations for aviation security beyond having a fence between the airfield and the surrounding areas. Thus, spaces for passenger screening and baggage screening by the TSA are far from adequate based on TSA space guidelines.

The amount of space needed for 2037 demand is approximately 60 percent more than the existing building. More importantly, the 2037 building program allocates space to meet more modern needs versus those of a 1950s operation.

**Table 3 Program Parameters**

| Check-in | |
|---|---|
| **Passengers** | |
| Ratio of Passengers in Business/First Class | 10% |
| Ratio of Self Check Passengers (Kiosks) | 40% |
| Ratio of Passengers Using Traditional Check-in Facilities | 40% |
| Ratio of Passengers Using Home Check-in (App Check-in) | 20% |
| Ratio of Total Passengers Using Bag Drop | 35% |
| Additional Counters to Account for Schedule Changes | 15% |
| **Self Service Kiosks** | |
| Average Process Time per Pax (in seconds) | 80 |
| Maximum Queuing Time (in minutes) | 3 |
| Area Required per Kiosk Including Queue | 50 |
| **Bag Drop** | |
| Average Process Time per Passenger (in seconds) | 60 |
| Maximum Queuing Time (in minutes) | 5 |
| **Traditional Check-in** | |
| Average Process Time per Passenger (in seconds) | 90 |
| Maximum Queuing Time (in minutes) Y class | 20 |
| Maximum Queuing Time (in minutes) J class | 5 |
| Maximum Queuing Time (in minutes) F class | 5 |
| **Security** | |
| **Departure Screening** | |
| Standard | 75% |
| TSA PreCheck | 25% |
| % Additional Traffic (employees, crew) | 10% |
| Process (throughput) Time per Passenger at Security (in seconds) | 24 |
| Maximum Queuing Time (in minutes) | 10 |
| Support Areas as % Security Hall | 17% |

Source: L&B analysis

**Table 4 Program Parameters (Continued)**

| Baggage Claim | |
|---|---|
| Average Claim Device Occupancy per Code C (in minutes) | 30 |
| Length of Bag Claim Exposure to Passengers per Code C (LF) | 150 |
| Area per Incline Type Unit for Code C (SF) | 4,200 |
| **Baggage Drop-Off** | |
| Area per Unit for Code C (SF) | 1,650 |
| **Gate Lounges** | |
| Individual Lounges | |
| Area per Large NB (SF) | 3,000 |
| Area per Small NB (SF) | 1,560 |
| **Concessions** | |
| Area per Million Passengers (SF) | 8,000 |
| Total Retail | 45% |
| Retail Airside | 90% |
| Retail Landside | 10% |
| Total F&B | 55% |
| F&B Airside | 90% |
| F&B Landside | 10% |
| **Concessions Support** | |
| % of Total Concessions for Storage (25% -35% typical) | 10% |
| **Support** | |
| **Airline Operations** | |
| Area per EQA (SF) | 1,000 |
| **Airline Ticket Offices** | |
| Area per EQA (SF) | 58 |
| **Airline Baggage Service Offices** | |
| Area per Terminating Peak Hour Passenger (SF) | 1.50 |
| **Airport Operations** | |
| Area per EQA (SF) | 600 |
| **Mechanical / Electrical (as % of Total Building)** | 10% to 12% |
| **Vertical Circulation** | 0% to 5% |
| **Miscellaneous (Two Level)** | 0% to 10% |

Source: L&B analysis

### Table 5 Terminal Space Program

| Space Designation | Existing | | 2021 Program | | Program 2037 High | |
|---|---|---|---|---|---|---|
| | Unit | SF | Unit | SF | Unit | SF |
| Check-in | 16 | 5,074 | 8 | 2,740 | 12 | 4,010 |
| Airline Offices | | 3,297 | | 750 | | 1,050 |
| Baggage Make-up / Drop-off | | 5,263 | | 21,210 | | 26,360 |
| CBIS/CBRA Checked Bag Screening | | 1,938 | | 7,050 | | 7,200 |
| Baggage Claim | 1 | 3,873 | 2 | 8,430 | 2 | 8,450 |
| Hold Rooms | | 14,410 | | 7,800 | | 13,800 |
| Business Lounge | | | | 3,240 | | 5,220 |
| Airline Operations | | 1,166 | | 5,320 | | 7,760 |
| Non-Secure Circulation / Lobbies | | 13,497 | | 5,166 | | 8,414 |
| Secured Circulation | | 3,486 | | 19,458 | | 29,187 |
| Restrooms | | 3,592 | | 4,850 | | 5,750 |
| Security Screening Checkpoint | 2 | 1,813 | 2 | 3,600 | 2 | 5,400 |
| TSA Offices | | 2,391 | | 620 | | 920 |
| Concessions | | 4,434 | | 2,590 | | 6,260 |
| Airport Operations / Administration | | 11,233 | | 7,557 | | 11,733 |
| Tenant Spaces | | 13,451 | | - | | |
| Vertical Circulation | | 4,568 | | 1,690 | | 4,060 |
| MEP/Support | | 5,689 | | 6,750 | | 16,210 |
| Loading Dock | | | | 750 | | 750 |
| **Total Areas** | | **99,175** | | **109,570** | | **162,534** |

Notes: Red numbers indicate existing spaces that are too small to accommodate existing (2019) demand at an acceptable LOS (IATA Optimum).
Existing TSA operations spaces do not meet TSA space standards for existing passenger demand.
Source: L&B analysis using ACRP Report 25 and IATA Terminal Planning Guidance

# 5 Security Checkpoint Analysis

The TSA and CRW have the option to temporarily expand the existing checkpoint prior to construction of the checkpoint at the new terminal, which will not occur until later phases of the new terminal program. This optional task will only occur if TSA needs the additional space of the temporary location to accomplish their passenger screening task.

The TSA may be required to upgrade screening equipment including Computed Tomography (CT). It is possible to expand the checkpoint into the existing circulation area and allow one screening lane to upgrade to CT equipment, as shown in **Figure 11**. This layout shows an interim condition where passengers flow through the new concourse's expanded checkpoint. Space must be maintained for the arrival flow of passengers from the new concourse to the existing exit locations.

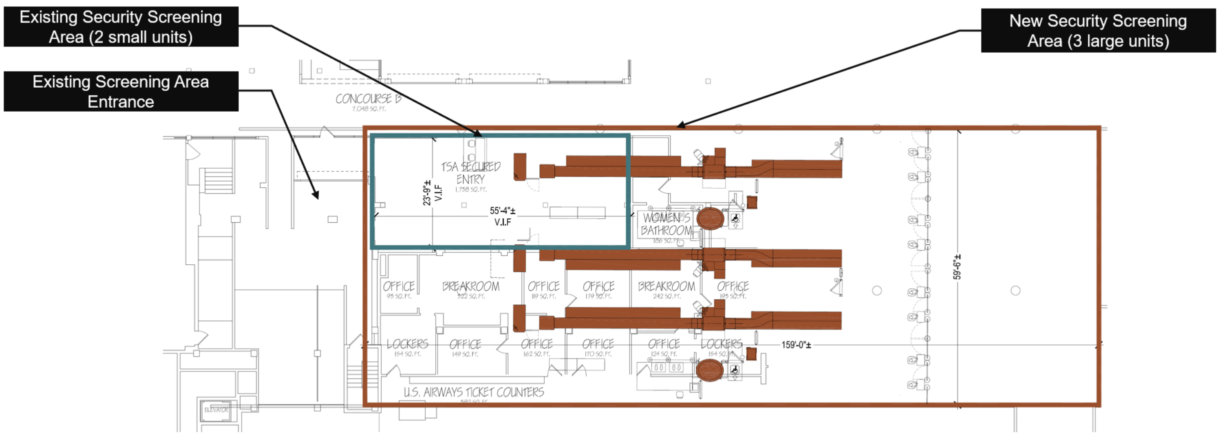
The checkpoint could be further expanded, as needed, to accommodate additional checkpoint upgrades and improved spacing, impacting the existing holdrooms and concession spaces. However, circulation space would need to be maintained for the arrivals flow from the new concourse to the existing exit.

**Figure 11 Existing Checkpoint Expansion Alternative**


Source: L&B analysis

**Figure 12** shows the proposed new terminal checkpoint with the latest TSA recommended lane spacing overlaid on top of the existing checkpoint. The purpose of this exhibit is to demonstrate how deficient the existing checkpoint is in terms of size and lane spacing. A checkpoint of this size could fit within Concourse B if the entire width from the existing checkpoint to the window wall was utilized.

**Figure 12 Checkpoint Size Comparison**




Source: L&B analysis

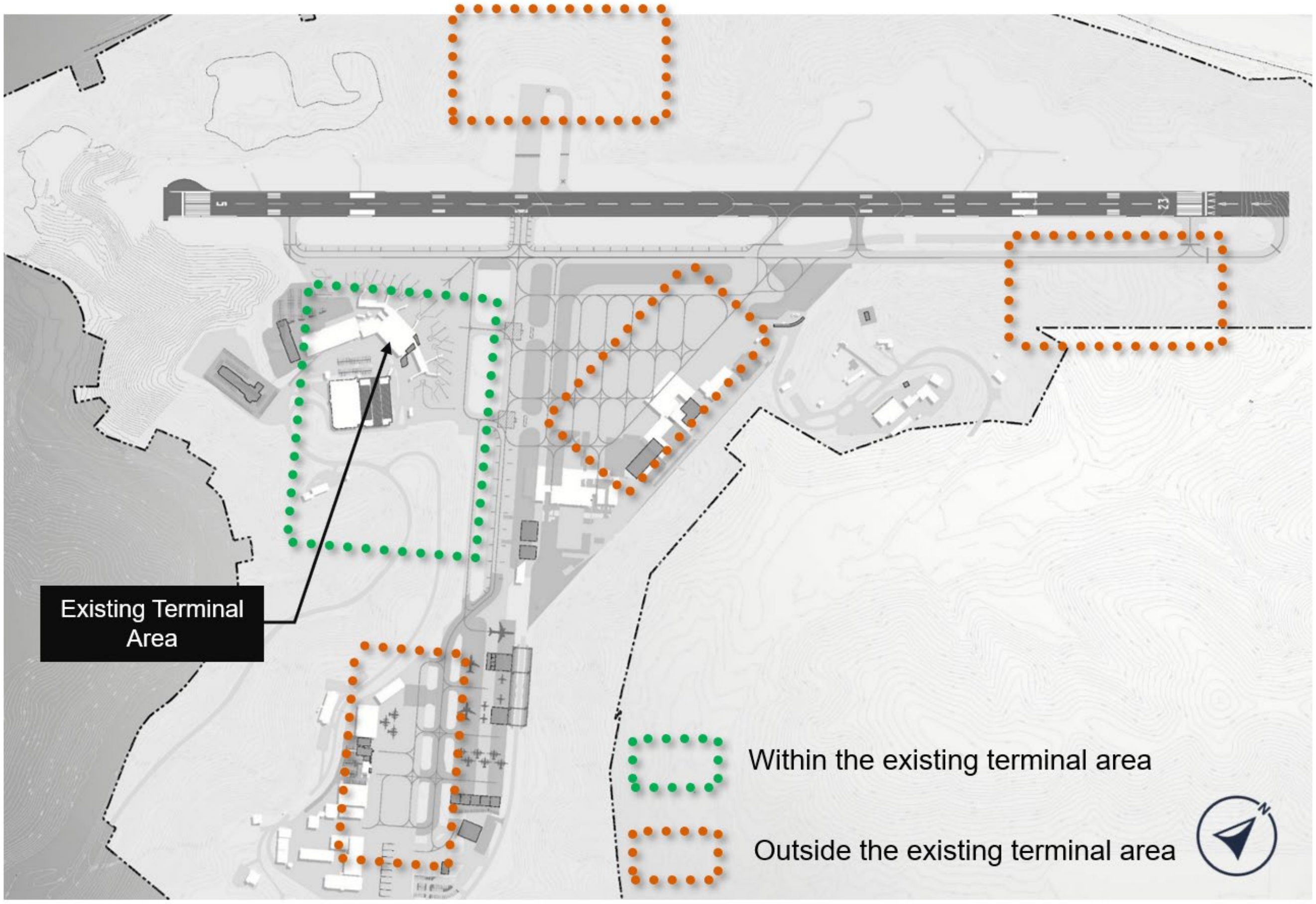
# 6 Concept Development and Evaluation

A site selection process evaluated potential locations to construct a new terminal. This process eliminated sites outside of the existing terminal area due to fatal flaws. The existing terminal area was identified as the optimal location for a new replacement terminal. A series of terminal layouts were developed to identify the best orientation of the terminal, roadways, and aircraft positions. Once the site selection process was complete, a preferred new terminal layout was developed and refined.

## 6.1 Site Evaluation

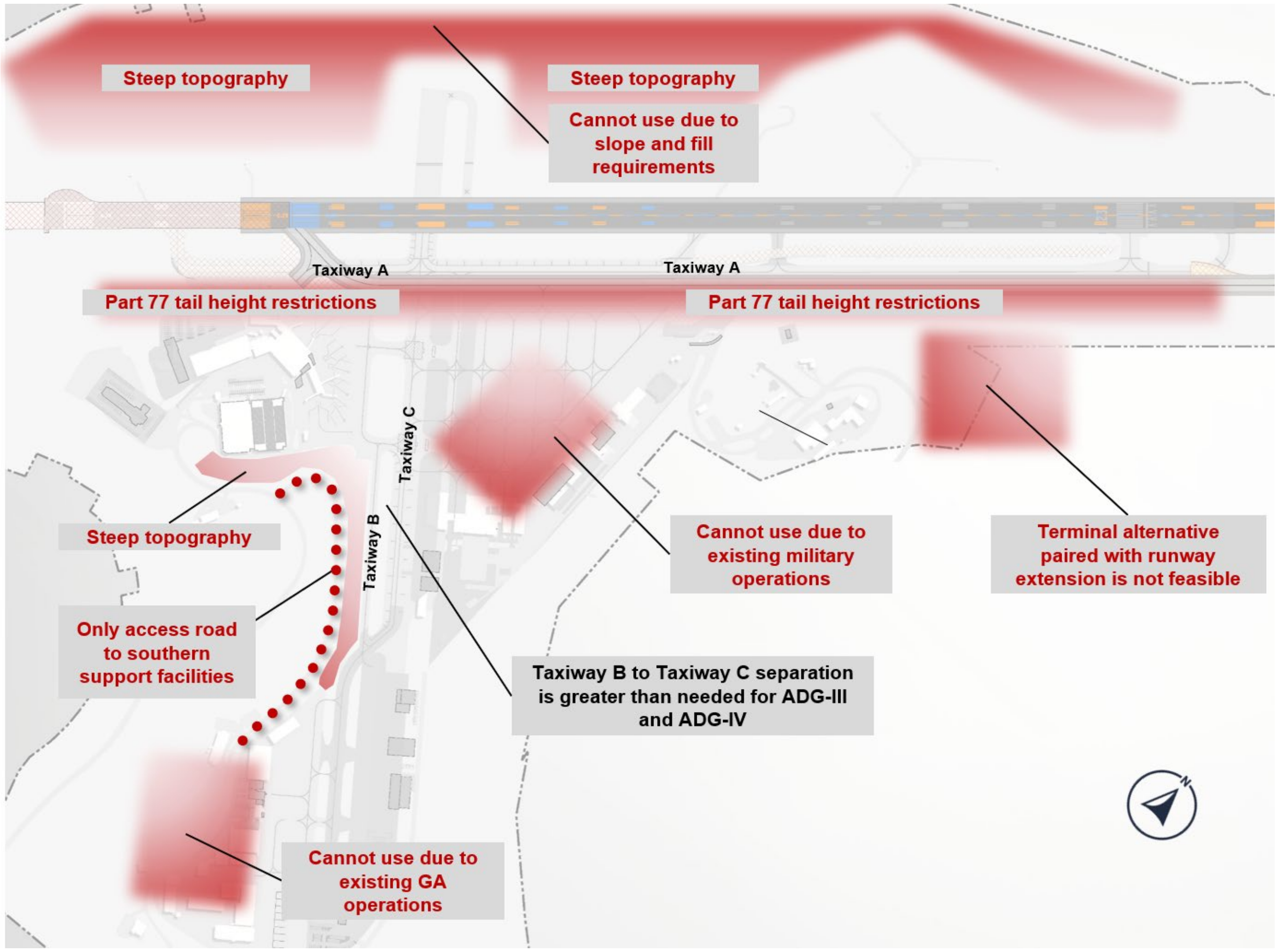
The site evaluation process began by reviewing all potential locations for a new terminal, including areas within and outside of the existing terminal area. **Figure 13** shows the site areas considered. The areas identified as outside the existing terminal area were eliminated due to fatal flaws, including cost, accessibility, and impact to existing facilities as shown in **Figure 14**. The purpose of this exercise was to confirm that the most optimal site was within the existing terminal area.

**Figure 13** **Site Evaluation**




Source: L&B analysis

**Figure 14 Site Constraints**

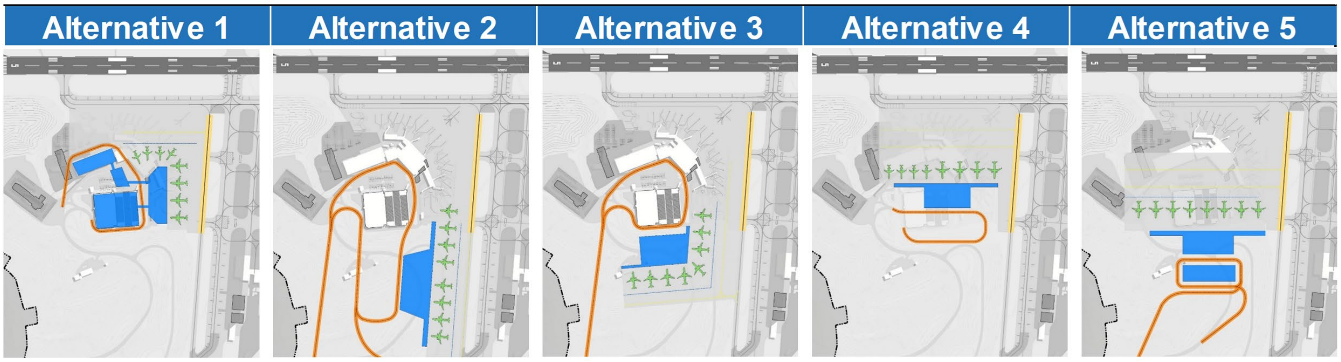



Source: L&B analysis

## 6.2 Site Selection

The next step was to identify the optimal site and configuration of a new terminal. Five alternatives were developed, shown in **Figure 15**. The purpose of this effort was to determine the best location for the new terminal, access roadways, and aircraft parking positions. Numerous criteria were considered in the evaluation process, shown in **Figure 16**.

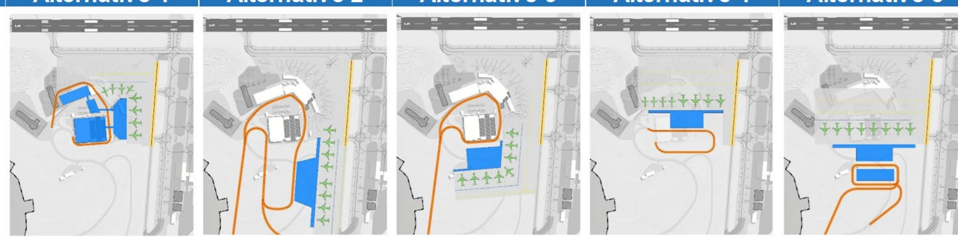
**Figure 15 Site Alternatives**




Source: L&B analysis

Alternative 1 was selected as the preferred location for the new terminal because it can be implemented without significant impacts to the overall site, such as needing fill or relocating access roadways. This alternative can also integrate with the existing terminal and gates to allow for construction phasing with minimal impact to ongoing operations. The other four alternatives each had fatal flaws, either requiring costly fill or roadway location, completing displacing the existing terminal facilities, or not having enough area for aircraft pushbacks.

**Figure 16 Site Evaluation and Selection**

| Evaluation Alternatives / Criteria | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 |
|---|---|---|---|---|---|
| |  | | | | |
| Fill Requirement | Excellent | Average | Average | Good | Poor |
| Use of Existing Structures | Excellent | Average | Good | Poor | Poor |
| Apron / Taxilane Configuration | Average | Poor | Good | Excellent | Excellent |
| Expandability | Excellent | Excellent | Good | Poor | Poor |
| Phasing / Impact to Operations | Good | Excellent | Excellent | Poor | Poor |
| Access Road Impacts | Excellent | Good | Good | Average | Poor |

| | |
|---|---|
| (green) | Excellent |
| (blue) | Good |
| (orange) | Average |
| (red) | Poor |

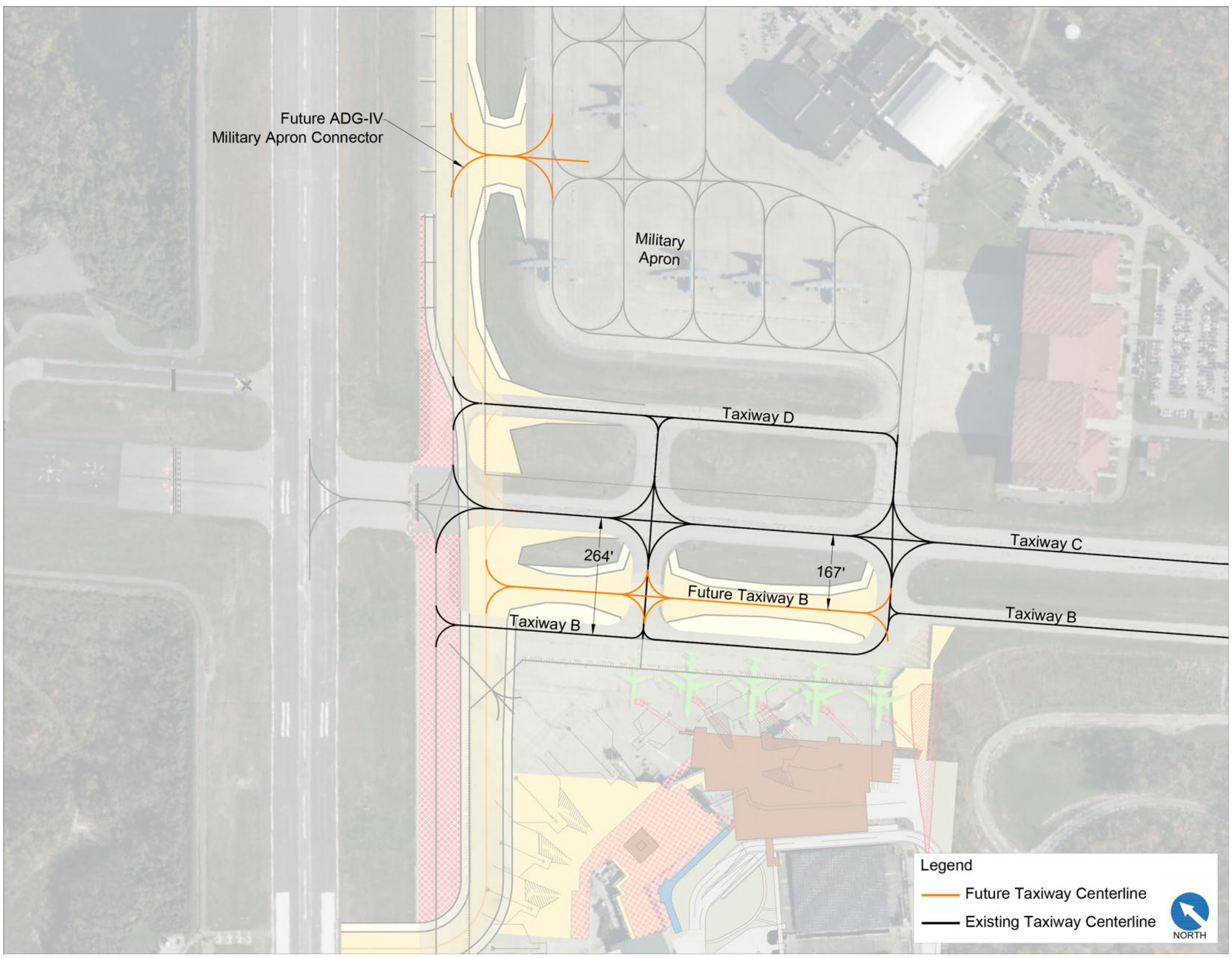
Source: L&B analysis

## 6.3 Terminal Envelope Development

The next step following selection of Alternative 1 was to define the envelope or footprint of the new terminal. As part of this analysis, the location of Taxiway B was identified as an opportunity. Existing ADG III Taxiway B and ADG IV Taxiway C are separated by 264 feet. FAA Advisory Circular (AC) 150/5300-13B requires a minimum separation of 180.5 feet between ADG-III and ADG-IV taxiways and 167 feet between two ADG III taxiways.

The surplus separation between these taxiways presented an opportunity for Taxiway B to be relocated to better serve the future terminal and commercial apron. Because the vast majority of traffic using Taxiways B and C are ADG III aircraft, the decision was made to provide ADG III separation, as shown in **Figure 17**.

**Figure 17 Taxiway Relocation**




Source: L&B analysis

The only ADG IV aircraft operating at CRW are military aircraft which can access their apron via Taxiway A. Therefore, Taxiway B was relocated to provide 167 feet of separation to Taxiway C and Taxiway C was downgraded to an ADG III taxiway. As a result of the Taxiway C downgrade, the existing ADG-IV connection between the military apron and Taxiway C was lost. A replacement ADG-IV connector taxiway was added between the military apron and Taxiway A, east of Taxiway C; this new connector taxiway provides the second ADG-IV connection point between the taxiway system and military apron.

Once the location of Taxiway B was set, the site constraints were evaluated, as shown in Figure 18. This assessment shows how various site constraints defined the available area for a replacement terminal, including the following:

- The new terminal could not impact the existing terminal processor to allow for phasing.
- Part 77 limited the potential locations for aircraft gates due tail penetrations.
- The Object Free Area (OFA) separation to Taxiway B defined the limit line for aircraft parking and apron.
- Minimum distances from the garage defined the edge of the new terminal.
- Steep slope to the south defines the southern edge of the new terminal.

**Figure 18 Terminal Envelope Constraints**


Source: L&B analysis

The terminal envelope analysis defined three footprint sketches, including the Maximum Envelope, Simple Rectangle, and the Hybrid shown in **Figure 19**. The purpose of this exercise was to identify the optimal building shape to accommodate aircraft positions, interior floorplans, and program requirements:

- **Maximum Envelope** utilizes the maximum building extents for a new terminal
- **Simple Rectangle** shows the most simplified approach by building a rectangular building
- **Hybrid** is a mix of the above two to provide the best of both configurations

**Figure 19 Terminal Envelope Development**

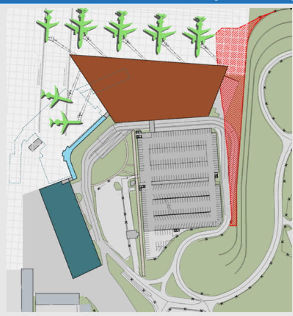
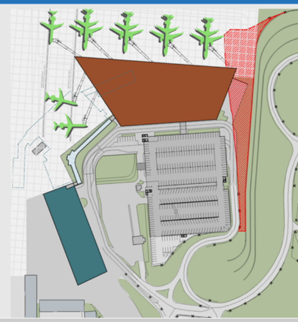
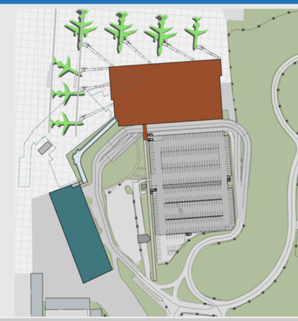
Maximum Envelope Simple Rectangle Hybrid

Source: L&B analysis

The site envelope sketches were refined and assessed using a pros and cons analysis, shown in **Figure 20**. Single and two-level curbside roadways were considered. Alternative A1 was selected as the preferred option for the following reasons:

- Analysis of floorplans showed this option provided the most space and flexibility
- Layout provides the most narrowbody aircraft gate positions
- Two-level curbside roadway ensures no level change for departing passengers

**Figure 20 Refined Terminal Footprints**

| | Preferred Option: Alternative 1A (2 level) | Alternative 1B (1 level) | Alternative 1C (2 level) |
|---|---|---|---|
| |  |  |  |
| **Pros** | • No level change for departing passengers<br>• More narrowbody gate positions | • Lower cost due to single level curb<br>• More narrowbody gate positions | • No level change for departing passengers<br>• Rectangular building will have lower cost<br>• No fill required |
| **Cons** | • Higher cost due to two level curb<br>• Requires fill | • Departing and arriving passengers must change levels<br>• Requires fill | • Higher cost due to two level curb<br>• Fewest narrowbody gate positions |

Source: L&B analysis

## 6.4 Landside Considerations

A landside analysis for the new terminal was conducted. This effort included the development of terminal curbside requirements, a review of traffic flow to and from the new terminal, and an assessment of how the existing curb can remain operational while the new terminal curb is under construction.

**Table 6** shows the modal split assumptions used to develop the new terminal's curb requirements. The modal split defines vehicular traffic, i.e., parking on the curb, utilizing the garage, or going to the rental car center. These assumptions are based on the typical modal split of origin and destination airports.

**Table 6 Mode of Transit Assumptions**

| Mode | Location | Percent |
|---|---|---|
| Dropped-off at Curb | Curb | 26 |
| Rideshare / Taxi | Curb | 14 |
| Shuttle | Curb | 9 |
| Bus | Curb | 3 |
| Parking | Garage | 36 |
| Rental Car | Rental Center | 12 |
| **Total** | - | **100** |

Source: L&B analysis

The curb requirements model utilized 2037 peak hour passenger data with a combined origin and destination peak hour demand of 502 passengers. The model assumed 40 percent of the peak hour passengers are at the curb in the peak 15 minutes. This resulted in a total arrivals and departures curb requirement of 242 feet for the new terminal, shown in **Figure 21**.

**Figure 21 Curbside Requirements Model**

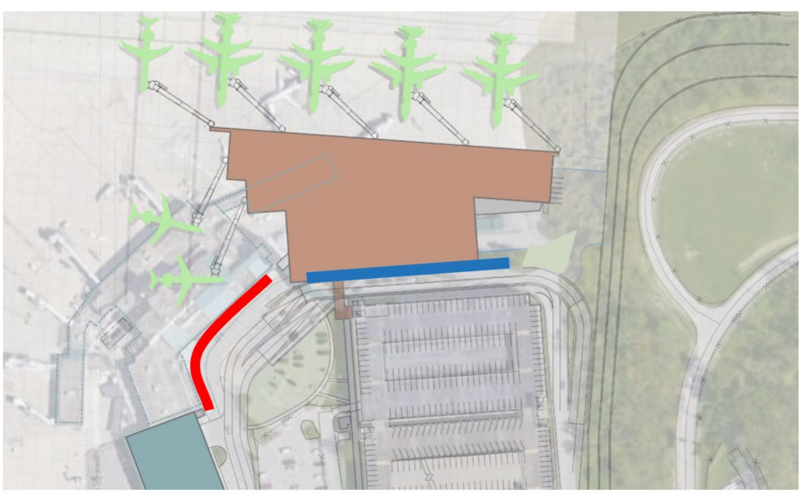
| Vehicle Type | Design Hour Demand in Vehicles | Peak 15 Minutes as % of Demand 40% | Vehicle Dwell Time (min.) | Peak 15 Min. Demand in Minutes | Vehicle Length (ft) | Peak 15 Min. Demand (ft* min.) | Peak 15 Min. Demand (ft) |
|---|---|---|---|---|---|---|---|
| Private Auto | 119 | **48** | 2.0 | **95** | 22 | **2,094** | **140** |
| Rental Car Shuttle | 1 | **0** | 2.0 | **1** | 50 | **40** | **3** |
| Taxis | 60 | **24** | 2.0 | **48** | 22 | **1,056** | **70** |
| Limousines | 1 | **0** | 2.0 | **1** | 50 | **40** | **3** |
| Hotel Shuttles | 1 | **0** | 2.0 | **1** | 50 | **40** | **3** |
| Bus | 3 | **1** | 5.0 | **6** | 60 | **360** | **24** |
| Metro/Train | 0 | **0** | 2.0 | **0** | 30 | **0** | **0** |
| Total | **185** | **74** | | | | Total | **242** |

Source: L&B analysis; ACRP Report 25

The existing curb is 260 feet and exceeds the future requirement. However, the existing curb is not optimal and prone to traffic congestion, even at current demand levels. This is because the curb is a single level, does not have an outer curb, and it is not linear. The curved layout of the existing curb makes it difficult to park and navigate.

**Figure 22** shows a comparison of the existing curb and the proposed new dual level curb. The proposed curb will provide a total of 640 feet on a two-level curb and exceeds the 2037 requirement. However, this configuration will provide future flexibility to support busier peak periods or changes in modal split.

**Figure 22 Curbside Comparison to Existing**



Proposed Curb: 640’ (320’ x 2)

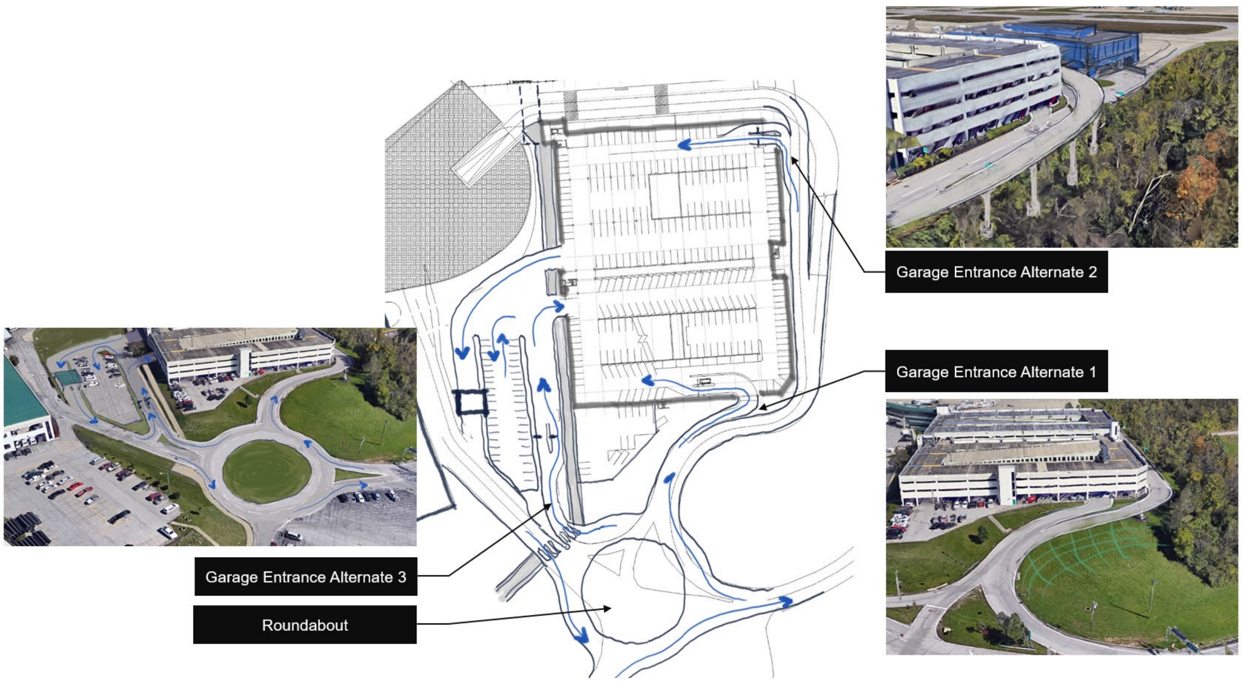
Existing Curb: 260’

- A straight curb provides better utilization, capacity and better decision making than a curved curb.
- The preferred plan exceeds the required curb linear frontage.

Source: L&B analysis

A roundabout and an alternate garage entrance is being proposed, as shown in **Figure 23**. This sketch shows the initial ideas that inspired the final roadway layout shown in the next section. The proposed roundabout will optimize traffic flow and accommodate larger volumes of vehicular traffic. This configuration will also allow for construction phasing by rerouting cars to a temporary curb via the roundabout and bypassing the existing route around the garage.

**Figure 213 Landside Roundabout and Garage Entrance**




Source: L&B analysis

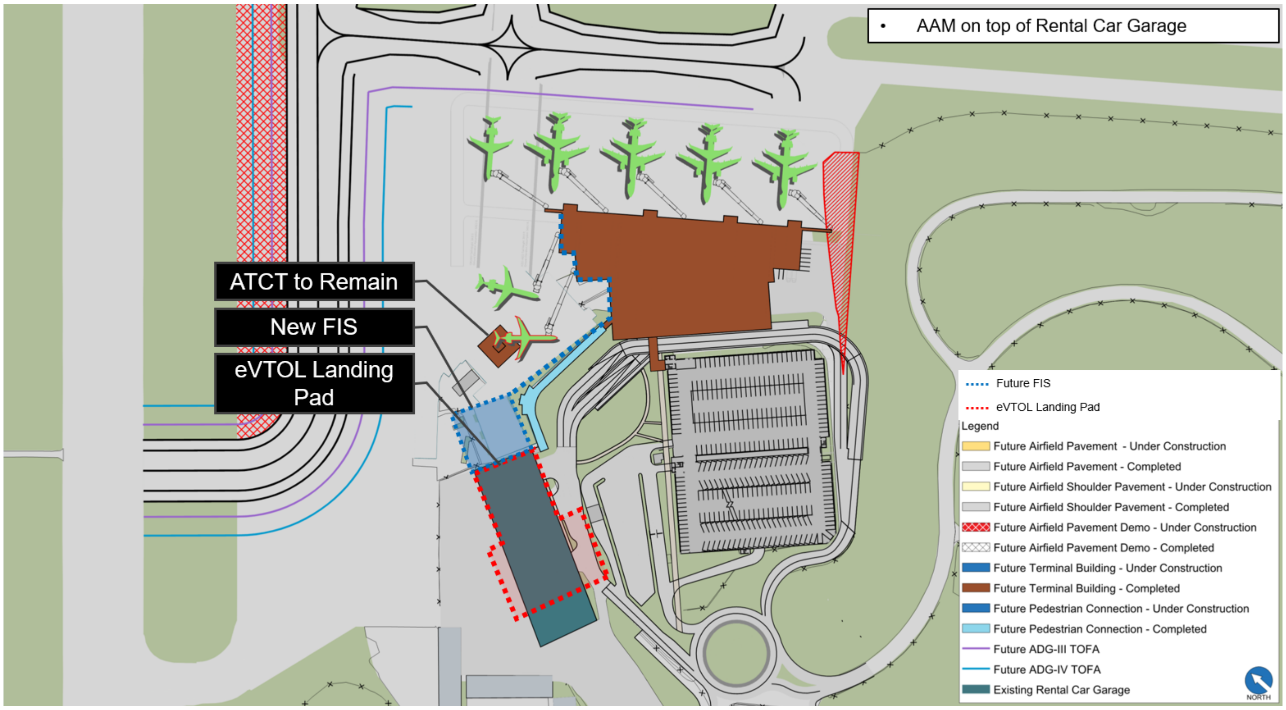
## 6.5 Refined Terminal Configuration

The replacement terminal program, which is based on Alternative 1 in the previous section, is a complete project that relocates all passenger activity from the existing terminal building to a new facility located immediately adjacent to the southeast. Relocating the terminal moves four aircraft gates out of the Part 77 primary surface for CRW's only runway and enables the relocation of a portion of Taxiway A to a standard separation distance of 400 feet from the precision instrument runway. The replacement terminal also resolves the existing building's lack of ADA compliance and lack of TSA space and facility standards compliance.

Upon completion of the project, CRW will demolish all portions of the existing terminal except those portions that support FAA ATCT operations and the Terminal Radar Approach Control (TRACON) facility.

Alternative 1A, shown in the previous section, was further refined to reduce building program and optimize the interior floorplans. **Figure 24** shows the new refined building footprint. The reduced building accommodates all required program areas while reducing cost.

**Figure 224 New Terminal Site Plan**



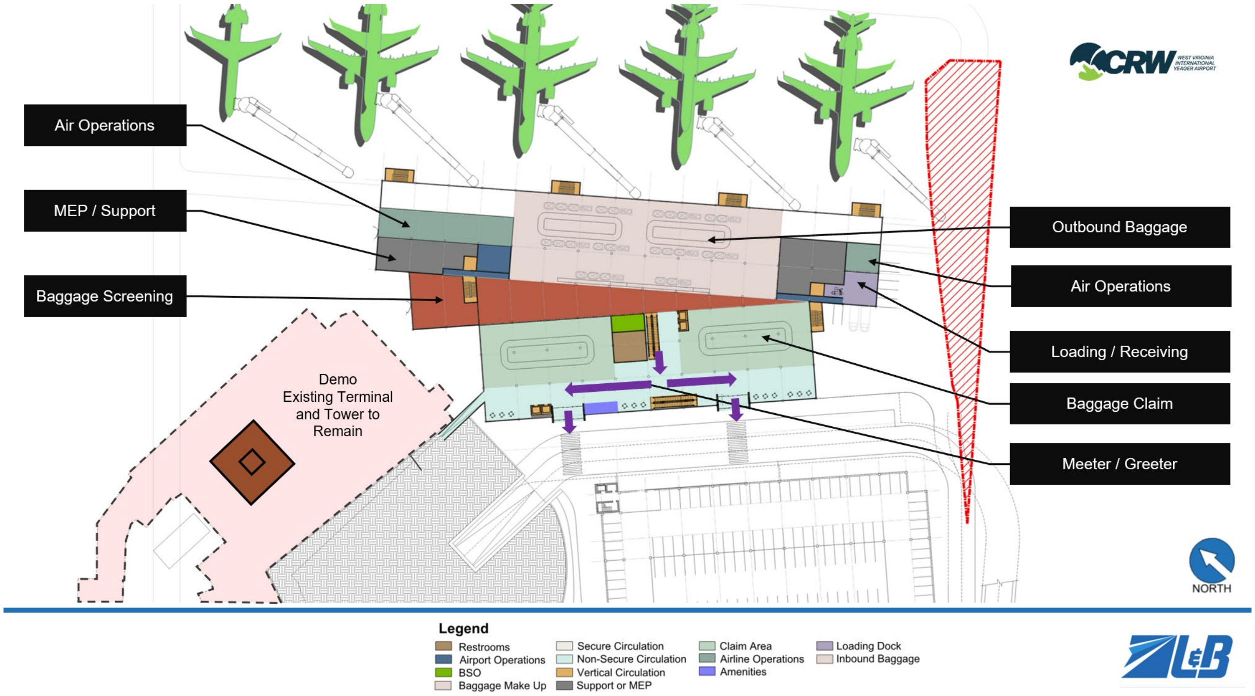

Note: The opening of the seventh gate is an optional component of the program and depends upon the relocation of the ATCT located within the existing terminal building. The relocation of the ATCT is not necessary for the rest of the terminal program. The portion of the existing terminal that supports the ATCT can remain with the replacement terminal using six of its seven gates.

Source: L&B analysis

The terminal program replaces the existing one-level landside/two-level airside building with a facility that has two levels devoted to passenger service. The third level of the new terminal replaces the administrative office and meeting spaces in the third level of the existing building. The third level also includes a bridge that connects the parking garage to the terminal.

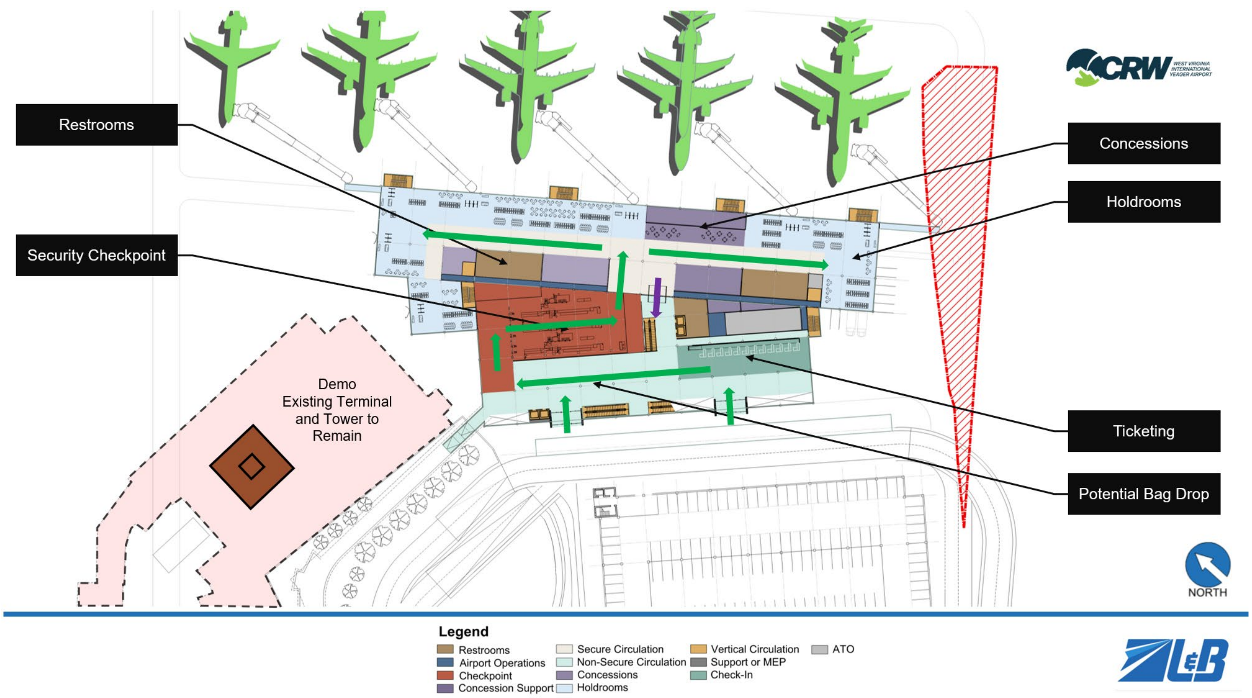
**Figure 25** through **Figure 27** show floorplans of each level of the replacement terminal. The ground level includes the arrivals curb, two baggage claim belts, the TSA baggage screening area, common use airline outbound baggage facilities, and airline operations support rooms. The ground level also includes the loading docks and a truck staging area. The second level includes the departures curb, common or preferential use airline ticket and baggage receiving counters, the TSA passenger screening checkpoint, gate holdrooms, and concessions. The third level includes the bridge to the parking garage, a public corridor, and airport administrative office space.

## Figure 235 Baggage Claim Level



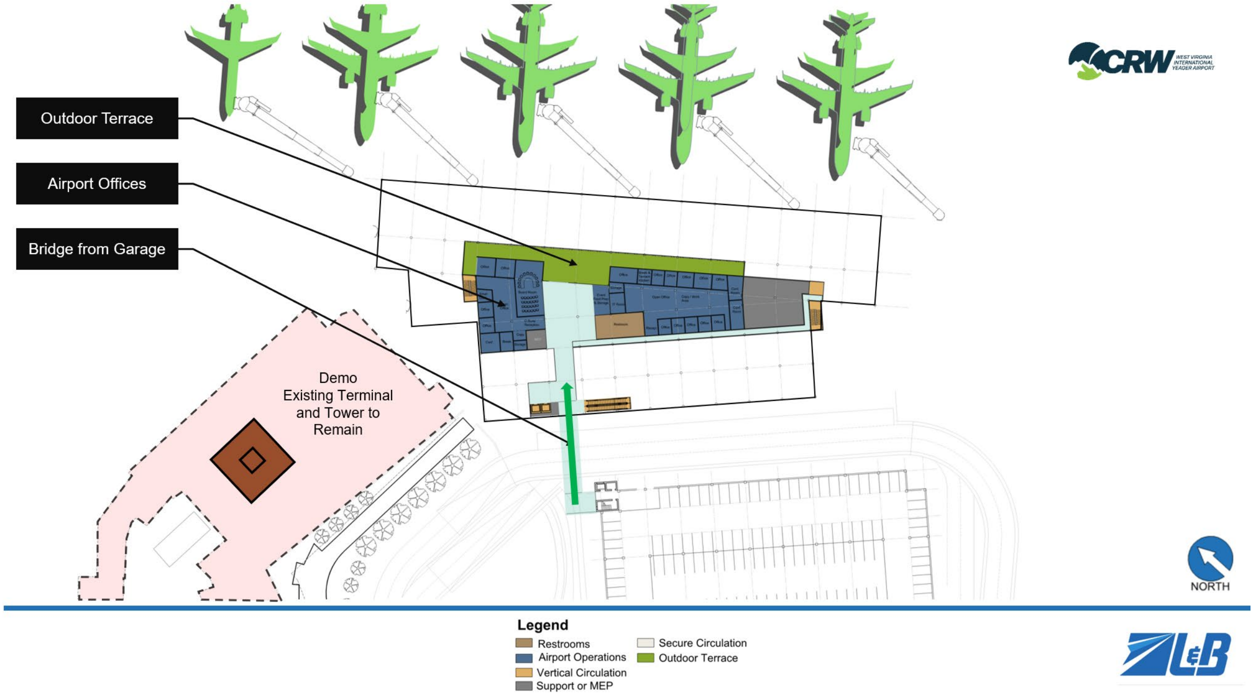

Source: L&B analysis

## Figure 246 Gate Level




Source: L&B analysis

**Figure 257 Upper Level**




Source: L&B analysis

## 6.6 Renderings

The following section includes renderings of the new terminal in the final phasing configuration in **Figure 28** through **Figure 32**. This includes two aerial views, renderings of the holdroom areas, ticketing, and a view from the upper level of the terminal looking down into ticketing. A building cross-section is shown in **Figure 33**.

**Figure 28 Rendering – Aerial View 1**


Source: L&B analysis

**Figure 29 Rendering –Aerial View 2**


Source: L&B analysis

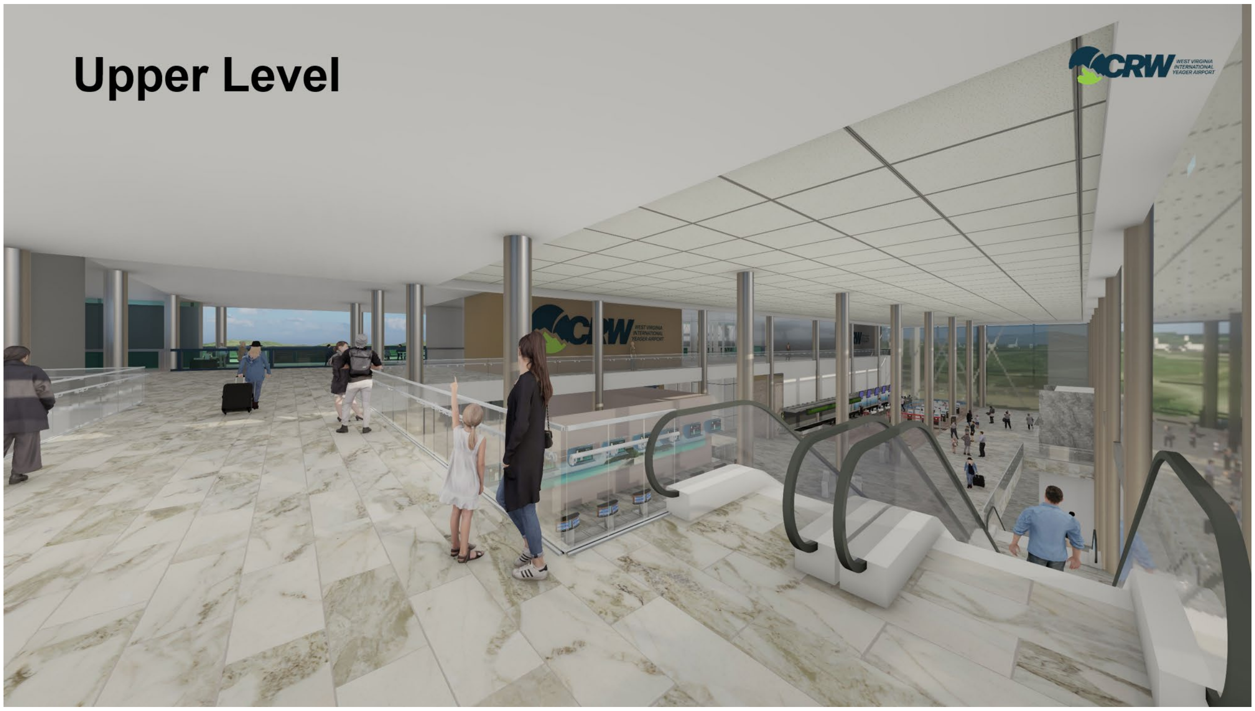
**Figure 30 Rendering – Holdrooms**


Source: L&B analysis

**Figure 31 Rendering – Ticketing**

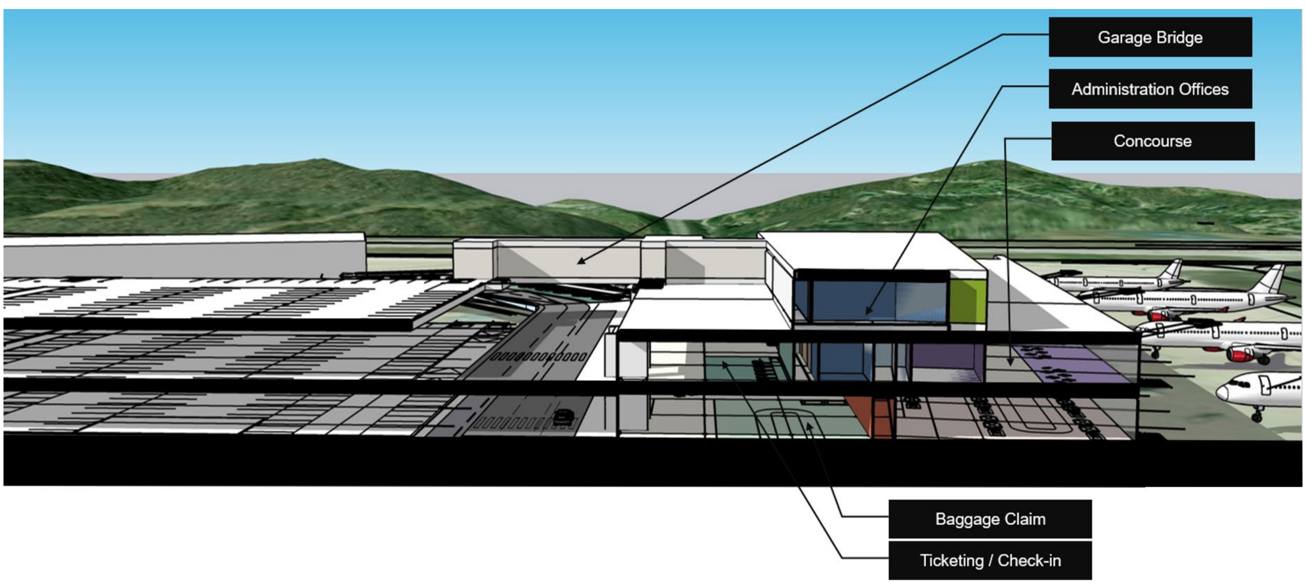

Source: L&B analysis

## Figure 262 Rendering – Upper Level




Source: L&B analysis

## Figure 33 Rendering – Building Section




Source: L&B analysis

# 7 Air Traffic Control Tower Line-of-Sight

The replacement concourse and terminal are in a location that required an evaluation of potential line-of-sight issues from the ATCT. The assumptions used in this analysis include:

- Existing ATCT surveyed cab floor height: 1,006 feet Mean Sea Level (MSL)
- Observer Eye Height: 1,011.5 feet MSL (1,006 + 5.5)
- Used Airports Geographic Information Systems (AGIS) 1A topo survey as basis for ground elevations

The original design parameters for the proposed building are:

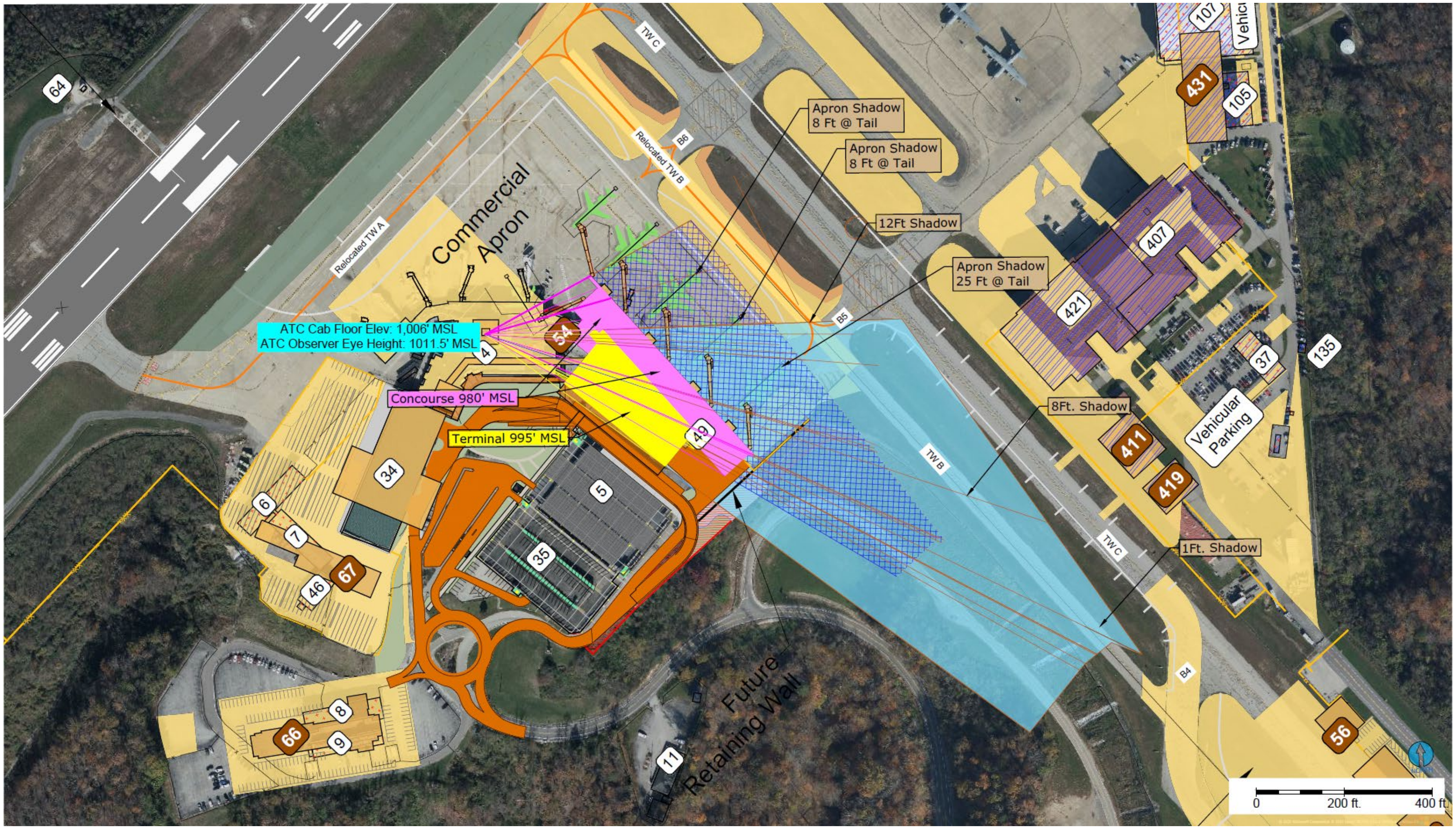
- Terminal: Top elevation of 995 feet MSL
- Concourse: Top elevation of 980 feet MSL

Based on these building heights, the following shadows were identified (see **Figure 34**):

- The lower roofline of the concourse did not create any shadows along the existing or relocated Taxiway B.
- The upper roof line of the terminal building created shadows along existing Taxiway B between B5 and B4. These shadows range in height from 12 feet at the north to 1 foot at the south along Taxiway B.
- The upper roof line of the terminal building created line-of-sight shadows in the apron area of up to 25 feet above ground level (AGL) at the tails of the southern parked aircraft (non-movement area).
- The lower roofline of the terminal building created line-of-sight shadows in the apron area of approximately eight feet AGL at the tails of the northern parked aircraft.

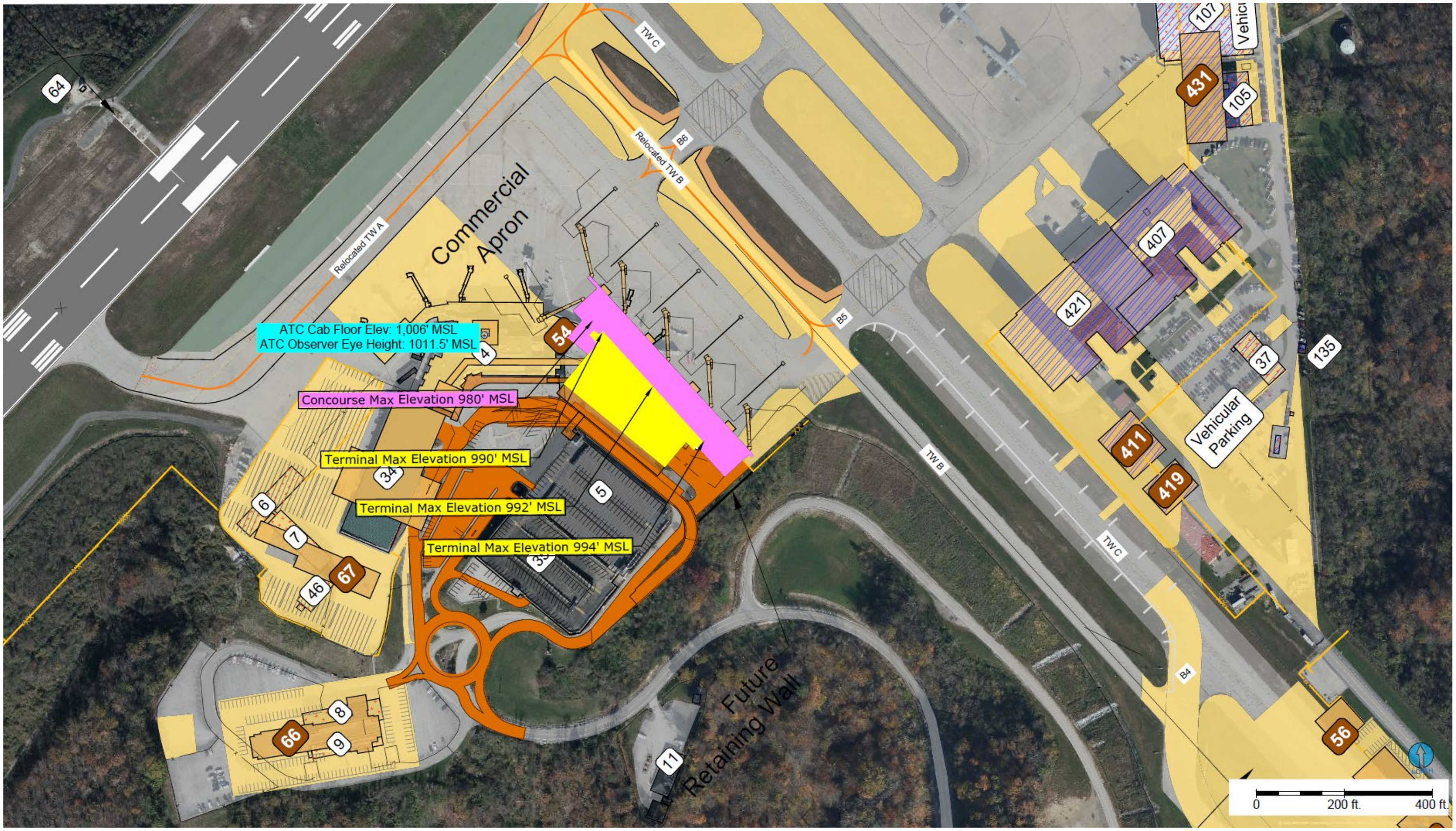
Based on these results, L&B worked backwards from the ground elevation at the intersecting taxiway to the ATCT to determine the maximum elevation of the terminal to avoid casting a shadow on the taxiway. This analysis resulted in the need to lower the roofline closest to the movement area by one to five feet to eliminate shadows along Taxiway B. These maximum building elevations are shown on **Figure 35**.

## Figure 274 Line of Sight Shadow Study –Original Design Parameters




Source: CRW ALP; L&B analysis

### Figure 35 Maximum Allowable Building Elevations



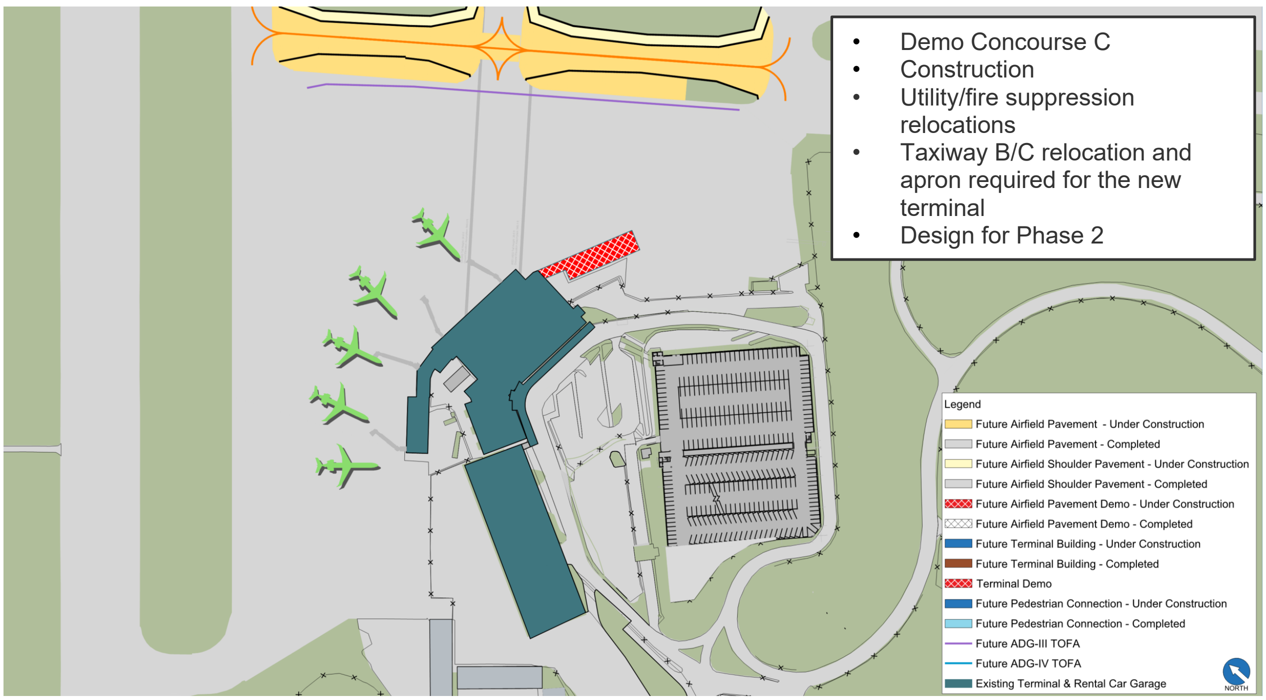

Source: CRW ALP; L&B analysis

# 8 Phasing Plan

## 8.1 Phase 1

**Figure 36** shows the construction and design efforts that will occur with FY 2022 funding. These include relocation of Taxiway B, construction of the aircraft parking apron for the replacement terminal, demolition of Concourse C, and utility relocations. These are enabling projects for replacement terminal construction.

**Figure 36 Phase 1 Projects**

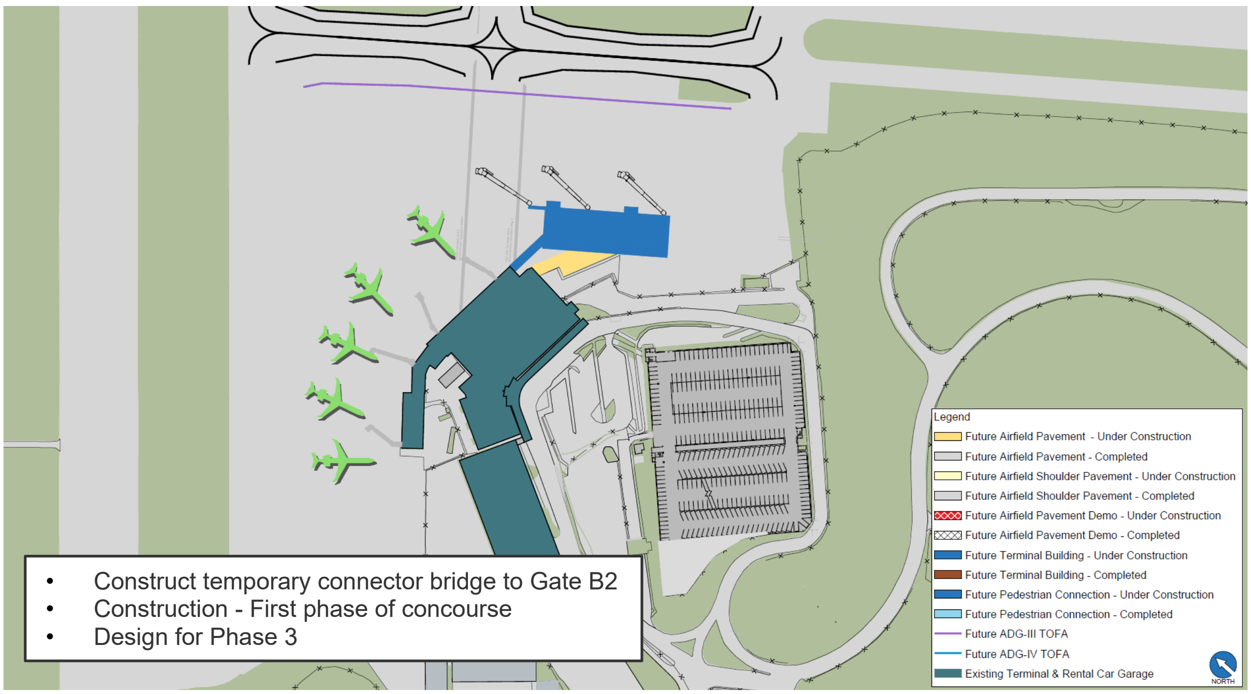



Source: L&B analysis

## 8.2 Phase 2

**Figure 37** shows the Phase 2 construction and design efforts. The major portion of the Phase 2 project consists of approximately 50 percent of the airside holdrooms, gates and concessions, outbound baggage areas, and mechanical systems areas for the replacement terminal. The project also includes a temporary connector to attach the new gate areas to the existing terminal. Phase 2 includes the detailed design for Phase 3. Upon completion of Phase 2, the first three gates of the replacement terminal become operational.

**Figure 37 Phase 2 Projects**

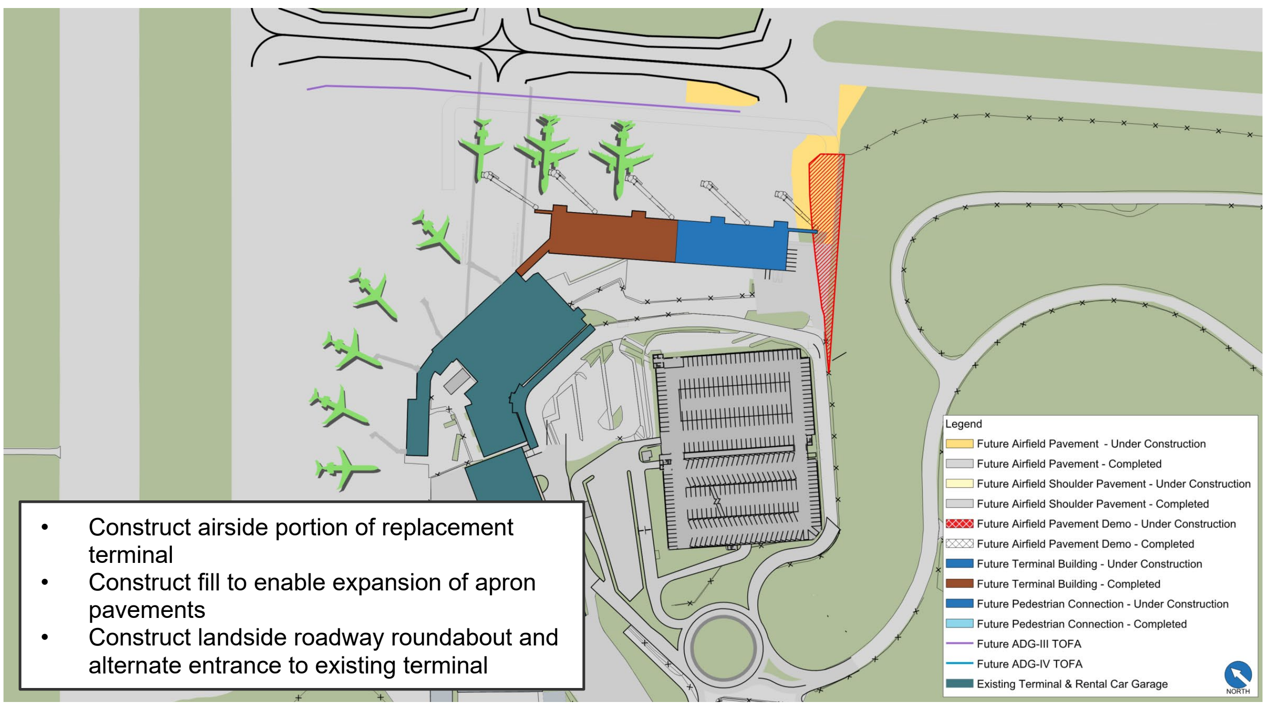



Source: L&B analysis

## 8.3 Phase 3

**Figure 38** shows the Phase 3 construction and design efforts. The major task accomplished under Phase 3 is the completion of the airside portion of the replacement terminal, which includes remaining gates, holdrooms and concessions, outbound baggage areas, and mechanical systems rooms. Phase 3 also contains the fill required to support an expanded aircraft parking apron, loading dock truck staging areas, and the landside roadways serving the replacement terminal curb front. Upon completion of Phase 3, all existing terminal airside holdroom and gate functions will be relocated to the replacement terminal. The cost of this temporary situation to expand the security checkpoint toward gates B1 and B2 is not included in the Phase 3 cost estimate as it was assumed the security checkpoint would remain as is until the final replacement terminal is completed. Phase 3 also includes a new roundabout on the airport entrance road that will support a reoriented entrance and exit from the parking areas and other roads that converge at the existing intersection southwest of the existing parking garage. Phase 3 includes the detailed design for Phase 4. Upon completion of Phase 3, all airside passenger operations will occur from the replacement terminal.

**Figure 288 Phase 3 Projects Figure**

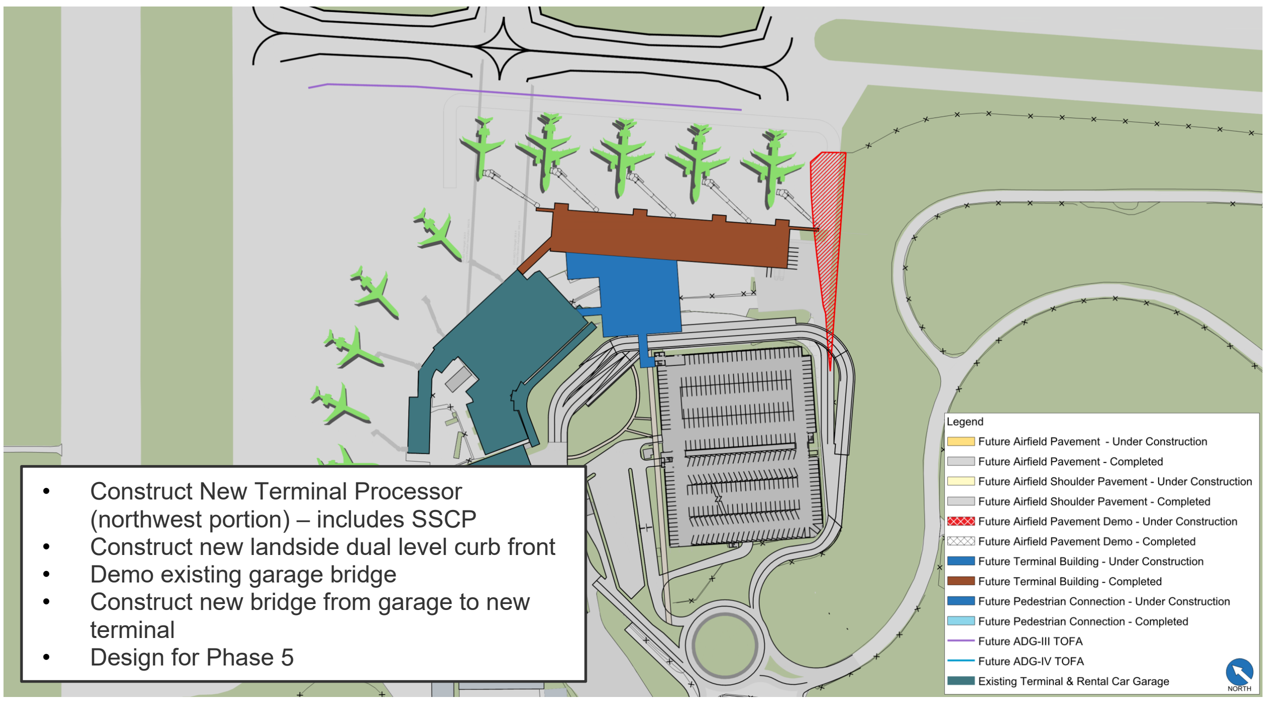



Source: L&B analysis

## 8.4 Phase 4

**Figure 39** shows the Phase 4 construction activities. The major items constructed in Phase 4 include the first half of the replacement terminal's landside including the TSA passenger security checkpoint, the TSA baggage screening area, and half of the baggage claim area. On the landside, the construction includes the bridge to the existing garage, and the dual level roadway system that will serve the replacement terminal. The new bridge to the garage replaces the bridge to the existing terminal. Construction also includes a temporary connector between the existing terminal ticketing hall to the new security checkpoint area. This connector also serves as a route from the garage to the existing ticketing area. Phase 4 also includes the detailed design for Phase 5. Upon completion of Phase 4 construction, the baggage claim and all TSA security functions will relocate to the replacement terminal. The only major function to remain in the existing terminal will be ticketing and baggage check-in.

**Figure 299 Phase 4 Projects**

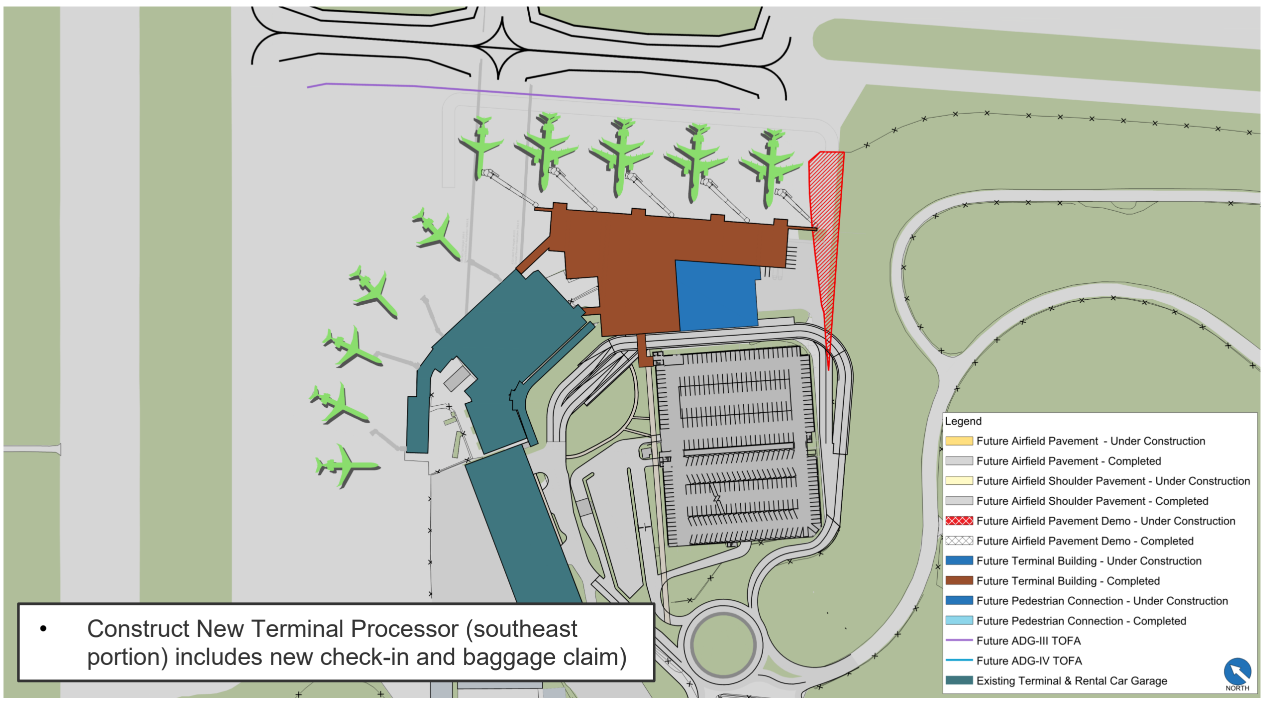



Source: L&B analysis

## 8.5 Phase 5

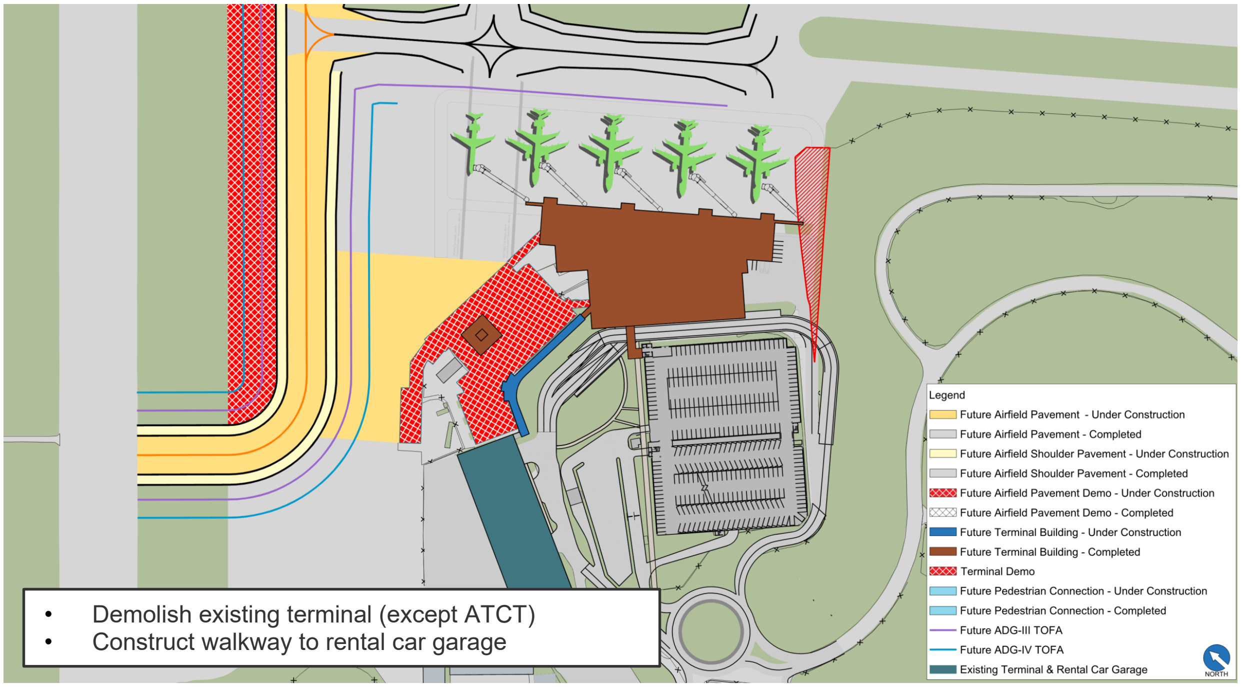
Phase 5 is broken into three sub-phases. **Figure 40** through **Figure 42** shows the construction activities that will occur under Phases 5a, 5b, and 5c. Phase 5 involves the completion of the replacement terminal landside areas and the relocation of Taxiway A to a standard separation from Runway 5-23. It also includes the demolition of the existing terminal building (except the ATCT), construction of a walkway to the rental car garage, and construction of a landing pad for Advanced Air Mobility (AAM). This phase also includes a space reservation for a Federal Inspection Services (FIS) facility and associated sterile corridor if demand for this type of facility is identified in the future.

**Figure 40 Phase 5a**



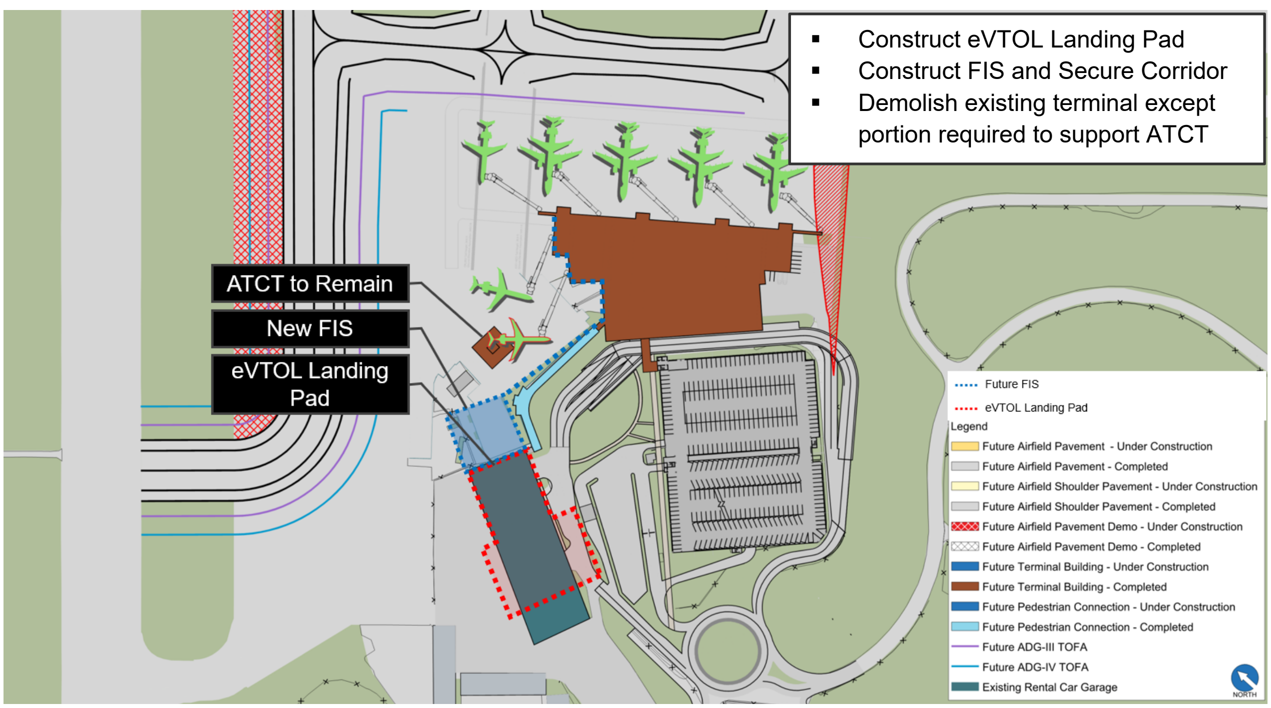

Source: L&B analysis

## Figure 301 Phase 5b




Source: L&B analysis

## Figure 312 Phase 5c




Source: L&B analysis

# 9 Cost Estimation

A planning level cost estimate was developed for the CRW Terminal Program. This program is broken up into five phases, which include both design and construction costs. The total program cost for all five phases is approximately $254 million.

## 9.1 Phase 1

Phase 1 includes the demolition of Concourse C, relocation of Taxiways B and C, and the construction of the apron for the new terminal. For the estimate, the following assumptions were made:

- The taxiway pavement full strength section and apron pavement section were assumed to be 16 inches of Cement Concrete Pavement (CCP), on 4 inches of Hot Mix Asphalt (HMA), on 8 inches of Coarse Aggregate Base Course (CABC). The taxiway pavement shoulder strength section was assumed to be 4 inches of HMA Surface Course, on 6 inches of CABC, on 6 inches of Subbase Course.
- Tenant relocation out of existing Concourse C was set as an allowance of $500,000.
- Airfield lighting costs were assumed to be 30 percent of the total pavement cost. This would include lighting, signage, duct banks, conduit, and airfield lighting control and monitoring system (ALCMS) upgrades. The airfield lighting cost assumption was based on previous bid tabulations for similar scale projects in the region.
- Erosion and sediment control/stormwater management lump sum costs were assumed to be five percent of the total pavement costs. This percentage was based on previous bid tabulations for similar projects.
- Utility fire suppression relocations were assumed to be a lump sum cost of $2,500,000 due to the complexing of the relocation and utility rerouting.
- The miscellaneous utilities lump sum cost was assumed to be $75,000. The lump sum cost includes sanitary, grease, stormwater, electric, water, and gas.

## 9.2 Phase 2

Phase 2 includes the replacement of the old terminal footprint and apron with new apron pavement and the first stage of the new terminal construction. Assumptions included:

- The apron pavement section was assumed to be 16 inches of CCP, on 4 inches of HMA, on 8 inches of CABC.
- Airfield lighting was assumed to be 30 percent of the total pavement costs.
- Erosion and sediment control/stormwater management was assumed to be five percent of the total pavement costs.
- This phase calls for three new Passenger Boarding Bridges (PBB), which were estimated at $600,000 per bridge.
- The miscellaneous utilities lump sum was assumed to be $150,000, which would include sanitary, grease, stormwater, electric, water, and gas.

For the terminal spaces, the unit costs shown in **Table 7** were assumed based on the complexity of each space. The baseline cost of the average terminal space was calculated at $400 per square foot using previous terminal construction bid tabulations. To determine the unit cost of each unique terminal space, this baseline was utilized to assume unit costs based on the quantity and complexity of materials required for construction. The unit costs include a three percent increase to include meeting LEED certification requirements.

**Table 7 Area Cost Assumptions**

| Area | Cost per SF |
|---|---|
| Check-in | $412 |
| Airline Offices | $412 |
| Baggage Make-up/Drop off | $335 |
| CBIS/CBRA Checked Bag Screening | $335 |
| Baggage Claim/BSO | $386 |
| Holdrooms | $412 |
| Airline Operations | $412 |
| Non-Secure Circulation/Lobbies (Includes Bridge(s) to Terminal) | $515 |
| Secured Circulation (Includes Bridge to Existing Terminal) | $515 |
| Restrooms | $824 |
| Security Screening Checkpoint | $1,236 |
| TSA Offices | $412 |
| Concessions | $515 |
| Airport Operations/Administration | $412 |
| Tenant Spaces/Amenities | $412 |
| Vertical Circulation | $1,030 |
| MEP/Support | $1,236 |
| Loading Dock | $258 |
| Terrace | $361 |

Note: These values were carried through Phases 3-5 with terminal construction.
Source: ADCI Corp

## 9.3 Phase 3

Phase 3 includes additional apron pavement for the concourse extension, the second stage of the new terminal construction, and landside roadway improvements. Assumptions included:

- The apron pavement section was assumed to be 16 inches of CCP, on 4 inches of HMA, on 8 inches of CABC.

- Airfield lighting was assumed to be 30 percent of the total pavement costs.
- Erosion and sediment control/stormwater management was assumed to be five percent of the total pavement costs.
- The terminal spaces utilized the unit costs outlined for Phase 2.
- Miscellaneous utilities lump sum was assumed to be $150,000, which would include sanitary, grease, stormwater, electric, water, and gas.

This phase also incorporated the pavement associated with the loading dock (airside), and the new roundabout and garage exit construction. Signage/wayfinding was also included due to the rerouting of traffic landside.

## 9.4 Phase 4

Phase 4 includes the third stage of the new terminal construction, the construction of the new landside dual level curb front, and earthwork required to expand the airfield to accommodate the new terminal.

The quantity of earthwork was obtained by calculating the area needed to bring the existing ground to match the apron elevation and assuming a depth of 80 feet across the area. This was split into landside and airside fill. The unit costs were assumed to be $40 per cubic yard due to the steep terrain and the need for Class II Rip Rap to stabilize the steep slope. Erosion and sediment control/stormwater management was assumed to be five percent of the total earthwork costs.

The dual level curb front cost included portions of the roadway and a miscellaneous landside bridge allowance. The miscellaneous landside bridge allowance was estimated to be approximately $2,000,000, which assumed 20 footings at a unit cost of $100,000/footing. The new curb front will require 25 high mast light poles for new roadway lighting, assuming $40,000 per light pole.

The miscellaneous utilities lump sum was assumed to be $150,000, which would include sanitary, grease, stormwater, electric, water, and gas.

## 9.5 Phase 5

Phase 5 includes the replacement of the old terminal footprint and apron with new apron pavement, construction of new Taxiway A, the final stage of the new terminal construction, and an electric vertical takeoff and landing(eVTOL) pad. Assumptions included:

- The taxiway pavement full strength section and apron pavement section were assumed to be 16 inches of CCP, on 4 inches of HMA, on 8 inches of CABC. The taxiway pavement shoulder strength section was assumed to be 4 inches of Asphalt Surface Course, on 6 inches of CABC, on 6inches of Subbase Course.
- Airfield lighting was assumed to be 30 percent of the total pavement costs.
- Erosion and sediment control/stormwater management was assumed to be five percent of the total pavement costs.
- This phase calls for two new PBBs, which were estimated at $600,000 per bridge.

- This phase includes the demolition of the existing building and temporary airside and landside connectors to the existing terminal building. This work was priced as selective demolition ($50 per square foot) due to certain aspects of the structure which needed to remain.
- The Baggage handling system was not included in the unit cost of the baggage room. The baggage handling system that was estimated assumed 80 drives at $75,000 per drive, 800 linear feet of outbound bag belts/claim carousels at $400 per linear foot, and 2 electronic data systems (EDS) at $1,200,000 per unit.
- FIS and sterile corridor were priced at the standard unit cost of terminal spaces ($400 per square foot).
- The miscellaneous utilities lump sum was assumed to be $150,000, which would include sanitary, grease, stormwater, electric, water, and gas.

The final aspect of this phase includes the installation of an eVTOL landing pad on top of the existing rental car garage, and installation of solar panels on the new terminal. The eVTOL landing pad was assumed at a lump sum cost of $2,000,000, and the solar panels were assumed to cost $10 per square foot plus a $15,000 lump sum cost to obtain a LEED certification.

# 10 Funding Source Analysis Overview

The proposed passenger terminal building program is estimated to cost approximately $254 million including design, construction, contingencies, and other soft costs. Based on the estimated terminal development costs, a funding source analysis was completed. In developing the financial plan, the overriding objective was to identify maximum funding eligibility from each potential funding source to maximize the use of external resources and minimize the amount of funding from CRW and local public resources. This section presents a summary overview of the funding source analysis; a more detailed overview is provided in **Appendix A**.

The costs for the new passenger terminal building could be funded from a combination of sources, including:

- FAA Grants
  - Airport Improvement Program (AIP) Entitlements
  - AIP Discretionary Grants
  - Supplemental Grants
  - Small Airport Fund
- Federal Relief Funds
  - Coronavirus Aid, Relief, and Economic Security (CARES) Act Grants
  - Coronavirus Response and Relief Supplemental Appropriation (CRRSAA) Act Grants
  - American Rescue Plan Act (ARPA) Grants
- Federal Bilateral Infrastructure Law (BIL) Funds
  - Airport Infrastructure Grants (AIG)
  - Airport Terminal Program (ATP) Grants
  - FAA Facilities & Equipment (F&E) Grants
- Congressional Earmarks

- Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Discretionary Grant Program
- U.S. Economic Development Administration (EDA) Grants
  - State of West Virginia Funds
- Passenger Facility Charges (PFCs)
- Airport Funds (including airport cash and bond funds)

Based on every potential funding source's eligibility and grant matching thresholds, an eligibility analysis was performed focused on those project elements that are part of the terminal development program. Generally, PFC eligibility guidelines provide the maximum funding eligibility levels for each project. As such, PFC eligibility guidelines were used to determine the maximum eligibility for each terminal development project element.

Depending on the funding source, however, the actual funding level could be less than the maximum eligibility level calculated using the PFC guidelines. For example, for terminal buildings, PFC eligibility is based on the type of space within the terminal. If the maximum PFC eligible amount for the terminal building was determined to be 85 percent and the funding source were to be the BIL ATP fund (which has a maximum FAA matching share of 95 percent of the eligible terminal space), the resulting eligible amount would be 80.75 percent, or 95 percent of 85 percent. For an airfield project, however, which is eligible for PFCs up to 100 percent that is to be funded with FAA entitlement funds, the total eligible amount would be 90 percent, or 90 percent of 100 percent.

**Table 8** presents a summary of the terminal development program's eligibility analysis conducted for Phases 1 through 5. Based on the eligibility analysis, it was estimated that a maximum amount of approximately $222.5 million of the $254 million terminal program, or 87.6 percent, could be eligible using PFC guidelines. The remaining $31.4 million constitutes the lowest amount that would be ineligible for funding. Depending on the actual funding source used to fund each project element, the share of costs funded with matching funds could potentially be lower than $222.5 million, or 87.6 percent, thereby increasing the amount of ineligible costs.

**Table 8 Terminal Program Eligibility ($ Millions)**

| Project Element | Cost | Max Eligible % | Max Eligible Amount | Ineligible Amount |
|---|---|---|---|---|
| Design | $21.0 | 88.0 | $18.5 | $2.5 |
| Terminal Building | 109.3 | 84.7 | 92.5 | 16.8 |
| Loading Bridges | 4.2 | 100.0 | 4.2 | 0.0 |
| Airfield & Apron | 12.3 | 100.0 | 12.3 | 0.0 |
| Enabling Projects | 8.7 | 88.2 | 7.7 | 1.0 |
| Roadway | 7.3 | 100.0 | 7.3 | 0.0 |
| Utilities | 3.3 | 84.1 | 2.8 | 0.5 |
| Miscellaneous | 87.8 | 88.0 | 77.3 | 10.5 |
| **Total** | **$253.9** | **87.6%** | **$222.5** | **$31.4** |

Source: L&B and ADCI Corp analysis

**Table 9** and **Table 10** summarize eligibility levels and funding available to CRW by funding source. Other potential funding sources not identified previously are also shown in the tables. These tables present specific project elements that are eligible for funding by each funding source. For example, FAA AIP Entitlement grants are eligible for up to 90 percent for federal funding and would most likely be used toward airfield, apron, and their associated design costs. In addition, CRW is estimated to receive approximately $10 million in FAA AIP Entitlement grants over the next five years that could be applied toward airfield, apron, and their associated design costs.

## Table 9 Terminal Program Eligibility by Funding Source ($ Millions)

| | | | FEDERAL GRANT FUNDS | | | | | FEDERAL BIL FUNDS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AIP Entitlement Grants | AIP Discretionary Grants | Supplemental Grants | Earmarks | Small Airport Fund | Airport Infrastructure Grants | Airport Terminal Program | FAA Facilities & Equipment |
| Matching Share (%) | [A] | | 90% | 90% | 90% | Unknown | 90% | 100.0% | 95.0% | 100% |
| Project Eligibility (%) | [B] | | 100% | 100% | 100% | Unknown | 100% | 87.6% | 87.6% | 100% |
| **Max Funding Share (%)** | **[C=AxB]** | | **90%** | **90%** | **90%** | **Unknown** | **90%** | **87.6%** | **83.3%** | **100%** |
| **Max Funding Available to CRW (2022 - 2026)** | | | **$10.0** | **$20.0** | **Unknown** | **Unknown** | **Unknown** | **$10.5** | **$211.4** | **Unknown** |
| **Project Element** | **Total Cost** | **Max Eligible Amount** | **Eligible Projects by Funding Source** | | | | | | | |
| Design | $21.0 | $18.5 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Terminal Building | 109.3 | 92.5 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Loading Bridges | 4.2 | 4.2 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Airfield & Apron | 12.3 | 12.3 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Enabling Projects | 8.7 | 7.7 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Roadway | 7.3 | 7.3 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Utilities | 3.3 | 2.8 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Miscellaneous | 87.8 | 77.3 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| **Total** | **$253.9** | **$222.5** | | | | | | | | |

Note: Amounts may not add to total due to rounding.
Checkmarks show most likely eligibility for each project based on funding source. Other projects may be eligible for certain funding sources; however, they would be considered a lower priority for funding.

Source: L&B and ADCI Corp analysis

**Table 10 Terminal Program Eligibility by Funding Source ($ Millions) (Continued)**

| | | | FEDERAL RELIEF FUNDS | | | OTHER FUNDS | | | | | LOCAL FUNDS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CARES Act Funds | CRRSA Act Funds | ARP Act Funds | RAISE Grant Program | U.S. EDA Grants | WVDOT Grants | State of WV Discretionary | City of Charleston Discretionary | PFCs | Airport Cash | Airport Bonds |
| Matching Share (%) | [A] | | 100% | 100% | 100% | 80% | 90% | 5% | Unknown | Unknown | 100.0% | 100% | 100% |
| Project Eligibility (%) | [B] | | 100% | 100% | 100% | 100% | 100% | 100% | Unknown | Unknown | 0.0% | 100% | 100% |
| **Max Funding Share (%)** | **[C=AxB]** | | **100%** | **100%** | **100%** | **80%** | **90%** | **5%** | **Unknown** | **Unknown** | **0.0%** | **100%** | **100%** |
| **Max Funding Available to CRW (2022 - 2026)** | | | **$2.9** | **$0.0** | **$3.1** | **Unknown** | **Unknown** | **Unknown** | **Unknown** | **Unknown** | **$0.0** | **$0.0** | **To Be Determined** |
| **Project Element** | **Total Cost** | **Max Eligible Amount** | **Eligible Projects by Funding Source** | | | | | | | | | | |
| Design | $21.0 | $18.5 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Terminal Building | 109.3 | 92.5 | | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Loading Bridges | 4.2 | 4.2 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Airfield & Apron | 12.3 | 12.3 | ✔ | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Enabling Projects | 8.7 | 7.7 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Roadway | 7.3 | 7.3 | | | | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Utilities | 3.3 | 2.8 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Miscellaneous | 87.8 | 77.3 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| **Total** | **$253.9** | **$222.5** | | | | | | | | | | | |

Note: Amounts may not add to total due to rounding.
Checkmarks show most likely eligibility for each project based on funding source. Other projects may be eligible for certain funding sources; however, they would be considered a lower priority for funding.

Source: L&B and ADCI Corp analysis

# Appendix A – Funding Source Analysis

As presented in the previous sections, the CRW proposed passenger terminal building program is estimated to cost approximately $254 million to construct, including design, construction, contingencies, and other soft costs. Based on the estimated terminal development costs, a funding source analysis was developed for CRW. The overriding objective was to identify maximum funding eligibility from each potential funding source to maximize the use of external resources and minimize the amount of funding from airport and local public resources. It was assumed that the costs for the new passenger terminal building will be funded from a combination of sources, which could include:

- FAA Grants
  - AIP Entitlements
  - AIP Discretionary Grants
  - Supplemental Grants
  - Small Airport Fund
- Federal Relief Funds
  - CARES Act Grants
  - CRRSAA Act Grants
  - ARPA Grants
- Federal BIL Funds
  - AIG
  - ATP Grants
  - FAA F&E Grants
- Congressional Earmarks
- RAISE Discretionary Grant Program
- U.S. EDA Grants
- State of West Virginia Funds
- PFCs
- Airport Funds (including Airport cash and bond funds)

To implement a project of this magnitude and make it financially affordable to the airport and the airlines, the Central West Virginia Regional Airport Authority (the Authority) will need to fully maximize its sources of federal, state, and local funds to keep the airport costs competitive. As such, the following sections provides a brief overview of potential federal, state, and local grant programs, and their funding eligibility relative to each potential funding source.

## A.1 FAA Grants

Funding from the FAA is based on the AIP as reauthorized under the FAA Reauthorization Act of 2018 that was signed into law on October 5, 2018. It extended the FAA's funding and authorities through Fiscal Year 2023. As part of the AIP, federal grants are provided in the form of entitlement grants (based on annual enplaned passenger levels), discretionary grants, and letter-of-intent (LOI) grants. FAA AIP funds are distributed each year based on Congressional.

### A.1.1 Passenger Entitlement Funds

The current legislation provides eligible Primary airports such as CRW with entitlement funds which are calculated based on an airport's number of enplaned passengers each year. As such, the Authority typically receives approximately $2.0 million in passenger entitlement funds from the FAA each year.

The eligibility of funds from the FAA to the nation's airports is based upon several eligibility criteria and tied to a priority system used to rank each request and determine which projects will be funded and which will not during any given fiscal year. The FAA's priority system has different criteria for different projects. For instance, planning projects are assessed using specific criteria applicable to planning types of projects. Generally, projects that enhance the safety of aircraft operations and those that enhance system capacity are higher priority projects. The priority system also ranks projects based on airport size number of aircraft and aircraft operations at the facility.

Guidance on eligibility issues is provided in FAA Order 5100.38A, Airport Improvement Program Handbook. The Federal funding share for these projects is generally 90 percent for small commercial service airports such as CRW. In general, only those projects related to non-revenue producing items, such as land acquisition, airfield construction, certain public areas of the terminal area building, and safety/security projects are eligible for FAA AIP funding. Under most circumstances, projects which qualify for FAA AIP funding are eligible for up to 90 percent of total project costs. Close agency coordination is often required to address more complex issues relative to project eligibility.

### A.1.2 Discretionary Funds

The FAA distributes the remaining AIP funds to a discretionary fund. Discretionary and LOI grants are distributed by each FAA region based on availability and project priorities. Discretionary grants are generally made available to fund project costs on an annual basis, while LOI grants are used to fund capacity enhancement projects and are distributed to an airport over several years at defined annual funding levels. The funds that remain after funding of entitlements, noise and environmental, and the Military Airports Program (MAP) are true discretionary funds the FAA distributes based on a national prioritization system, with highest priority given to safety, security, reconstruction, capacity, and standards. Each project is given a priority ranking based on these program objectives. The ranking priority and calculation is defined in FAA Order 5100.39 (Airport Capital Improvement Plan).

Eligibility for FAA Discretionary Funds is the same as those discussed previously for AIP Entitlement Grants (up to 90 percent).

### A.1.3 Supplemental Grants

On December 27, 2020, the President signed Public Law 116-260, *Consolidated Appropriations Act, 2021*, which included $400 million for Supplemental Discretionary grants under the AIP statute, 49 U.S.C. Chapters 471 and 475. These Supplemental Discretionary funds are derived from the General Fund and are not subject to existing AIP discretionary formulas or set-asides and are available for award through FY 2023. The FAA uses the Airport Capital Improvement Plan (ACIP) process to develop a proposed list of eligible and justified projects, which is executed through its regular AIP process. In general, these grants are used to help strengthen our country's airports and the communities they serve by making investments that create jobs and increase safety, sustainability, and accessibility.

The FAA announced FY 2021 Supplemental Discretionary awards on September 30, 2021. The FAA awarded more than $479 million in airport infrastructure grants to 123 projects at airports across all 50 states, American Samoa, and Puerto Rico. All grants authorized under the current authorization will be executed by September 30, 2023.

Eligibility for FAA Supplemental Grants is the same as those discussed previously for AIP Entitlement Grants (up to 90 percent).

### A.1.4 Small Airport Fund

As part of the FAA Reauthorization Act of 2018, the FAA specifically prioritized that funds from the Small Airport Fund could be used for “Airport Development for Eligible Mountaintop Airports,” per Section 47116 of U.S. Code Title 49 (49 USC § 47116). As part of the revised code for the Small Airports Fund, the FAA shall give priority consideration to mass grading and associated structural support (including access road, duct banks, and other related infrastructure) at mountaintop airports, provided the airport would not otherwise have sufficient surface area for eligible and justified airport development projects – such as CRW’s terminal project, the runway safety area (RSA) project; or additional hangar space.

Eligibility for FAA Small Airport funding is the same as those discussed previously for AIP Entitlement Grants (up to 90 percent).

## A.2 Federal Relief Funds

As a result of the impacts of the COVID-19 pandemic in 2020 and 2021, Congress passed several federal assistance bills to assist severely distressed sectors, including airports. Each of these federal relief programs are described briefly below.

### A.2.1 CARES Act

The Coronavirus Aid, Relief, and Economic Security (CARES) Act (H.R. 748, Public Law 116-136) was approved by the U.S. Congress and signed by the President on March 27, 2020. It is one of the legislative actions taken to address the crisis associated with the COVID-19 pandemic and includes among its relief measures direct aid in the form of grants for U.S. airports, as well as direct aid, loans and loan guarantees for passenger and cargo airlines. The CARES Act provides $10 billion of grant assistance to airports.

The FAA announced in April 2020 that it had allocated approximately $4.8 million to the Authority for the airport. The Authority used approximately $1.9 million of CARES Act funds in FY 2020 and FY 2021 for the reimbursement of Operating Expenses. The Authority still has approximately $2.9 million that could be used for approved uses, including the reimbursement of operating expenses or toward eligible project costs.

In general, eligible project costs under the CARES Act, include the same as those used to determine eligibility for AIP grants, with the exception that any eligible costs are eligible up to 100 percent.

### A.2.2 Coronavirus Response and Relief Supplemental Appropriation Act

On December 27, 2020, the Consolidated Appropriations Act, 2021 was signed by the President. Division M of that Act is the Coronavirus Response and Relief Supplemental Appropriation Act, 2021 (CRRSAA). Title IV of CRRSAA provides approximately $2 billion in economic relief to airports to prevent, prepare for, and respond to the COVID-19 public health emergency, including relief from rent and minimum annual guarantees (MAGs) for eligible airport concessions at primary airports.

The FAA announced on February 12, 2021, that it had allocated approximately $2.1 million to the Authority. Of that amount, approximately $48,582 must be used for concessionaire relief. The Authority plans to apply all of this funding, except for the amounts obligated to concession relief, for the reimbursement of its operating expenses in FY 2021 and FY 2022.

Eligible project costs under the CRRSAA, include the same as those used to determine eligibility for AIP grants, with the exception that any development-related costs must be associated with combating the spread of pathogens at the airport (such as the airport's planned terminal building), and up to 100 percent of those costs are eligible for ARP funding.

### A.2.3 American Rescue Plan Act

On March 11, 2021, the President signed the American Rescue Plan Act of 2021 (ARPA), a $1.9 trillion economic stimulus package designed to help the United States' economy recover from the adverse impacts of the COVID-19 pandemic. In addition to other economic relief, ARPA includes financial relief for certain eligible airports. For eligible airports, ARPA appropriates $8 billion to assist such airports to prevent, prepare for, and respond to COVID-19, and such amounts remain available until September 30, 2024.

The FAA announced in June 2021 that it had allocated approximately $3.3 million to the Authority for the airport. Of that amount, approximately $194,328 must be used for concessionaire relief. The Authority plans to apply all of this funding, except for the amounts obligated to concession relief, for the reimbursement of its operating expenses or toward eligible project costs.

Eligible project costs under the ARPA Act, include the same as those used to determine eligibility for AIP grants, with the exception that any development-related costs must be associated with combating the spread of pathogens at the airport (such as the airport's planned terminal building), and up to 100 percent of those costs are eligible for ARPA funding.

## A.3 Bilateral Infrastructure Law Funds

On November 15, 2021, the President signed the Bipartisan Infrastructure Law (BIL), also known as the Infrastructure Investment and Jobs Act, a $550 billion infrastructure and economic stimulus package designed to provide public investment in US transportation networks, broadband, and public works projects. In addition to other infrastructure funding, the BIL includes infrastructure funding of $15 billion for airports over the next five years (2022 – 2026). Funding from the BIL for airports is broken down into three major programs: the F&E Program, the AIG Program, and the ATP, each of which are summarized below.

### A.3.1 Facilities and Equipment Program

The F&E Program provides funding for FAA-owned ATCTs including FAA-owned contract towers. The focus on lower tier ATCTs and specific facilities portfolio backlog items will help to improve safety, security, and environmental standards at facilities that infrequently receive the limited amount of yearly appropriated F&E Program dollars. F&E Program funding are to be used for replacing FAA-owned terminal and route ATC facilities, improvement of air route and terminal facilities; workplace safety and environmental standards compliance; FAA-owned fuel storage tank replacement and management; unstaffed infrastructure sustainment; real property disposition; electrical power system sustain and support; energy maintenance and compliance; hazardous materials management and environmental clean-up; facility security risk management; mobile asset management program; and administrative expenses, including salaries and expenses, administration, and oversight.

As part of the F&E Program, a total of $5 billion will we awarded to FAA-owned ATCTs in the amount of $1 billion each year for the next five years. Eligible projects include:

- Capital improvements for FAA-owned and maintained facilities
- Terminal and En Route staffed facilities that directly manage ATC operations
- Sustainment activities at FAA-owned unstaffed facilities and supporting infrastructure such as power systems, fuel storage tanks, facilities security risk management, environmental activities at FAA-owned facilities, sustainment of Long-Range Radar facilities, and sustainment of mobile ATC facilities.
- Replacement of FAA-owned Terminal and En Route facilities are eligible.

### A.3.2 Airport Infrastructure Grant Program

The AIG Program provides grants to thousands of airports across the country to invest in a variety of maintenance and improvement projects (e.g., runways and taxiways, noise, multimodal, and terminal buildings). In total, AIG Grants of $15 billion will be awarded to airports in the amount of $3 billion each year for the next five years. AIG Program funds that remain unobligated at the end of the fifth year are available for a competitive discretionary grant program. In general, eligibility for AIG funds is based on PFC eligibility guidelines contained in the PFC Handbook (FAA Order 5500.1) described in greater detail in Section 9.7.

The funds are allocated in the three segments: Primary Airport Allocation, Non-Primary Airport Allocation, and Contract Towers.

- **Primary Airports** – Program includes $2.39 billion per year for primary airports such as CRW. AIG funds for primary airports are to be allocated based on enplaned passengers.
- **Non-Primary Airports** – Program includes $500 million per year for non-primary (general aviation) airports.

- **Contract Towers** - The program includes a competitive $100 million ($20 million annually) specifically for airport-owned contract ATCT.
- The FAA announced on December 16, 2021, that it had allocated approximately $2.1 million of funding for the first year of AIG funding (FY 2022) to the Authority for the airport. The funding allocation for FY 2022 was based on the airport's pro-rata share of nationwide enplanements in CY 2019. Going forward, future AIG grants will be allocated based on the airport's share of enplaned passengers from the prior calendar year (e.g., FY 2023 AIG grants will be allocated based on CY 2022 enplaned passengers by airport nationwide).

### A.3.3 Airport Terminal Program

The Airport Terminal Program is a new program for airports under the BIL. The ATP provides grants to eligible airports for capital improvements for airport terminal development generally defined as development of an airport passenger terminal building, including terminal gates; access roads servicing exclusively airport traffic that leads directly to or from an airport passenger terminal building; walkways that lead directly to or from an airport passenger terminal building; multimodal terminal development; and projects for on-airport rail access projects; as well as projects for relocating, reconstructing, repairing or improving an airport-owned ATCT.

In total, ATP Grants of $5 billion will be awarded to airports in the amount of $1 billion each year for the next five years. These funds are further allocated to airports based on their size as defined by the FAA. In the case of CRW, which is defined as a non-hub primary airport, up to 10 percent, or $500 million total, will be allocated to non-hub primary airports over the next five years.

Eligible airport capital improvements included the development of an airport passenger terminal building, including terminal gates; access roads servicing exclusively airport traffic that leads directly to or from an airport passenger terminal building; walkways that lead directly to or from an airport passenger terminal building; multimodal terminal development; and projects for on-airport rail access projects; as well as projects for relocating, reconstructing, repairing or improving an airport-owned ATCT. For non-hub primary airports such as CRW, eligible ATP projects are eligible for up to a 95 percent match by the FAA.

**Table A-1** shows the amount of ATP funding that the Authority expects to submit an application for over each of the next five years. On March 28, 2022, the Authority submitted an application to the FAA for ATP funds under the BIL requesting $12.2 million in ATP funding for 2022. In total, over the next five years, the Authority plans to request approximately $213 million of ATP funds. However, since the ATP grants are considered competitive grants, there is no guarantee that the Authority will receive these requested funds.

**Table A-1 ATP Grant Request by Phase ($ Millions)**

| Phase | Construction Cost | Design Cost for Next Phase | Phase Total | ATP Eligible Share | Local Share[1] |
|---|---|---|---|---|---|
| Phase 1 | $9.6 | $3.3 | $12.9 | $12.2 | $0.6 |
| Phase 2 | $36.0 | $2.9 | $38.9 | $32.7 | $6.2 |
| Phase 3 | $32.3 | $5.8 | $38.0 | $31.0 | $7.1 |
| Phase 4 | $63.3 | $8.3 | $71.7 | $57.3 | $14.4 |
| Phase 5 | $91.8 | $0.0M | $91.8 | $79.8 | $12.0 |
| **Total** | **$233.0** | **$20.3** | **$253.3** | **$213.0** | **$40.3** |

1 Airport or tenant funded
Note: Amounts may not add to total due to rounding.
Source: L&B and ADCI Corp analysis

## A.4 Rebuilding American Infrastructure with Sustainability and Equity Discretionary Grant Program

RAISE discretionary grants, which were originally created under the American Recovery and Reinvestment Act as TIGER grants, can be used for a wide variety of projects. A total of $1.5 billion RAISE discretionary grants are available for 2022, which represents a 50 percent increase in available funds compared to last year. In 2021, RAISE funded 90 projects in 47 states, the District of Columbia, and Guam.

RAISE projects are rigorously reviewed and selected based on merit. Projects will be evaluated on statutory criteria of safety, environmental sustainability, quality of life, economic competitiveness and opportunity, state of good repair, partnership, and innovation. New this year, under the Bipartisan Infrastructure Law, 2022 RAISE applications will also be evaluated on the criteria of mobility and community connectivity. The Department will assess projects for universal design and accessibility for travelers, as well as consider how proposals increase mobility for freight and supply chain efficiency.

At least $15 million in funding is guaranteed to go towards projects located in Areas of Persistent Poverty or Historically Disadvantaged Communities. Under the Bipartisan Infrastructure Law, RAISE expands the number of communities eligible for 100 percent federal share of funding, specifically those in rural communities, Areas of Persistent Poverty and Historically Disadvantaged Communities. To help reach this goal, the Department has launched a tool that will allow applicants to determine if their project location is considered as a Historically Disadvantaged Community.

For 2022, the Department is also encouraging applicants to consider how their projects can create workforce development opportunities. Applicants can be more competitive in the process if they are creating jobs with free and fair choice to join a union and good labor standard, creating jobs that underserved communities can access, or are supporting worker opportunities and training. Applicants are also encouraged to utilize registered apprenticeship and local and economic hire agreements.

## A.5 U.S. Economic Development Administration Grants

U.S. EDA grants help to fulfil national and regional economic development strategies designed to accelerate innovation and entrepreneurship, advance regional competitiveness, create higher-skill, living-wage jobs, generate private investment, and fortify and grow industry clusters. Through its competitive grant process, EDA evaluates all project applications to determine the extent to which they:

- Align with EDA’s investment priorities
- Address the creation and/or retention of high-quality jobs
- Document that the applicant can or will leverage other resources, both public and private, and demonstrate the applicant’s capacity to commence the proposed project promptly, to use funds quickly and effectively, and provide a clear scope of work that includes a description of specific, measurable project outputs.

EDA’s investment priorities provide an overarching framework to ensure planning to infrastructure construction contributes to local efforts to build, improve, or better leverage economic assets that allow businesses to succeed and regional economies to prosper and become more resilient. Eligible and competitive grant applications must be responsive to the evaluation criteria listed under each individual funding announcement by the U.S. EDA, including at least one of the below investment priorities:

- Equity
- Recovery & Resilience
- Workforce Development
- Manufacturing
- Technology-Based Economic Development
- Environmentally-sustainable Development
- Exports & Foreign Direct Investment

On October 8, 2020, the U.S. Department of Commerce’s EDA announced an award of a $1.2 million grant to the Authority to make infrastructure improvements needed to support the growth of aerospace businesses at the Yeager Aviation Business Park. These funds are being used to fund the Eagle Mountain Road Sewer Line Extension and the Marshall Aircraft Apron projects. In addition, another $4 million of U.S. EDA grants are estimated to help fund the planned Aeronautic Economic Development Center at the airport.

## A.6 State of West Virginia Funds

The WVDOT Aeronautics Commission administers grant programs to encourage and support needed capital improvements to the state's public airports. The grant program is supported by the state tax on aircraft fuel and general revenue funds. Airports that meet the criteria for FAA AIP funds also qualify for funding from the state program. Currently, airports that meet the Aeronautics Commission's criteria can qualify for up to half of the local share required to match FAA funds. As a result, depending on the eligibility and actual funding levels received from other federal sources, the terminal project could be eligible for one half of the remaining amount.

In addition to the grant program, the State of West Virginia has a large budget surplus. CRW officials have requested $86 million in state funds be allocated to various projects at CRW, including $42 million for the replacement terminal.

## A.7 Passenger Facility Charges

PFCs may be used by an airport to fund the local share of eligible project costs. PFC eligibility for projects generally follow the same general guidelines for determining AIP grant eligibility outlined earlier. In accordance with the Aviation Safety and Capacity Expansion Act of 1990, as amended by the Aviation Investment and Reform Act for the 21st Century, CRW is currently imposing a $4.50 PFC at the airport.

Section 47119 of U.S. Code Title 49 (49 USC § 47119) defines PFC-eligible space within terminal development projects as non-revenue producing public-use areas that are directly related to the movement of passengers and baggage in terminal facilities within the boundaries of the airport. According to PFC guidelines (FAA Order 5500.1), terminal development projects directly related to the movement of passengers and baggage through non-revenue producing public-use areas are eligible for PFC funding. Non-revenue producing public use spaces are those areas that passengers may need to occupy as part of their air travel, and include areas associated with baggage claim delivery, passenger screening areas, central waiting rooms, baggage handling equipment, public-use corridors, and restrooms. Revenue-producing areas designated for restaurants and concession space are generally not eligible for PFC funding; however, per FAA Order 5500.1, Section 2, at non-hub primary, non-primary commercial service, and reliever airports, public use terminal space for gates, airline ticketing areas, passenger check-in areas, restaurants, car rental facilities, and other concessions are eligible regardless of their revenue-producing status.

Prior to the COVID-19 pandemic, CRW collected just under $1.0 million in PFC revenues each year. Currently, a portion of CRW's PFC collections are being used to pay for the debt service (approximately $404,000 per year) associated with CRW's PFC Series 2020A and Series 2020B bonds. The proceeds from these existing PFC bonds are currently planned to be used to fund approximately $4.2 million of eligible PFC project costs. It is estimated that all of CRW's PFCs are committed toward other projects at this time. Over time, however, as enplanements recover to pre-pandemic levels and continue to grow at CRW (or alternatively, if Congress increases the PFC collection amount above $4.50), more PFC funding capacity could be available in the future.

## A.8 Airport Funds (including Airport cash and bond funds)

The balance of project costs (i.e., after consideration of FAA, Federal relief and BIL funds, RAISE Grants, U.S. EDA funds, State grants, PFC, and other funding sources) must be funded by the airport. Local funding of airport improvements can come from airport cash or through the issuance of bonds or other debt.

Any additional local funding beyond what can be funded from an airport's cash reserves, would require the issuance of General Airport Revenue Bonds (GARBs). The use of GARBs will likely have an impact on CRW's airline cost per enplanement, since debt service associated with GARBs are typically included in the airline rate base. Depending on the exact timing and magnitude of future capital expenditures, it may be necessary to issue future debt to help defray upfront expenditures and mitigate the impacts to its available cash balances.

## A.9 Maximum Eligibility Analysis

Based on every potential funding source's eligibility and grant matching thresholds discussed above, an eligibility analysis was performed focused on those project elements that are part of the terminal development program. Generally, PFC eligibility guidelines typically provide the maximum funding eligibility levels for each project. As such, PFC eligibility guidelines for were used to determine the "maximum eligibility" for each project element as part of the terminal development project.

Depending on the funding source, however, the actual funding level could be less than the maximum eligibility level calculated using the PFC guidelines. For example, for terminal buildings, PFC eligibility is based on the type of space within the terminal as described above. If, for example, the maximum PFC eligible amount for the terminal building was determined to be 85 percent and the funding source were to be the BIL ATP fund (which has a maximum FAA matching share of 95 percent of the eligible terminal space), then the resulting eligible amount would be 80.75 percent, or 95 percent of 85 percent. For an airfield project, however, which is eligible for PFCs up to 100 percent that is to be funded with FAA entitlement funds, the total eligible amount would be 90 percent, or 90 percent of 100 percent.

**Table A-2** through **Table A-6** present the terminal development eligibility analysis conducted for Phases 1 through 5, broken down by specific project element. As shown in each table, the maximum eligibility for each project element generally ranges from 80 percent to 100 percent for each project by phase depending on the project type (i.e., airfield, terminal, roadway, etc.) and L&B's review of the PFC-eligible space within the terminal building. The maximum eligibility levels estimated for other projects such as those for design, utilities, and miscellaneous costs are based on a general allocation or a proration of those costs to specific projects and their eligibility levels.

Based on the eligibility analysis, it was estimated that a maximum amount of approximately $222.5 million of the $254 million terminal program, or 87.6 percent, could be eligible using PFC guidelines. The remaining $31.4 million constitutes the lowest amount that would be ineligible for funding. Depending on the actual funding source used to fund each project element, the share of costs that are funded with matching funds could potentially be lower than $222.5 million, or 87.6 percent, thereby increasing the amount of ineligible costs.

**Table A-2 Terminal Program Eligibility – Phase 1 ($ Millions)**

| Project Element | Phase 1 Costs by Project | | | Total Terminal Program Costs by Project | | |
|---|---|---|---|---|---|---|
| | Cost | Max Eligible % | Max Eligible Amount | Cost | Max Eligible % | Max Eligible Amount |
| Design | $0.7 | 87.2 | $0.6 | $21.0 | 88.0 | $18.5 |
| Terminal Building | | 84.3 | | 109.3 | 84.7 | 92.5 |
| Loading Bridges | | 100.0 | | 4.2 | 100.0 | 4.2 |
| Airfield & Apron | 1.8 | 100.0 | 1.8 | 12.3 | 100.0 | 12.3 |
| Enabling Projects | 0.9 | 84.3 | 0.7 | 8.7 | 88.2 | 7.7 |
| Roadway | | 100.0 | | 7.3 | 100.0 | 7.3 |
| Utilities | 2.6 | 84.3 | 2.2 | 3.3 | 84.1 | 2.8 |
| Miscellaneous | 4.3 | 87.2 | 3.8 | 87.8 | 88.0 | 77.3 |
| **Total** | **$10.3** | **88.5%** | **$9.1** | **$253.9** | **87.6%** | **$222.5** |

Note: Amounts may not add to total due to rounding.
Source: L&B and ADCI Corp analysis

**Table A-3 Terminal Program Eligibility– Phase 2 ($ Millions)**

| Project Element | Phase 2 Costs by Project | | | Total Terminal Program Costs by Project | | |
|---|---|---|---|---|---|---|
| | Cost | Max Eligible % | Max Eligible Amount | Cost | Max Eligible % | Max Eligible Amount |
| Design | $3.3 | 88.5 | $2.9 | $21.0 | 88.0 | $18.5 |
| Terminal Building | 19.0 | 87.3 | 16.6 | 109.3 | 84.7 | 92.5 |
| Loading Bridges | 1.8 | 100.0 | 1.8 | 4.2 | 100.0 | 4.2 |
| Airfield & Apron | | 100.0 | | 12.3 | 100.0 | 12.3 |
| Enabling Projects | | 87.3 | | 8.7 | 88.2 | 7.7 |
| Roadway | | 100.0 | | 7.3 | 100.0 | 7.3 |
| Utilities | 0.2 | 87.3 | 0.1 | 3.3 | 84.1 | 2.8 |
| Miscellaneous | 15.0 | 88.5 | 13.3 | 87.8 | 88.0 | 77.3 |
| **Total** | **$39.2** | **88.5%** | **$34.7** | **$253.9** | **87.6%** | **$222.5** |

Note: Amounts may not add to total due to rounding.
Source: L&B and ADCI Corp analysis

**Table A-4 Terminal Program Eligibility – Phase 3 ($ Millions)**

| Project Element | Phase 3 Costs by Project | | | Total Terminal Program Costs by Project | | |
|---|---|---|---|---|---|---|
| | Cost | Max Eligible % | Max Eligible Amount | Cost | Max Eligible % | Max Eligible Amount |
| Design | $2.9 | 84.6 | $2.5 | $21.0 | 88.0 | $18.5 |
| Terminal Building | 16.8 | 81.9 | 13.7 | 109.3 | 84.7 | 92.5 |
| Loading Bridges | 1.2 | 100.0 | 1.2 | 4.2 | 100.0 | 4.2 |
| Airfield & Apron | 0.9 | 100.0 | 0.9 | 12.3 | 100.0 | 12.3 |
| Enabling Projects | | 81.9 | | 8.7 | 88.2 | 7.7 |
| Roadway | 0.7 | 100.0 | 0.7 | 7.3 | 100.0 | 7.3 |
| Utilities | 0.2 | 81.9 | 0.1 | 3.3 | 84.1 | 2.8 |
| Miscellaneous | 12.6 | 84.6 | 10.6 | 87.8 | 88.0 | 77.3 |
| **Total** | **$35.2** | **84.5%** | **$29.7** | **$253.9** | **87.6%** | **$222.5** |

Note: Amounts may not add to total due to rounding.
Source: L&B and ADCI Corp analysis

**Table A-5 Terminal Program Eligibility – Phase 4 ($ millions)**

| Project Element | Phase 4 Costs by Project | | | Total Terminal Program Costs by Project | | |
|---|---|---|---|---|---|---|
| | Cost | Max Eligible % | Max Eligible Amount | Cost | Max Eligible % | Max Eligible Amount |
| Design | $5.8 | 83.5 | $4.8 | $21.0 | 88.0 | $18.5 |
| Terminal Building | 31.6 | 78.8 | 24.9 | 109.3 | 84.7 | 92.5 |
| Loading Bridges | | 100.0 | | 4.2 | 100.0 | 4.2 |
| Airfield & Apron | 1.9 | 100.0 | 1.9 | 12.3 | 100.0 | 12.3 |
| Enabling Projects | 0.2 | 78.8 | 0.2 | 8.7 | 88.2 | 7.7 |
| Roadway | 6.6 | 100.0 | 6.6 | 7.3 | 100.0 | 7.3 |
| Utilities | 0.2 | 78.8 | 0.2 | 3.3 | 84.1 | 2.8 |
| Miscellaneous | 22.8 | 83.5 | 19.0 | 87.8 | 88.0 | 77.3 |
| **Total** | **$69.1** | **83.4%** | **$57.6** | **$253.9** | **87.6%** | **$222.5** |

Note: Amounts may not add to total due to rounding.
Source: L&B and ADCI Corp analysis

**Table A-6 Terminal Program Eligibility – Phase 5 ($ Millions)**

| Project Element | Phase 5 Costs by Project | | | Total Terminal Program Costs by Project | | |
|---|---|---|---|---|---|---|
| | Cost | Max Eligible % | Max Eligible Amount | Cost | Max Eligible % | Max Eligible Amount |
| Design | $8.3 | 92.2 | $7.7 | $21.0 | 88.0 | $18.5 |
| Terminal Building | 42.0 | 89.0 | 37.4 | 109.3 | 84.7 | 92.5 |
| Loading Bridges | 1.2 | 100.0 | 1.2 | 4.2 | 100.0 | 4.2 |
| Airfield & Apron | 7.7 | 100.0 | 7.7 | 12.3 | 100.0 | 12.3 |
| Enabling Projects | 7.6 | 89.0 | 6.8 | 8.7 | 88.2 | 7.7 |
| Roadway | | 100.0 | | 7.3 | 100.0 | 7.3 |
| Utilities | 0.2 | 89.0 | 0.1 | 3.3 | 84.1 | 2.8 |
| Miscellaneous | 33.1 | 92.2 | 30.5 | 87.8 | 88.0 | 77.3 |
| **Total** | **$100.1** | **91.3%** | **$91.4** | **$253.9** | **87.6%** | **$222.5** |

Note: Amounts may not add to total due to rounding.
Source: L&B and ADCI Corp analysis

**Table A-7 and Table A-8** present a summary of the eligibility levels and funding available to CRW by funding source. Other potential sources of funding not identified above are also shown. The tables present the specific project elements eligible for funding by each funding source. For example, FAA AIP Entitlement grants are eligible for up to 90 percent for federal funding and would most likely be used toward airfield, apron, and their associated design costs. In addition, CRW is estimated to receive approximately $10 million in FAA AIP Entitlement grants over the next five years that could be applied toward airfield, apron, and their associated design costs.

## Table A-7 Terminal Program Eligibility by Funding Source ($ Millions)

| | | | FEDERAL GRANT FUNDS | | | | | FEDERAL BIL FUNDS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AIP Entitlement Grants | AIP Discretionary Grants | Supplemental Grants | Earmarks | Small Airport Fund | Airport Infrastructure Grants | Airport Terminal Program | FAA Facilities & Equipment |
| Matching Share (%) | [A] | | 90% | 90% | 90% | Unknown | 90% | 100.0% | 95.0% | 100% |
| Project Eligibility (%) | [B] | | 100% | 100% | 100% | Unknown | 100% | 87.6% | 87.6% | 100% |
| **Max Funding Share (%)** | **[C=AxB]** | | **90%** | **90%** | **90%** | **Unknown** | **90%** | **87.6%** | **83.3%** | **100%** |
| **Max Funding Available to CRW (2022 - 2026)** | | | **$10.0** | **$20.0** | **Unknown** | **Unknown** | **Unknown** | **$10.5** | **$211.4** | **Unknown** |
| **Project Element** | **Total Cost** | **Max Eligible Amount** | **Eligible Projects by Funding Source** | | | | | | | |
| Design | $21.0 | $18.5 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Terminal Building | 109.3 | 92.5 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Loading Bridges | 4.2 | 4.2 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Airfield & Apron | 12.3 | 12.3 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Enabling Projects | 8.7 | 7.7 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Roadway | 7.3 | 7.3 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Utilities | 3.3 | 2.8 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Miscellaneous | 87.8 | 77.3 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| **TOTAL** | **$253.9** | **$222.5** | | | | | | | | |

Note: Amounts may not add to total due to rounding.
Checkmarks show most likely eligibility for each project based on funding source. Other projects may be eligible for certain funding sources; however, they would be considered a lower priority for funding.

Source: L&B and ADCI Corp analysis

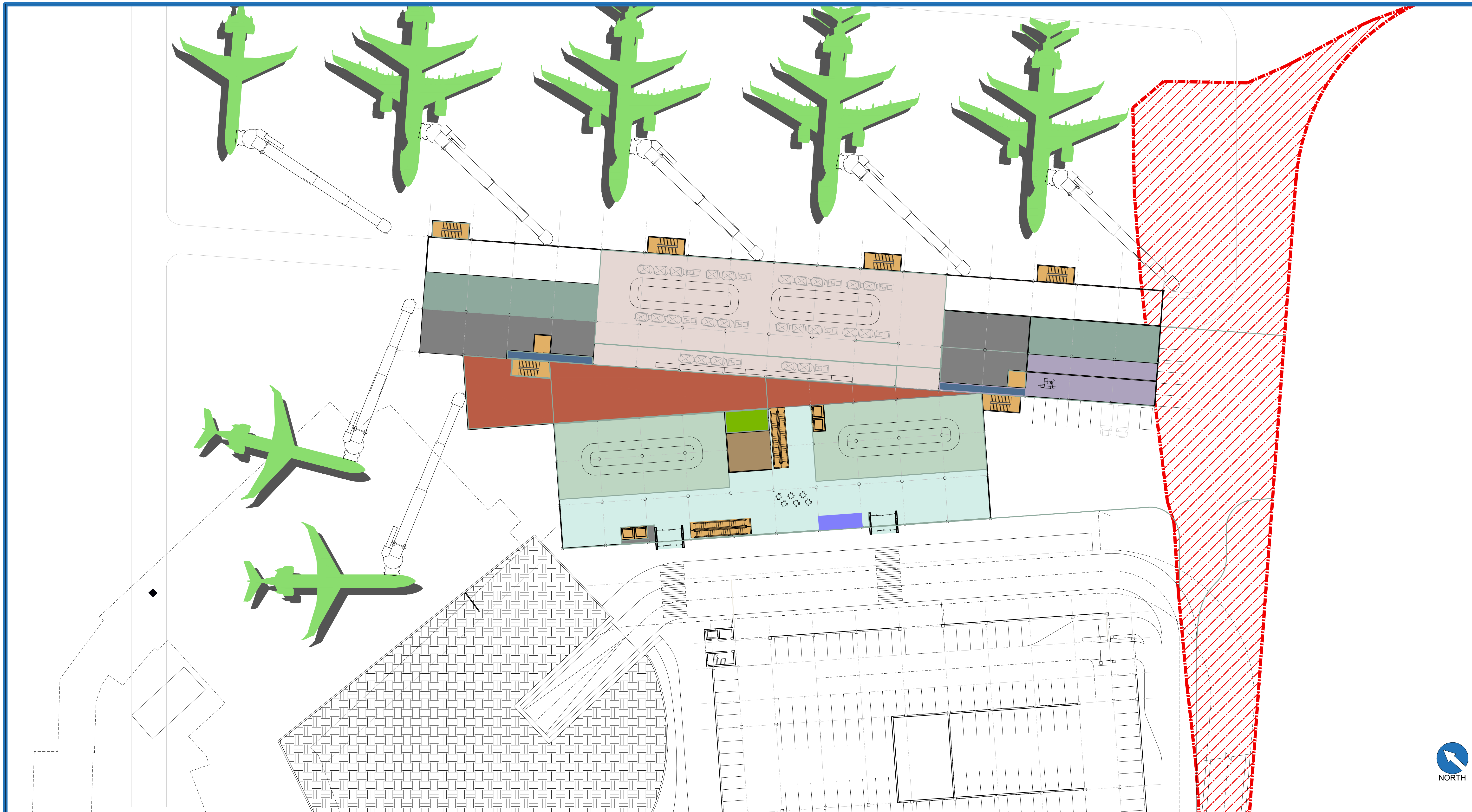
## Table A-8 Terminal Program Eligibility by Funding Source ($ Millions) – (Continued)

| | | | FEDERAL RELIEF FUNDS | | | OTHER FUNDS | | | | | LOCAL FUNDS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CARES Act Funds | CRRSA Act Funds | ARP Act Funds | RAISE Grant Program | U.S. EDA Grants | WVDOT Grants | State of WV Discretionary | City of Charleston Discretionary | PFCs | Airport Cash | Airport Bonds |
| Matching Share (%) | [A] | | 100% | 100% | 100% | 80% | 90% | 5% | Unknown | Unknown | 100.0% | 100% | 100% |
| Project Eligibility (%) | [B] | | 100% | 100% | 100% | 100% | 100% | 100% | Unknown | Unknown | 0.0% | 100% | 100% |
| **Max Funding Share (%)** | **[C=AxB]** | | **100%** | **100%** | **100%** | **80%** | **90%** | **5%** | **Unknown** | **Unknown** | **0.0%** | **100%** | **100%** |
| **Max Funding Available to CRW (2022 - 2026)** | | | **$2.9** | **$0.0** | **$3.1** | **Unknown** | **Unknown** | **Unknown** | **Unknown** | **Unknown** | **$0.0** | **$0.0** | **To Be Determined** |
| **Project Element** | **Total Cost** | **Max Eligible Amount** | **Eligible Projects by Funding Source** | | | | | | | | | | |
| Design | $21.0 | $18.5 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Terminal Building | 109.3 | 92.5 | | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Loading Bridges | 4.2 | 4.2 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Airfield & Apron | 12.3 | 12.3 | ✔ | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Enabling Projects | 8.7 | 7.7 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Roadway | 7.3 | 7.3 | | | | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Utilities | 3.3 | 2.8 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Miscellaneous | 87.8 | 77.3 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| **TOTAL** | **$253.9** | **$222.5** | | | | | | | | | | | |

Note: Amounts may not add to total due to rounding.
Checkmarks show most likely eligibility for each project based on funding source. Other projects may be eligible for certain funding sources; however, they would be considered a lower priority for funding.

Source: L&B and ADCI Corp analysis

# Appendix B – New Terminal Floorplans




# CRW
# First Floor Alternative 1A

File: 2022 0214 Preferred Concept 1A.dwg Layout: L1 Last Saved: 2/18/2022 5:26 PM Plotted On: 6/6/2022 8:04 AM

**Legend**

- Restrooms
- Airport Operations
- BSO
- Baggage Make Up
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Baggage Handling System
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Concession Support
- Loading Dock
- Inbound Baggage
- Claim Area
- Airline Operations
- Amenities

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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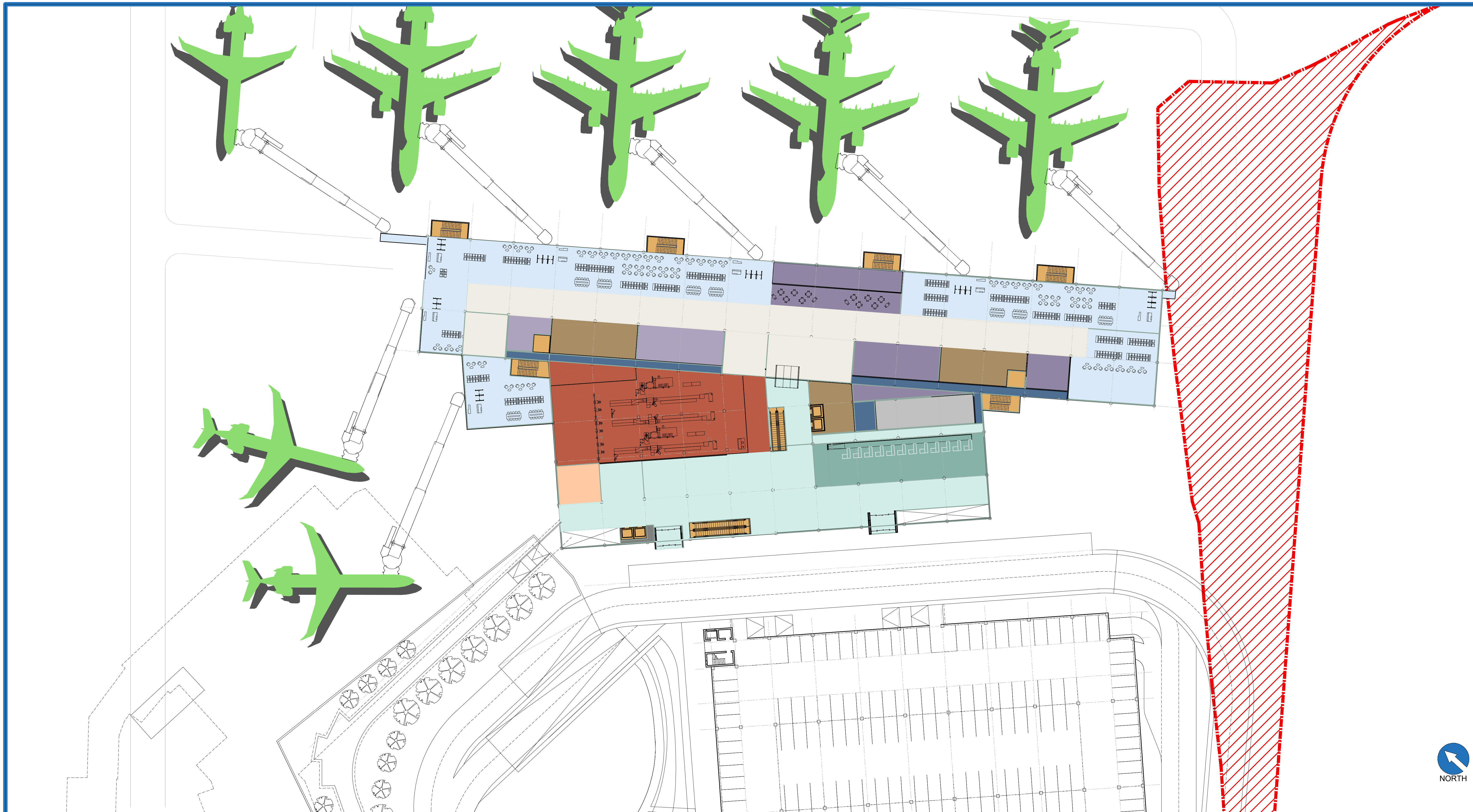


# CRW
# Second Floor Alternative 1A

File: 2022 0214 Preferred Concept 1A.dwg Layout: L2 Last Saved: 2/18/2022 3:18 PM Plotted On: 2/18/2022 4:16 PM

**Legend**

- Restrooms
- Airport Operations
- Checkpoint
- Concession Support
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Check-In
- ATO

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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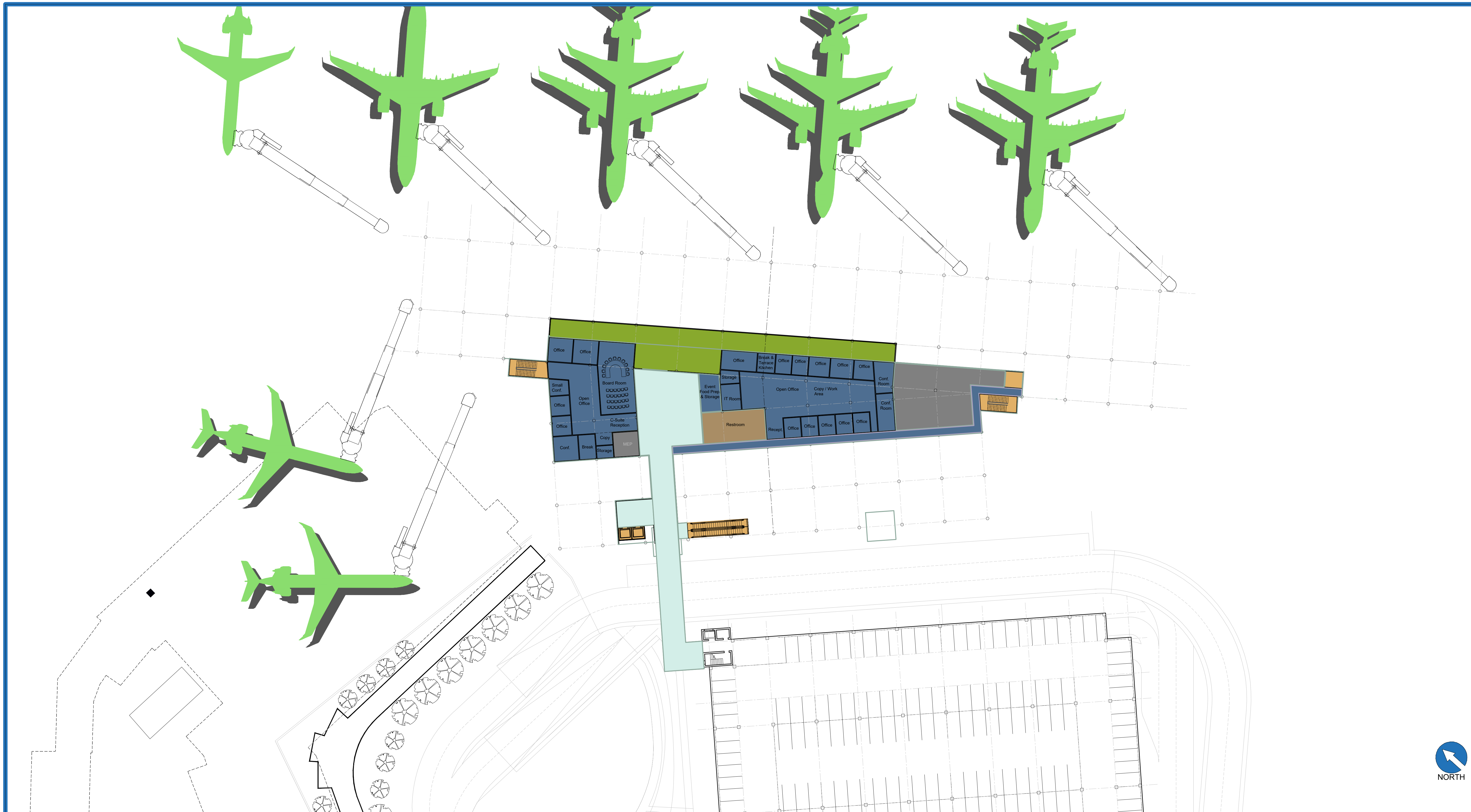


# CRW
# Third Floor Alternative 1A

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**Legend**

- Restrooms
- Airport Operations
- Vertical Circulation
- Support or MEP
- Secure Circulation
- Non-Secure Circulation
- Terrace

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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# CRW
# Third Floor Alternative 1A

File: 2022 0214 Preferred Concept 1A.dwg Layout: L3-Zoom Last Saved: 2/18/2022 5:26 PM Plotted On: 6/6/2022 8:07 AM

**Legend**
- Restrooms
- Airport Operations
- Vertical Circulation
- Support or MEP
- Secure Circulation
- Non-Secure Circulation
- Terrace

Scale: 1/32"=1'-0"

Source:
Prepared by: Landrum & Brown

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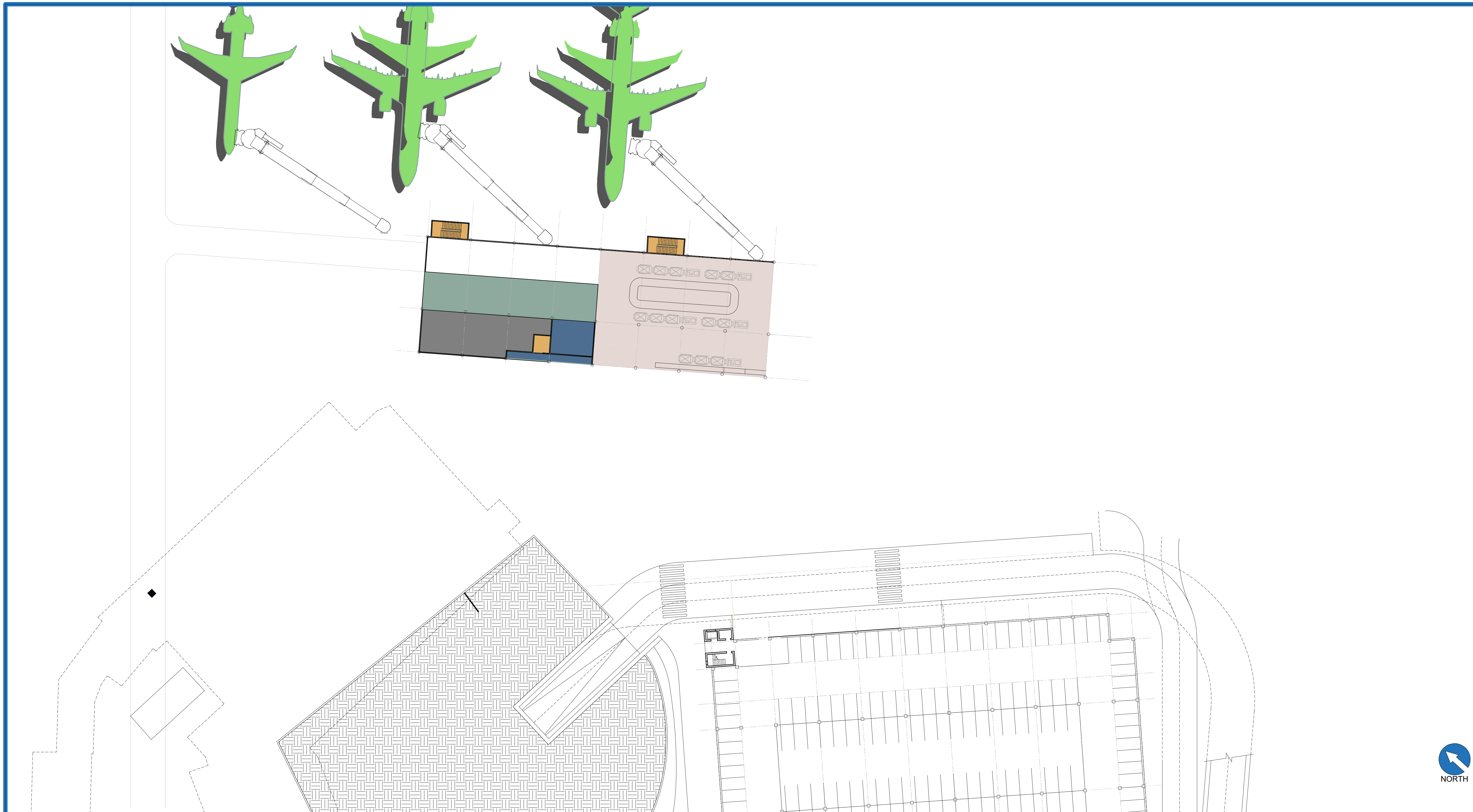
# Appendix C – Interior Phasing Plans




# CRW
# First Floor Phase 2

File: 2022 0310 Preferred Concept 1A.dwg Layout: L1-Phase 1A Last Saved: 3/11/2022 5:53 PM Plotted On: 6/6/2022 8:24 AM

**Legend**

- Restrooms
- Airport Operations
- BSO
- Baggage Make Up
- Secure Circulation
- Non-Secure Circulation
- Vertical Circulation
- Support or MEP
- Claim Area
- Airline Operations
- Amenities
- Loading Dock
- Inbound Baggage

L&B

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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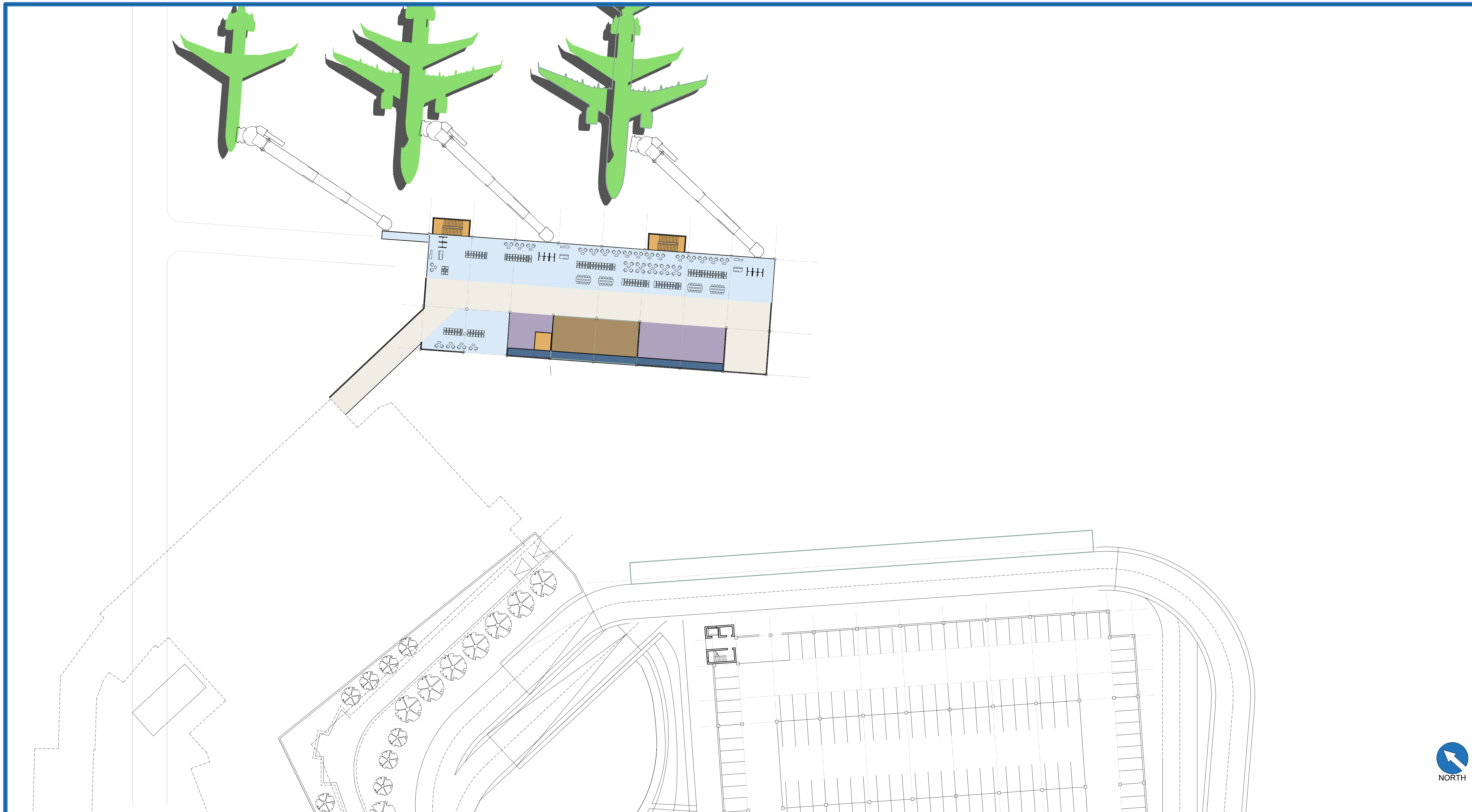


# CRW
# Second Floor Phase 2

File: 2022 0310 Preferred Concept 1A.dwg Layout: L2-Phase 1A Last Saved: 3/11/2022 5:53 PM Plotted On: 6/6/2022 8:25 AM

**Legend**

- Restrooms
- Airport Operations
- Checkpoint
- Concession Support
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Check-In
- ATO

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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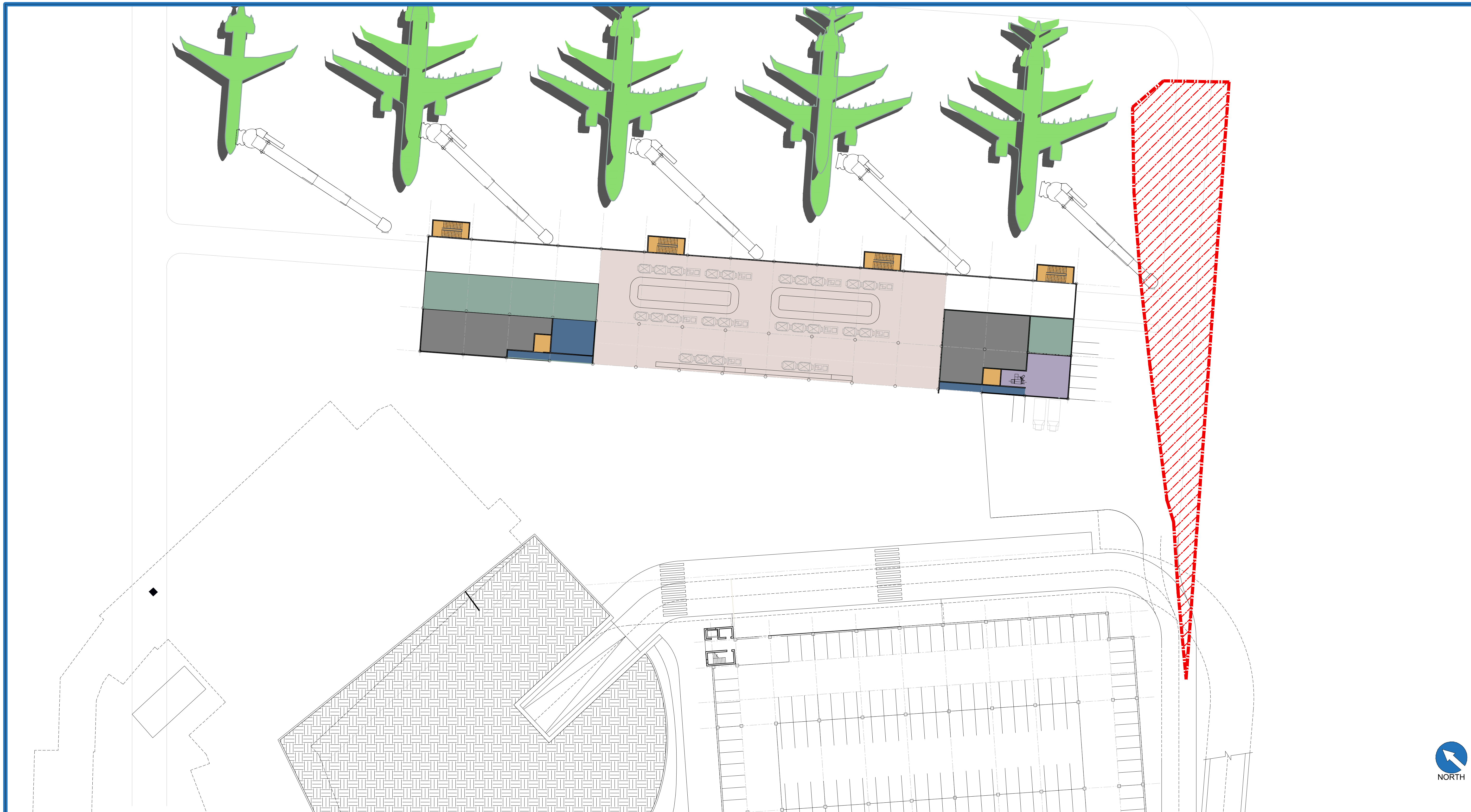



# CRW
# First Floor Phase 3

File: 2022 0310 Preferred Concept 1A.dwg Layout: L1-Phase 1B Last Saved: 3/11/2022 5:53 PM Plotted On: 6/6/2022 8:25 AM

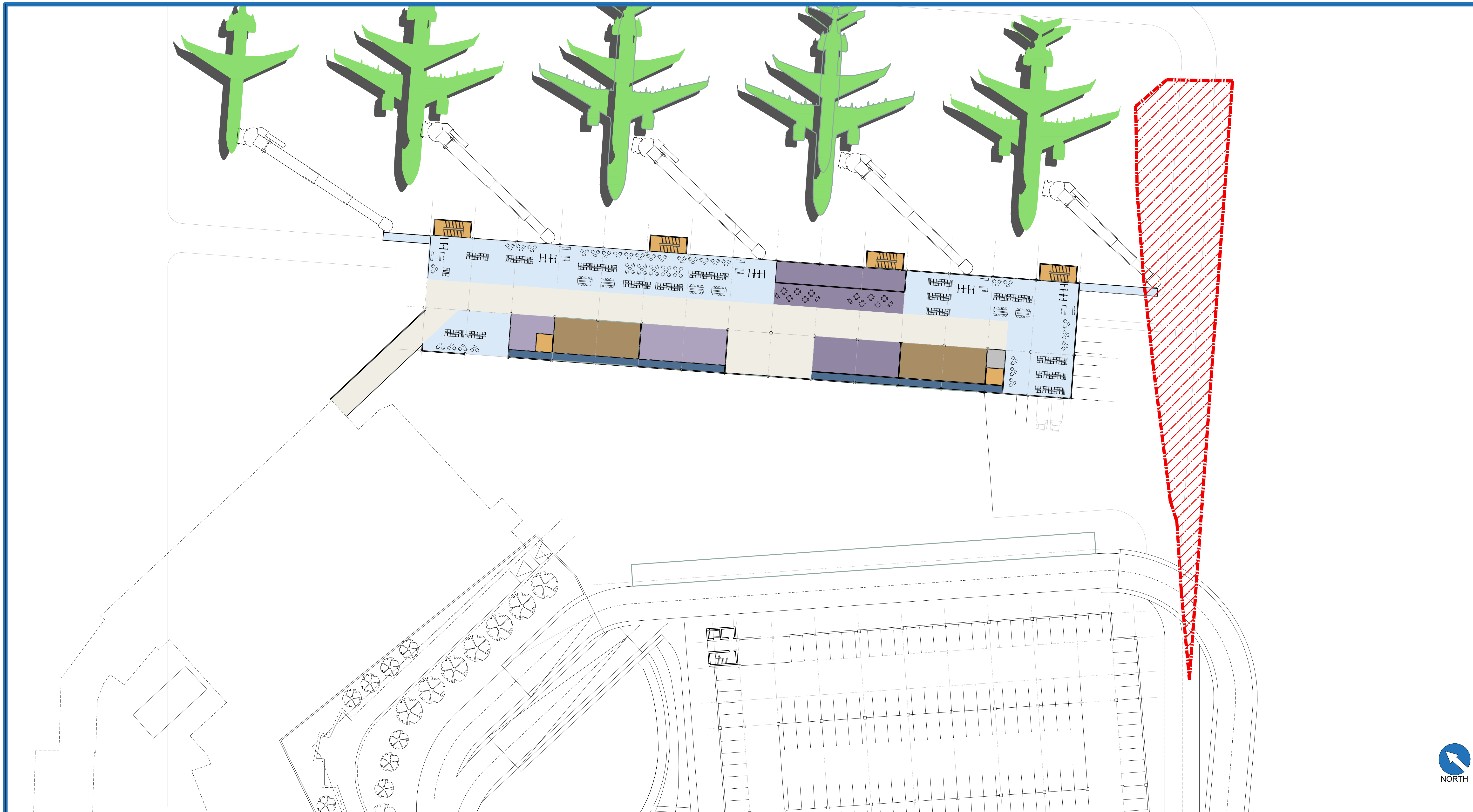
**Legend**

- Restrooms
- Airport Operations
- BSO
- Baggage Make Up
- Secure Circulation
- Non-Secure Circulation
- Vertical Circulation
- Support or MEP
- Claim Area
- Airline Operations
- Amenities
- Loading Dock
- Inbound Baggage

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

**CONFIDENTIAL - For discussion Purposes Only**




# CRW
# Second Floor Phase 3

File: 2022 0310 Preferred Concept 1A.dwg Layout: L2-Phase 1B Last Saved: 3/11/2022 5:53 PM Plotted On: 6/6/2022 8:26 AM

**Legend**

- Restrooms
- Airport Operations
- Checkpoint
- Concession Support
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Check-In
- ATO

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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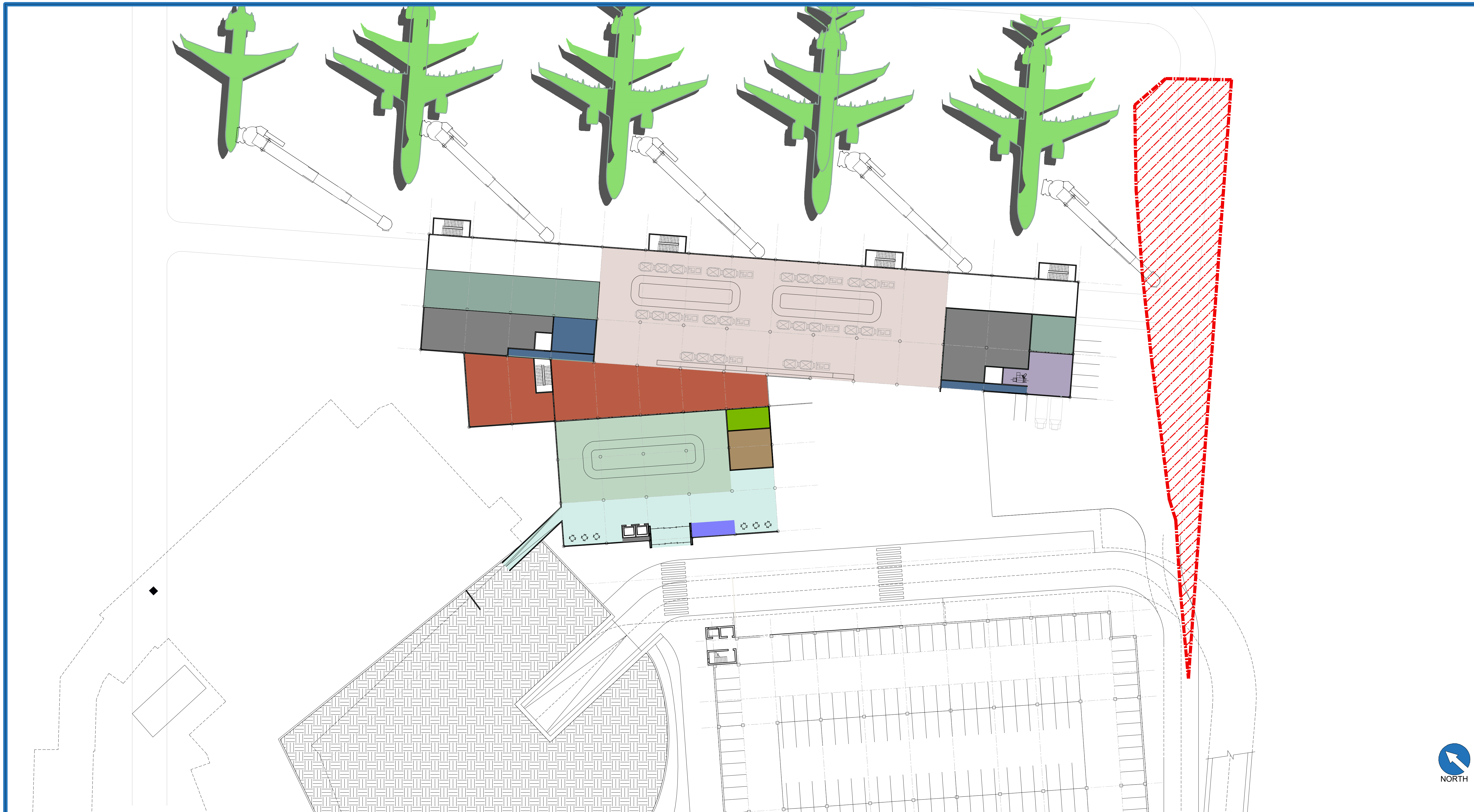


# CRW
# First Floor Phase 4

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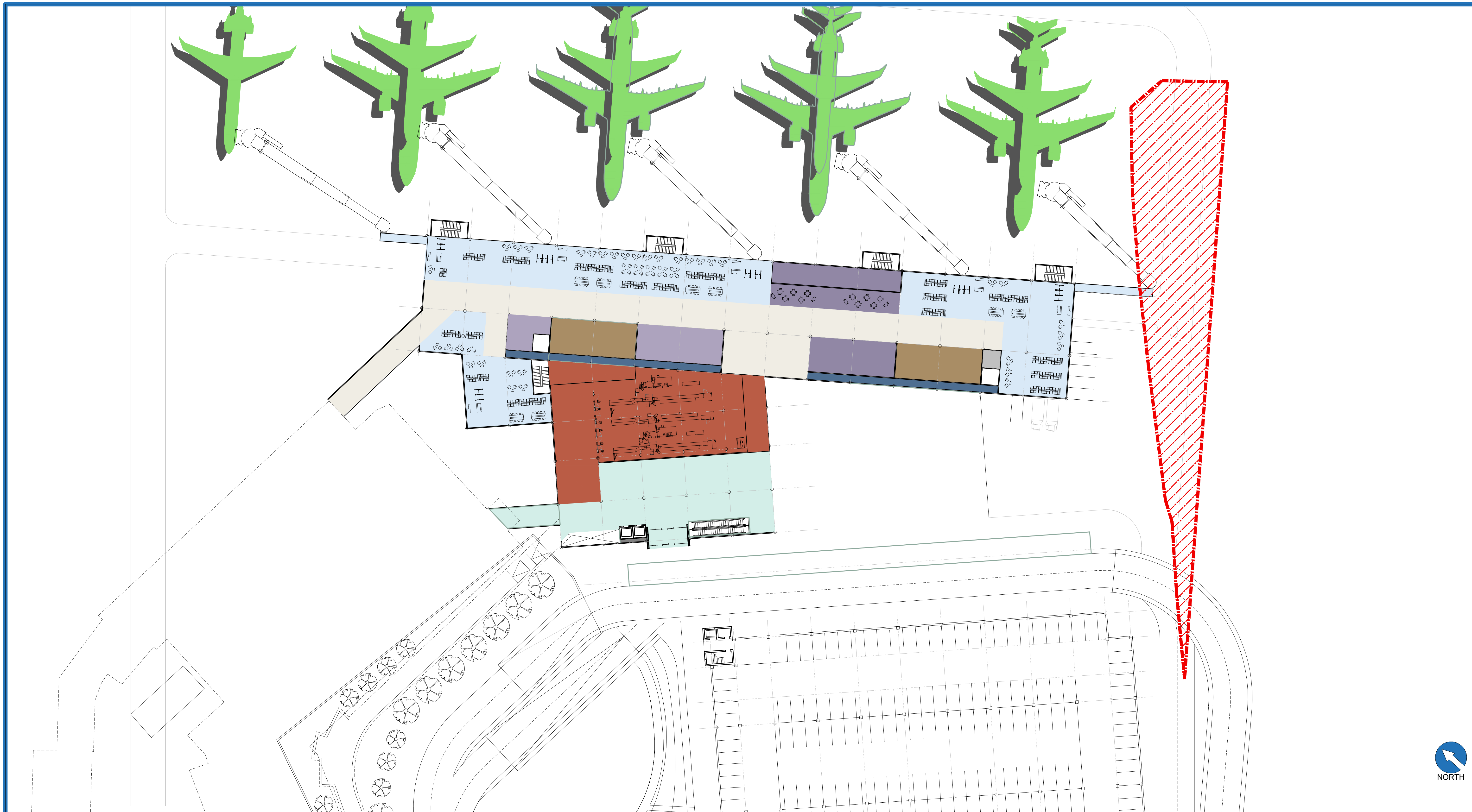
**Legend**

- Restrooms
- Airport Operations
- BSO
- Baggage Make Up
- Secure Circulation
- Non-Secure Circulation
- Vertical Circulation
- Support or MEP
- Claim Area
- Airline Operations
- Amenities
- Baggage Handling System
- Loading Dock
- Inbound Baggage

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

**CONFIDENTIAL - For discussion Purposes Only**




# CRW
# Second Floor Phase 4

File: 2022 0310 Preferred Concept 1A.dwg Layout: L2-Phase 2 Last Saved: 3/11/2022 5:53 PM Plotted On: 6/6/2022 8:27 AM

**Legend**

- Restrooms
- Airport Operations
- Checkpoint
- Concession Support
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Check-In
- ATO

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

**CONFIDENTIAL - For discussion Purposes Only**


# CRW
# Third Floor - Phase 4

File: 2022 0310 Preferred Concept 1A.dwg Layout: L3-Phase 2 Last Saved: 3/11/2022 5:53 PM Plotted On: 6/6/2022 8:27 AM

**Legend**

- Restrooms
- Airport Operations
- Vertical Circulation
- Support or MEP
- Secure Circulation
- Non-Secure Circulation
- Outdoor Terrace

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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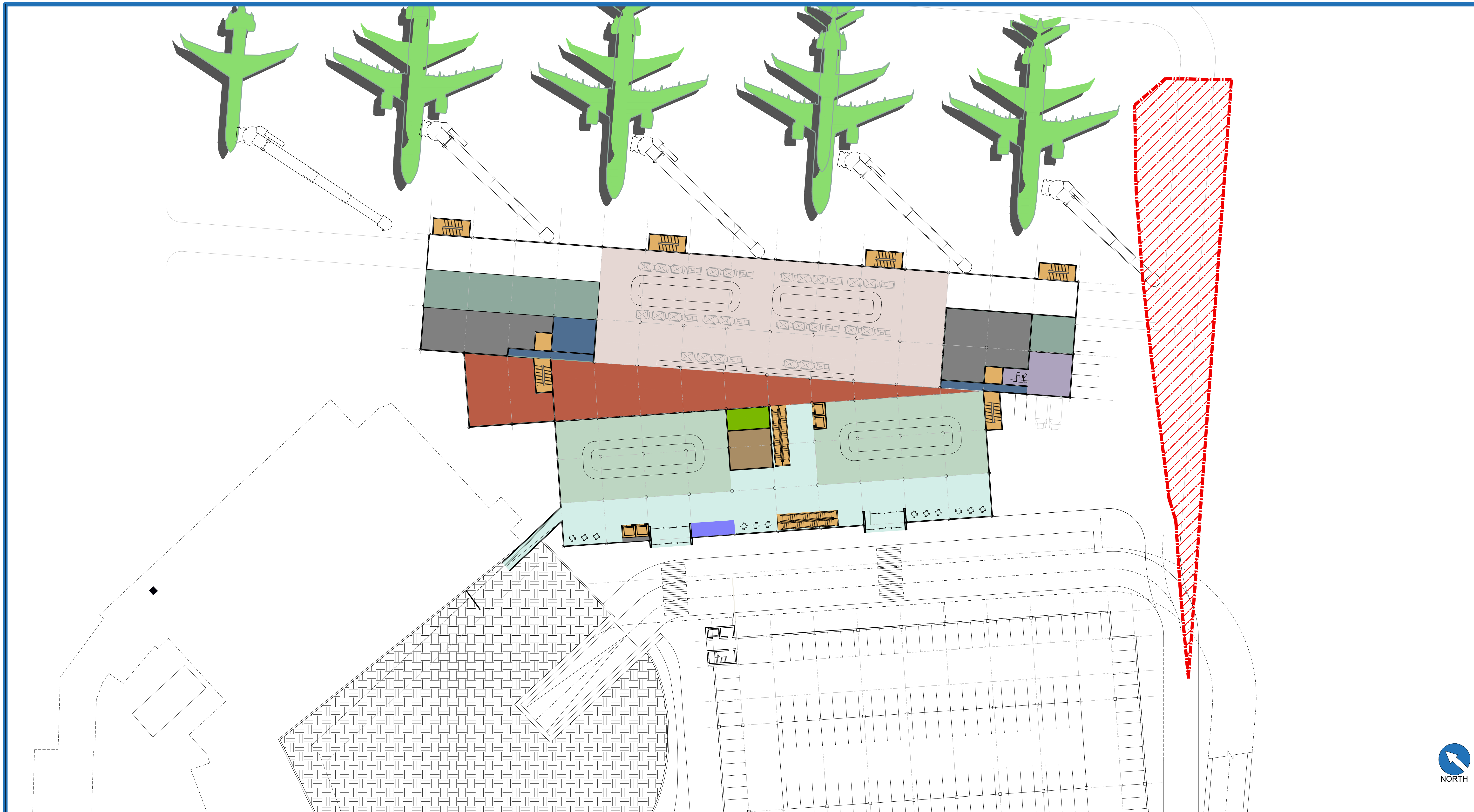


# CRW
# First Floor Phase 5

File: 2022 0310 Preferred Concept 1A.dwg Layout: L1-Phase 3 Last Saved: 3/11/2022 5:53 PM Plotted On: 6/6/2022 8:28 AM

**Legend**

- Restrooms
- Airport Operations
- BSO
- Baggage Make Up
- Secure Circulation
- Non-Secure Circulation
- Vertical Circulation
- Support or MEP
- Claim Area
- Airline Operations
- Amenities
- Baggage Handling System
- Loading Dock
- Inbound Baggage

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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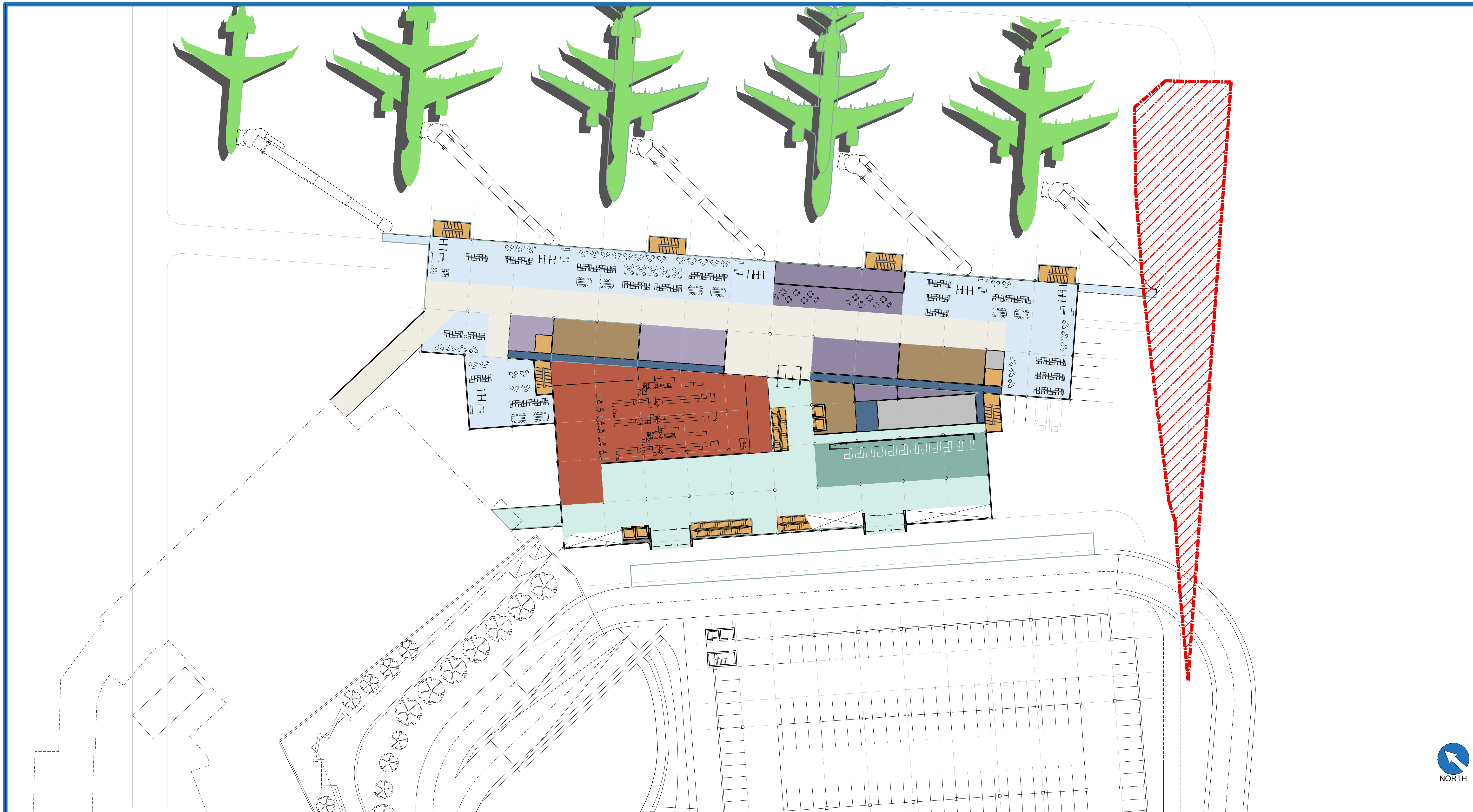


# CRW
# Second Floor Phase 5

File: 2022 0310 Preferred Concept 1A.dwg Layout: L2-Phase 3 Last Saved: 3/11/2022 5:53 PM Plotted On: 6/6/2022 8:28 AM

**Legend**

- Restrooms
- Airport Operations
- Checkpoint
- Concession Support
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Check-In
- ATO

Scale: 1/64"=1'-0"

Source:
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# CRW
# Third Floor - Phase 5

File: 2022 0310 Preferred Concept 1A.dwg Layout: L3-Phase 3 Last Saved: 3/11/2022 5:53 PM Plotted On: 6/6/2022 8:29 AM

**Legend**

- Restrooms
- Airport Operations
- Vertical Circulation
- Support or MEP
- Secure Circulation
- Non-Secure Circulation
- Outdoor Terrace

Scale: 1/64"=1'-0"

Source:
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# Appendix D – Presentations and Meeting Minutes

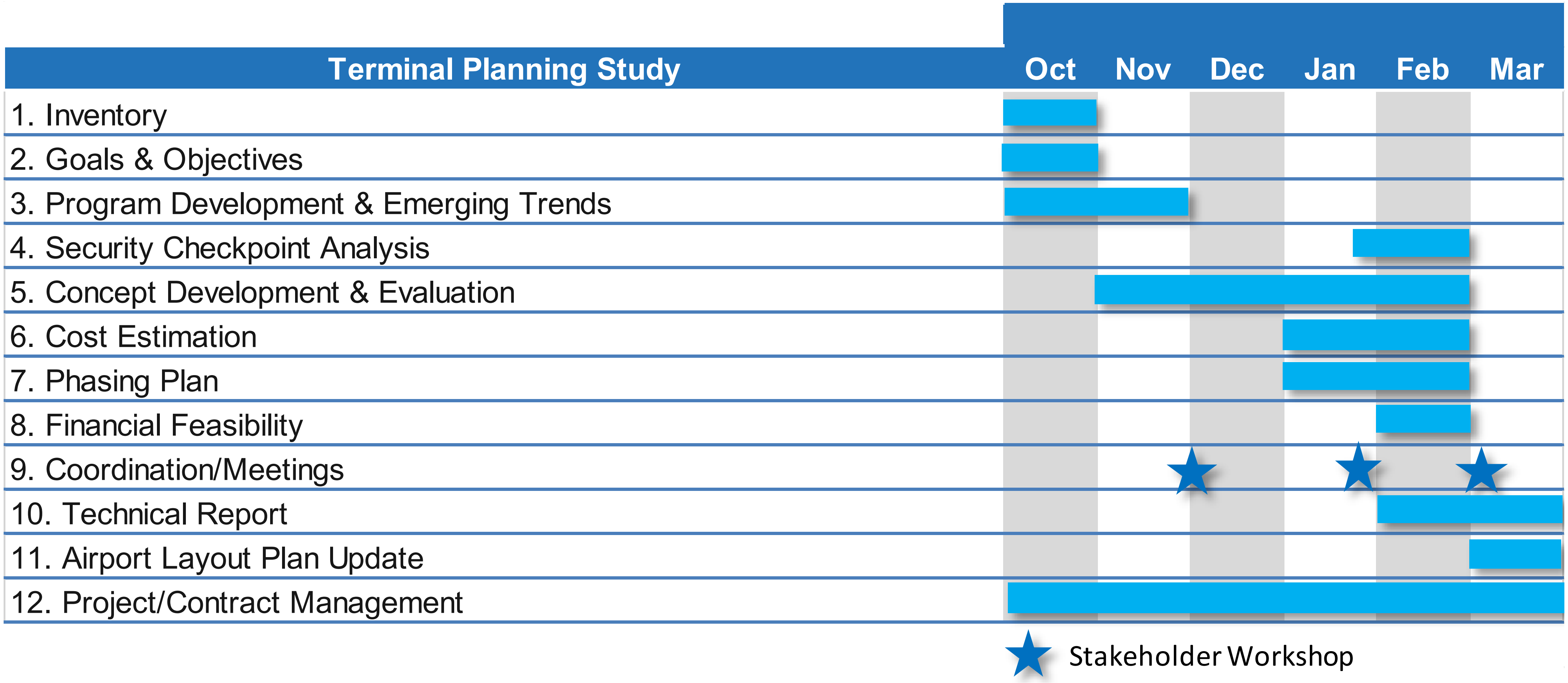
# TO 1401 – Terminal Planning Study
## Workshop 1

Landrum & Brown | December 2, 2021

# Agenda

- Project Schedule
- Goals & Objectives
- Forecast Review and Requirements
- Terminal Alternatives
- Next Steps

# Project Schedule



# Goal & Objectives

- Construct a new state-of-the-art airport terminal that enhances the passenger experience
- Maximize future flexibility by allowing for terminal and concourse expansion
- Provide airside gate flexibility to accommodate narrow-body aircraft and taxi capabilities
- Minimize impact to site constraints and maintain future use of existing parking and rental car operations
- Develop a feasible phasing approach to relocate operations into a new terminal facility
- Ensure construction and implementation costs are reasonable and feasible

# Forecast Review & Requirements

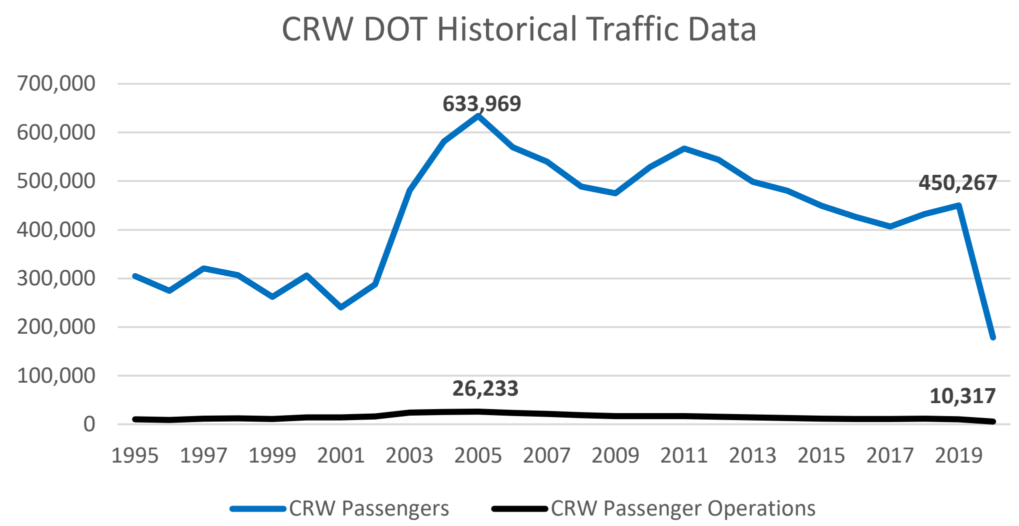
# Forecast Review and Gate Requirements

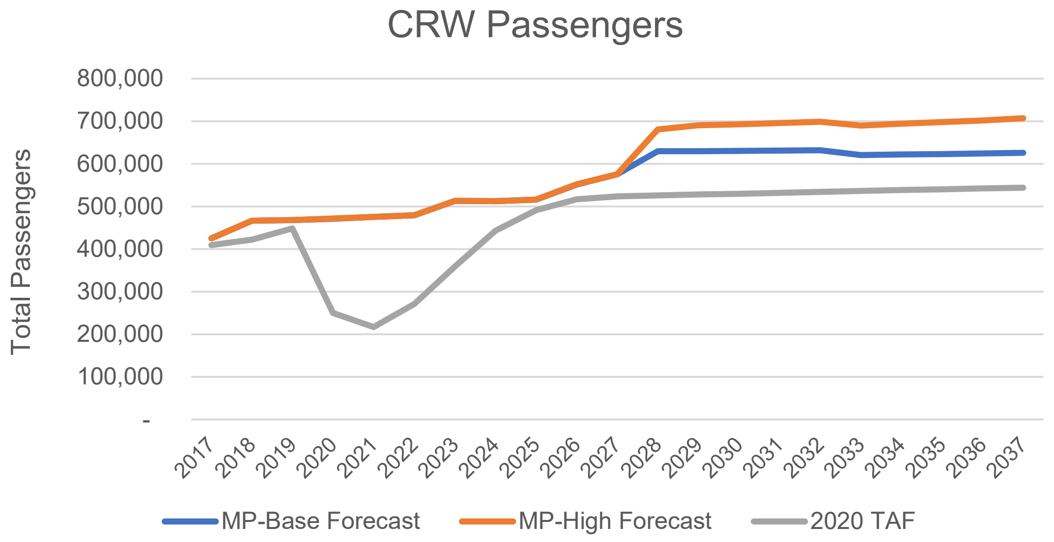
- Master Plan Forecasts and FAA TAF Overview
- Profile of Carrier Activity
- Benchmark Airport Comparison
- Design Day Flight Schedule Analysis
- Summary

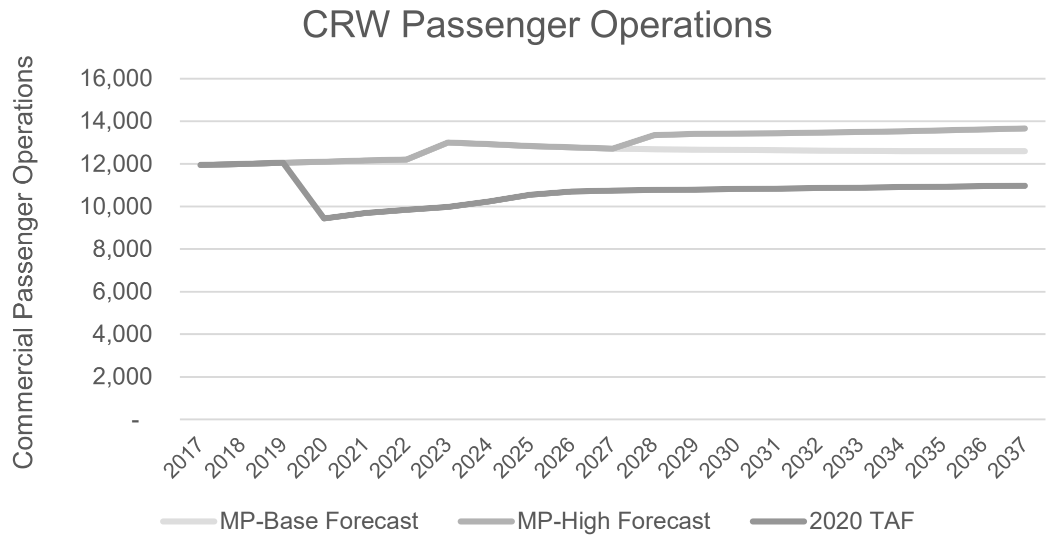
# Forecast Review

- Peak Annual Traffic = 2005 (~634k Pax, 26,200 Ops)
- 2019 Traffic Pre-COVID (~450k Pax, 10,300 Ops)

- 2020 FAA TAF (544k Pax, 10,974 Ops) FY 2037
- MP Base Case (626k Pax, 12,588 Ops) CY 2037
- MP High Case (707k Pax, 13,665 Ops) CY 2037

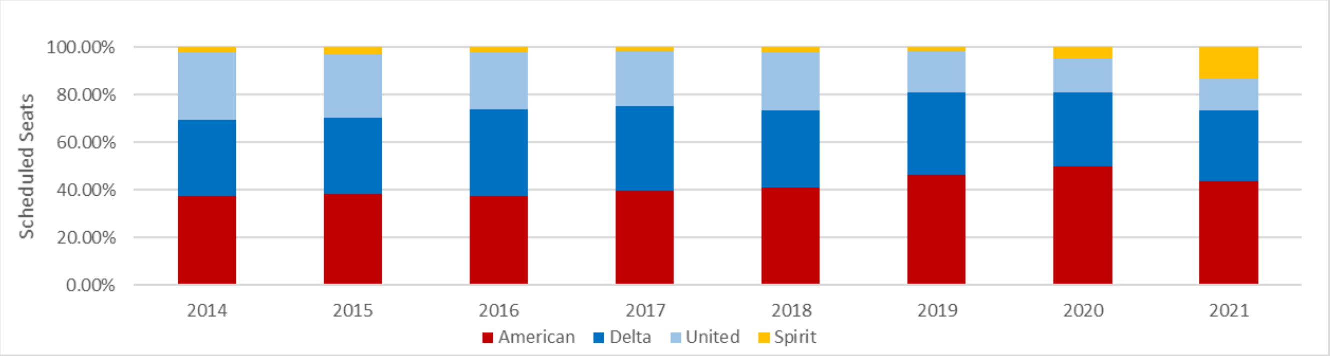


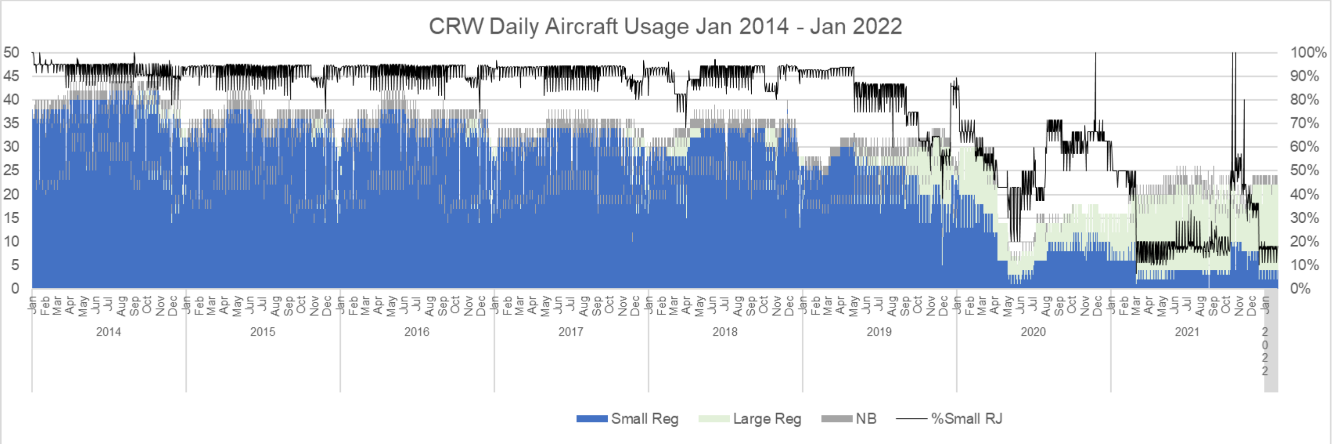



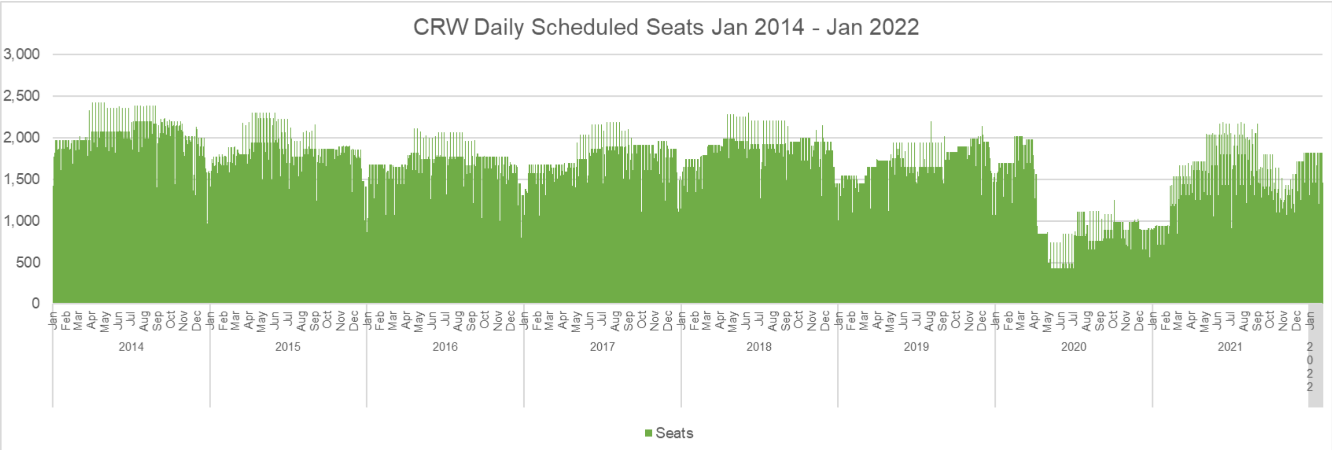



# Profile of Carrier Activity

- Fleets shifting to all large regional and narrowbody jets
- AA and DL provide roughly 2/3 of capacity, then UA and NK




# Benchmark Airports

- Review of Non/Small Hub Airports with ~700k to 1 million passengers and no Southwest service


| | BMI Bloomington, IL | **CRW Charleston, WV** | TRI Tri-Cities, TN | PIA Peoria, IL | ROA Roanoke, VA | CHO Charlottesville, VA | FWA Fort Wayne, IN | CAK Akron, OH | ABE Allentown, PA | CHA Chattanooga, TN |
|---|---|---|---|---|---|---|---|---|---|---|
| **2019 ACI Passengers** | 421,519 | **448,000** | 450,423 | 689,330 | 731,267 | 752,452 | 794,810 | 834,365 | 911,970 | 1,104,662 |
| **2019 Average Gauge** | 83.1 | **57.1** | 64.0 | 69.4 | 60.3 | 54.6 | 64.7 | 66.8 | 81.5 | 67.6 |
| **2019 Average Load Factor** | 82.0% | **75.2%** | 78.37% | 84.8% | 80.8% | 79.3% | 81.9% | 80.1% | 83.7% | 76.2% |
| | | | | | | | | | | |
| **Region** | Midwest | **Midwest** | Southern | Midwest | Southern | East | Midwest | Midwest | East | Southern |
| **MSA Population 2019** | 163,000 | **257,000** | 307,000 | 401,000 | 313,000 | 219,000 | 413,000 | 397,000 | 844,000 | 565,000 |
| **MSA GRP 2019 (Bil 2012 USD)** | 7.0 | **12.0** | 13.0 | 21.5 | 16.1 | 13.0 | 21.9 | 18.0 | 43.0 | 28.4 |
| | | | | | | | | | | |
| **Nearest Competitor** | PIA Peoria | **HTS Huntington** | TYS Knoxville | BMI Bloomington | INT Winston-Salem | RIC Richmond | SBN South Bend | CLE Cleveland | PHL Philadelphia | TYS Knoxville |
| **Distance (miles)** | 43 | **50** | 100 | 50 | 108 | 86 | 77 | 54 | 73 | 104 |
| | | | | | | | | | | |
| **# of Scheduled Airlines** | 4 | **4** | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 |
| **AA Share of Seats** | 38% | **46%** | 37% | 35% | 40% | 54% | 38% | 40% | 29% | 38% |
| **DL Share of Seats** | 30% | **34%** | 53% | 16% | 27% | 29% | 29% | 20% | 25% | 45% |
| **UA Share of Seats** | 0% | **17%** | 0% | 19% | 22% | 16% | 11% | 25% | 8% | 11% |
| **Share of Seats** | 15% (G4)/17% F9 | **2% (NK)** | 10% (G4/UP) | 30% (G4) | 11% (G4) | 0% | 22% (G4) | 15% (NK) | 37% (G4) | 6% (G4) |

# Airline Market Comparison

Markets added to Future CRW 2037 DDFS

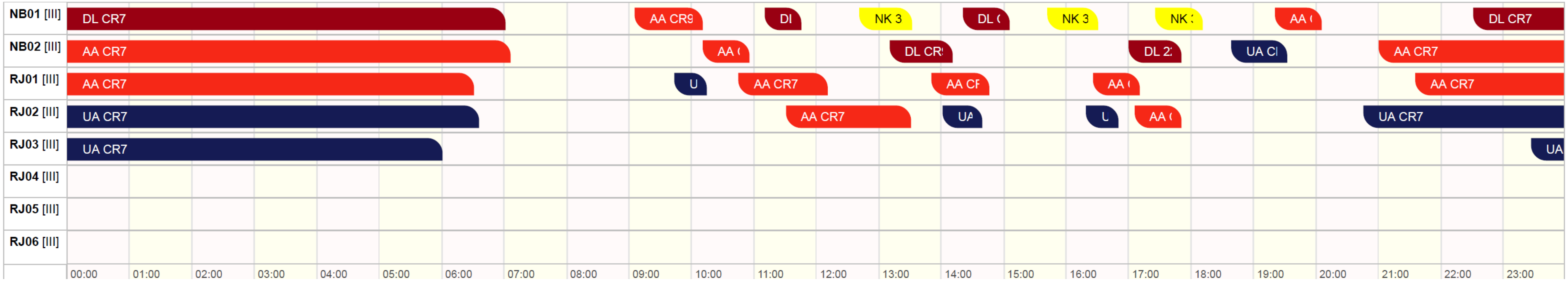
| | | BMI Bloomington, IL | CRW Charleston, WV | TRI Tri-Cities, TN | PIA Peoria, IL | ROA Roanoke, VA | CHO Charlottesville, VA | FWA Fort Wayne, IN | CAK Akron, OH | ABE Allentown, PA | CHA Chattanooga, TN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Airline Hubs | Charlotte (CLT) | | AA | Y | Y | Y | Y | Y | Y | Y | Y |
| | Atlanta (ATL) | Y | DL | Y | Y | Y | Y | Y | Y | Y | Y |
| | Chicago O'Hare (ORD) | Y | UA | | Y | Y | Y | Y | Y | Y | Y |
| | Houston (IAH) | | UA (ended 6/2019) | | Y | | | | Y | | Temp during COVID |
| | Washington-Dulles (IAD) | | UA (ended 1/2019) | | | Y | Y | | Y | Y (new 12/2020) | ended 12/2019 |
| | Washington-Reagan (DCA) | | AA | | | | | | Y | | Y |
| | Philadelphia (PHL) | | AA | | | Y | Y | Y | Y | Y | Y |
| | Dallas-Fort Worth (DFW) | Y | | Y | Y | | | Y | | | Y |
| | Detroit (DTW) | | | | Y | | | Y | Y | Y | Y |
| | New York-LaGuardia (LGA) | | | | | Y | Y | | Y | | Y |
| | Newark (EWR) | | | | | | | | Y | | Y |
| | New York-Kennedy (JFK) | | | | | | | | | | |
| | Minneapolis-St. Paul (MSP) | | | | Y | | | Y | | | |
| Leisure Markets | Myrtle Beach (MYR) | | NK (Seasonal) | | | | | | Y (new 2021) | Seasonal | |
| | Orlando (MCO) | Y | NK | | | | | | Y | | |
| | St. Petersburg (PIE) | Y | | Y | Y | Y | | Y | | Y | Y |
| | Orlando-Sanford (SFB) | Y | | Y | Y | Y | | | | Y | Y |
| | Destin (VPS) | | | | Seasonal | | | | | | |
| | Nashville (BNA) | | | | Y | | | | | Y | |
| | Phoenix-Mesa Gateway (AZA) | | | | Y | | | Y | | | |
| | Punta Gorda (PGD) | | | | Y | | | Y | | Y | |
| | Las Vegas (LAS) | | | | Y | | | | | | |
| | Tampa (TPA) | | | | | | | | Y | | |
| | Fort Myers (RSW) | | | | | | | | Seasonal | | |
| | Fort Lauderdale (FLL) | | | Y (new 2021) | | | | | | Y | |
| | Savannah (SAV) | | | | | | | | | Seasonal | |
| | Sarasota (SRQ) | | | | Y (new 2021) | | | | | Y | |

(Additional new or seasonal markets not listed = BMI-DEN, TRI-NAS and FPO, PIA-DEN, CAK-CHS and MSY)

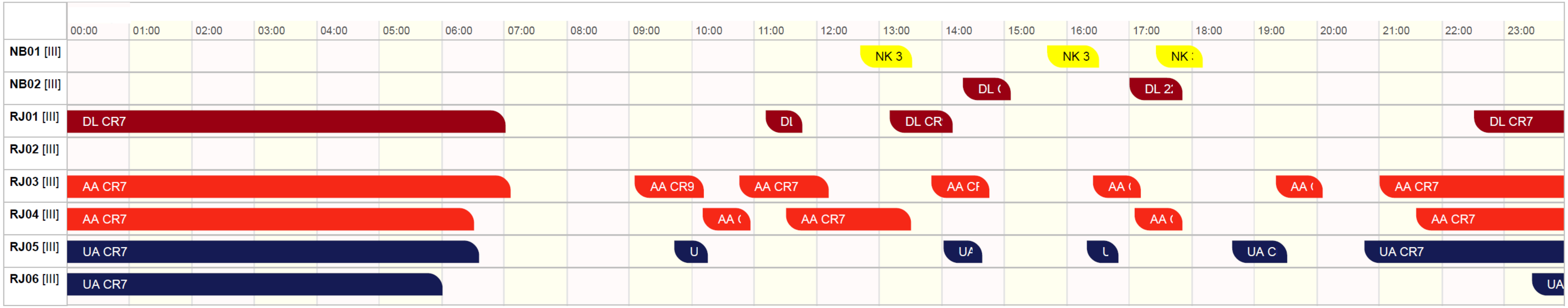
# Design Day Schedules/Gate Demand

- 2037 High Case Design Day of 48 flights requires a minimum of 5 common use or 7 preferential use gates

CRW 2037 Common Use




CRW 2037 Prefential Use



# Analysis Summary

- Depending on gate lease structures, 5 common use or 6-7 preferential use gates would be required to meet the potential range of forecasted traffic
- One additional gate for flexibility is recommended, thus future demand is estimated at **6-8** gates
- Two of the future gates should accommodate narrowbody aircraft up to the Airbus A321 for potential fleet shifting by Spirit or Delta

| CRW Gating Results | Year | Annual Passengers | Annual Commercial Ops | DD Ops | PH Ops | Common Use Gates | Preferential Use Gates |
|---|---|---|---|---|---|---|---|
| Existing Case | 2021 | 334,000 | 6,878 | 24 | 5 | 4 | 5 |
| MP Base Case | 2037 | 625,898 | 12,588 | 38 | 7 | 5 | 6 |
| MP High Case | 2037 | 707,270 | 13,665 | 48 | 7 | 5 | 7 |

- DDFS analysis assumes the 707k annual passenger traffic for 2037 could be extended to 890k passengers if the design day were less ‘peaked’ and more like an average day

# Program of Requirements

## Parameters

| Space Designation | |
|---|---|
| **Check-in** | **Domestic** |
| **Passengers** | |
| Ratio of Pax in Business/First Class | 10% |
| Ratio of Self Check Passengers (kiosks) | 40% |
| Ratio of Passengers Using Traditional Check-in Facilities | 40% |
| Ratio of Passengers Using Home Check-in (App check-in) | 20% |
| Ratio of Total Passengers Using Bag Drop | 35% |
| Additional Counters to Account for Schedule Changes | 15% |
| **Self Service Kiosks** | |
| Average Process Time per Pax (in seconds) | 80 |
| Maximum Queuing Time (in minutes) | 3 |
| Area Required per Kiosk Including Queue | 50 |
| **Bag-Drop** | |
| Average Process Time per Pax (in seconds) | 60 |
| Maximum Queuing Time (in minutes) | 5 |
| **Traditional Check-in** | |
| Average Process Time per Pax (in seconds) | 90 |
| Maximum Queuing Time (in minutes) y class | 20 |
| Maximum Queuing Time (in minutes) j class | 5 |
| Maximum Queuing Time (in minutes) f class | 5 |
| **Security** | |
| **Departure Screening** | |
| Standard | 75% |
| TSA Pre | 25% |
| % Additional Traffic (employees, crew) | 10% |
| Process (throughput) Time per Passenger at Security (in seconds) | 24 |
| Maximum Queuing Time (in minutes) | 10 |
| Support Areas as % Security Hall | 17% |

| Baggage Claim | |
|---|---|
| Average Claim Device Occupancy per Code C (in minutes) | 30 |
| Length of Bag Claim Exposure to Passengers per Code C (LF) | 150 |
| Area per Incline Type Unit for Code C | 4200 |
| **Baggage Drop-off** | |
| Area per Unit for Code C (SF) | 1650 |
| **Gate Lounges** | |
| Individual Lounges | |
| Area per Large NB | 3000 |
| Area per Small NB | 1560 |
| **Concessions** | |
| Area per Million Passengers | 8000 |
| Total Retail | 45% |
| Retail Airside | 90% |
| Retail Landside | 10% |
| Total F&B | 55% |
| F&B Airside | 90% |
| F&B Landside | 10% |
| **Concession Support** | |
| % of Total Concessions for Storage (25% -35% typical) | 10% |
| **Support** | |
| **Airline Operations** | |
| Area per EQA | 1000 |
| **Airline Ticket Offices** | |
| Area per EQA | 58 |
| **Airline Baggage Service Offices** | |
| Area per Terminating Peak Hour Passenger | 1.50 |
| **Airport Operations** | |
| Area per EQA | 600 |
| **Airport Administration** | |
| Not in Terminal | |
| **Mechanical / Electrical (as percent of Total Building)** | 10% to 12% |
| **Vertical Circulation** | 0% to 5% |
| **Miscellaneous (Two Level)** | 0% to 10% |

# Program of Requirements

## Program

| Space Designation | Existing | | 2021 | | 2037 Base | | 2037 High | |
|---|---|---|---|---|---|---|---|---|
| | Unit | SF | Unit | SF | Unit | SF | Unit | SF |
| **Airline Spaces** | | | | | | | | |
| Check-in (counter area & queue area) | | 5,074 | | | | | | |
| Full Service Check-in and Bag Drop Positions | | | 5 | 1,340 | 5 | 1,340 | 6 | 1,610 |
| Kiosks | | | 2 | 250 | 2 | 250 | 3 | 350 |
| Airline Ticketing Offices (ATO) | | 3,297 | | 290 | | 350 | | 410 |
| Outbound Baggage | | 5,263 | 3 | 15,510 | 3 | 18,090 | 4 | 20,660 |
| Transfer & Misread inputs | | | 1 | 2,400 | 1 | 2,400 | 1 | 2,400 |
| Hold Baggage Screening | | 1,938 | | | | | | |
| Level 1 Units | | | 2 | 6,000 | 2 | 6,000 | 2 | 6,000 |
| Level 2 Workstations | | | 1 | 100 | 1 | 100 | 1 | 100 |
| Level 3 EDT Stations (2 stations per 1 unit) | | | 4 | 800 | 4 | 800 | 4 | 800 |
| Ordinance Disposal | | | | 150 | | 150 | | 300 |
| Domestic Baggage Claim | | | | | | | | |
| Number of belts for NB | | | 2 | | 2 | | 2 | |
| Claim Hall area | | 3,873 | | 8,430 | | 8,440 | | 8,450 |
| Inbound Baggage Drop-off | | | | 3,300 | | 3,300 | | 3,300 |
| Baggage Service Offices | | | | 320 | | 600 | | 760 |
| Gate Departure Lounge | | 14,410 | | 7,800 | | 12,240 | | 13,800 |
| Business Class Lounges | | | 1 | 3,240 | 1 | 4,020 | 1 | 5,220 |
| Airline Operations | | 1,166 | | 5,000 | | 6,000 | | 7,000 |
| ***Airline Spaces*** | | ***35,021*** | | ***54,930*** | | ***64,080*** | | ***71,160*** |

| Space Designation | | | 2021 | | 2037 Base | | 2037 High | |
|---|---|---|---|---|---|---|---|---|
| | | | Unit | SF | Unit | SF | Unit | SF |
| **Public Spaces** | | | | | | | | |
| Check-in Lobby (circulation) | | | | 2,500 | | 2,500 | | 3,000 |
| Arrivals Greeters Hall | | | | 1,166 | | 1,859 | | 2,414 |
| Concourse Corridor (including non concourse) | | 3,486 | | 19,458 | | 24,323 | | 29,187 |
| Rest Rooms | | 3,592 | | | | | | |
| Check-in Lobby | | | | 1,350 | | 1,350 | | 1,600 |
| Concourse | | | | 1,200 | | 1,200 | | 1,200 |
| Baggage Claim | | | | 900 | | 1,350 | | 1,350 |
| Arrivals Lobby | | | | 1,400 | | 1,400 | | 1,600 |
| Passenger Security Screening | | 1,813 | | | | | | |
| Number of Screening Units - Standard | | | 1 | | 1 | | 2 | |
| Number of Screening Units - TSA Pre | | | 1 | | 1 | | 1 | |
| Security Screening Queue & Lobby | | | | 3,600 | | 3,600 | | 5,400 |
| Security Screening Support Areas | | 2,391 | | 620 | | 620 | | 920 |
| ***Public Spaces*** | | ***11,282*** | | ***32,194*** | | ***38,202*** | | ***46,671*** |

| Space Designation | | | 2021 | | 2037 Base | | 2037 High | |
|---|---|---|---|---|---|---|---|---|
| | | | Unit | SF | Unit | SF | Unit | SF |
| **Concession Space** | | 3,822 | | | | | | |
| **Domestic** | | | | | | | | |
| Retail Airside | | | | 950 | | 1,780 | | 2,300 |
| Retail Landside | | | | 110 | | 200 | | 260 |
| F&B Airside | | | | 1,160 | | 2,170 | | 2,810 |
| F&B Landside | | | | 130 | | 250 | | 320 |
| Concession Support | | 612 | | 240 | | 440 | | 570 |
| ***Concessions Spaces*** | | ***4,434*** | | ***2,590*** | | ***4,840*** | | ***6,260*** |

| Space Designation | | | 2021 | | 2037 Base | | 2037 High | |
|---|---|---|---|---|---|---|---|---|
| | | | Unit | SF | Unit | SF | Unit | SF |
| **Terminal Support Spaces** | | | | | | | | |
| Airport Operations | | 11,233 | | 3,000 | | 3,600 | | 4,200 |
| Airport Administration & Tenant Space | | 13,451 | | - | | - | | - |
| BOH Circulation (non-secure) | | 13,497 | | | | | | |
| Vertical Circulation | | 4,568 | | 1,690 | | 3,200 | | 4,060 |
| Miscellaneous (two Level) | | | | - | | - | | - |
| Mechanical / Electrical | | 5,689 | | 6,750 | | 12,790 | | 16,210 |
| ***Terminal Support Spaces*** | | ***48,438*** | | ***11,440*** | | ***19,590*** | | ***24,470*** |
| **Total Building Area** | | **99,175** | | **101,154** | | **126,712** | | **148,561** |

# Terminal Alternatives

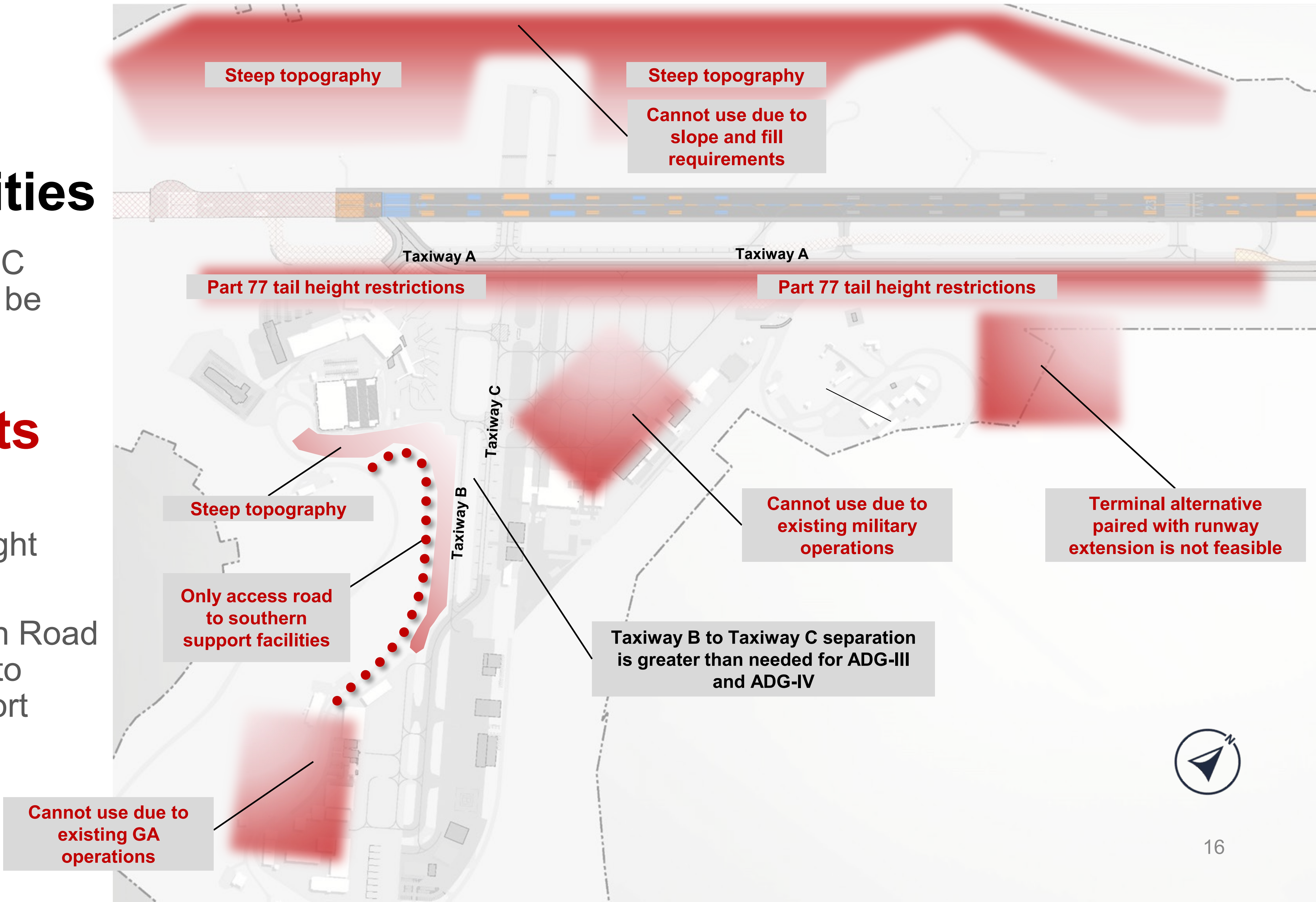
YEAGER AIRPORT

# Opportunities

- Taxiway B and C separation can be reduced

# Constraints

- Topography
- Part 77 tail height restrictions
- Eagle Mountain Road is only access to southern support facilities



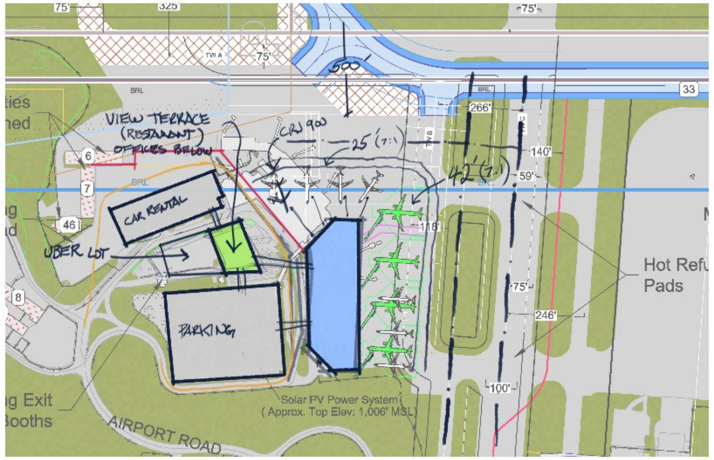
# Approach to Terminal Site Selection


Within the existing terminal area

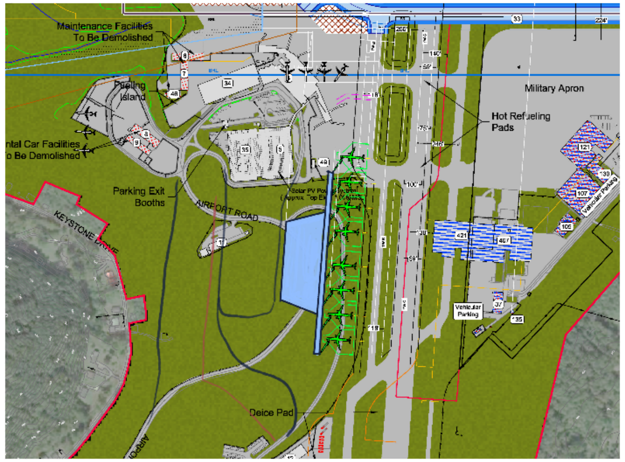
Outside the existing terminal area

- The focus of this effort is to explore alternatives within the existing terminal area
- All locations outside of the existing terminal area are likely not feasible due to cost and construction duration

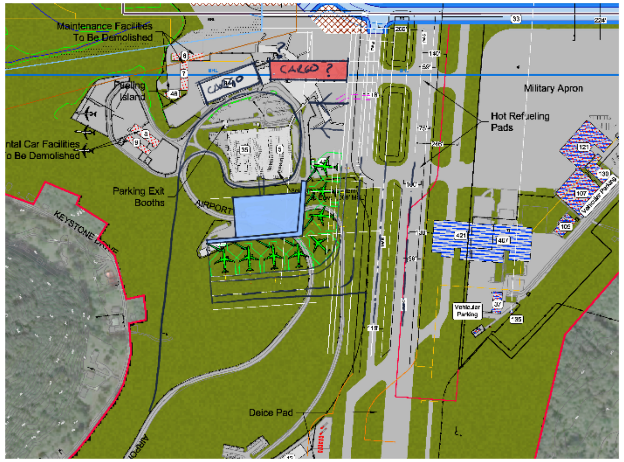
# Terminal Alternatives Within Existing Terminal Area



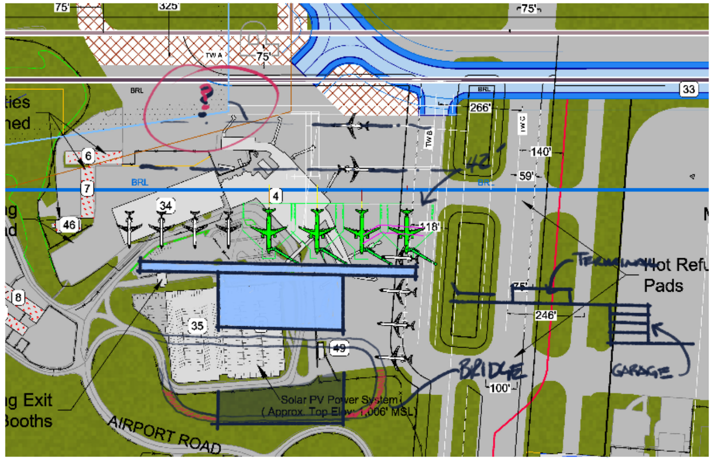
Alternative 1



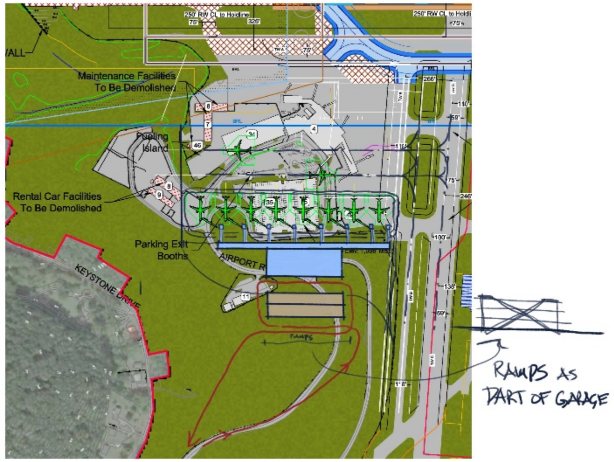
Alternative 2



Alternative 3

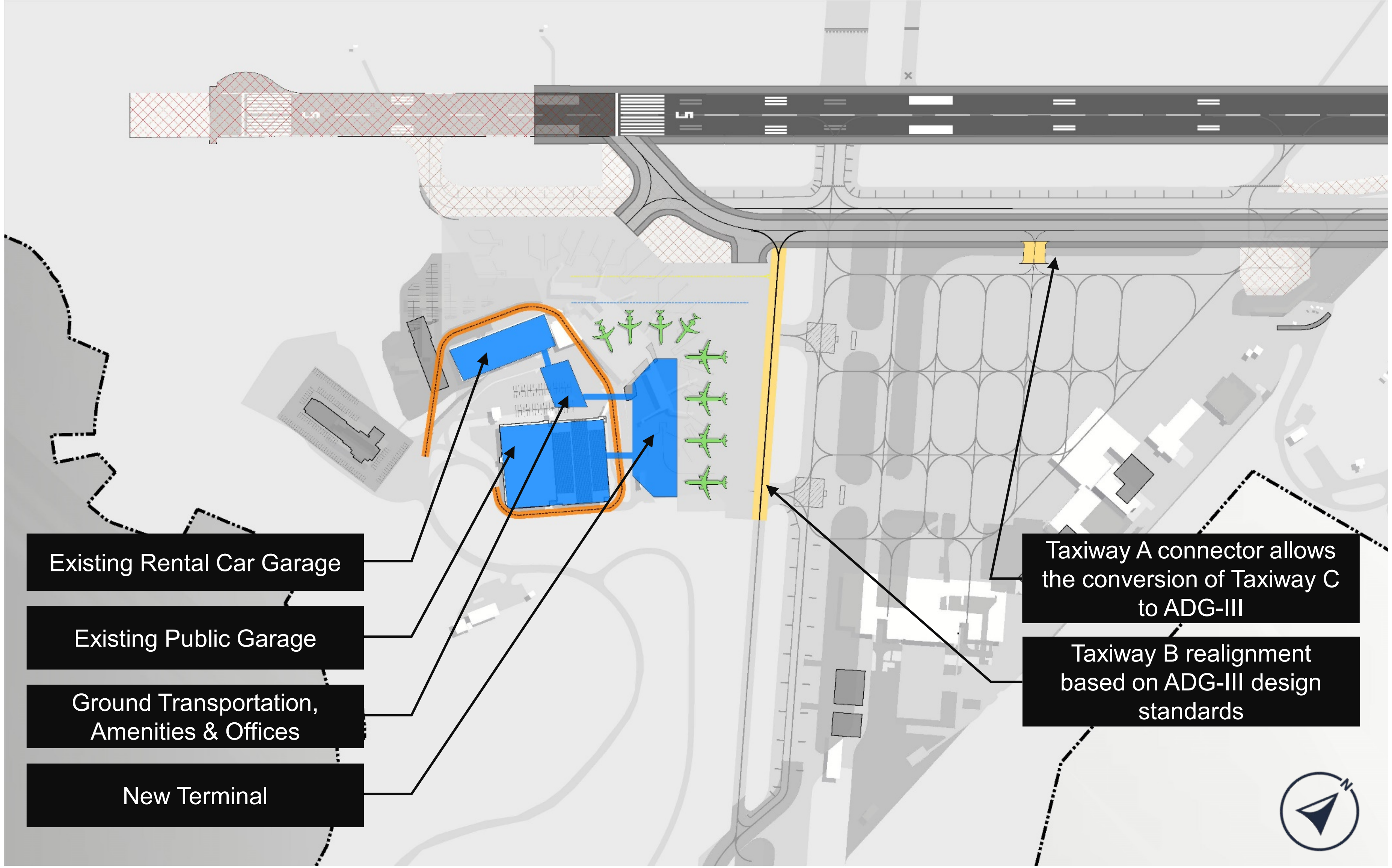


Alternative 4



Alternative 5

# Alternative 1



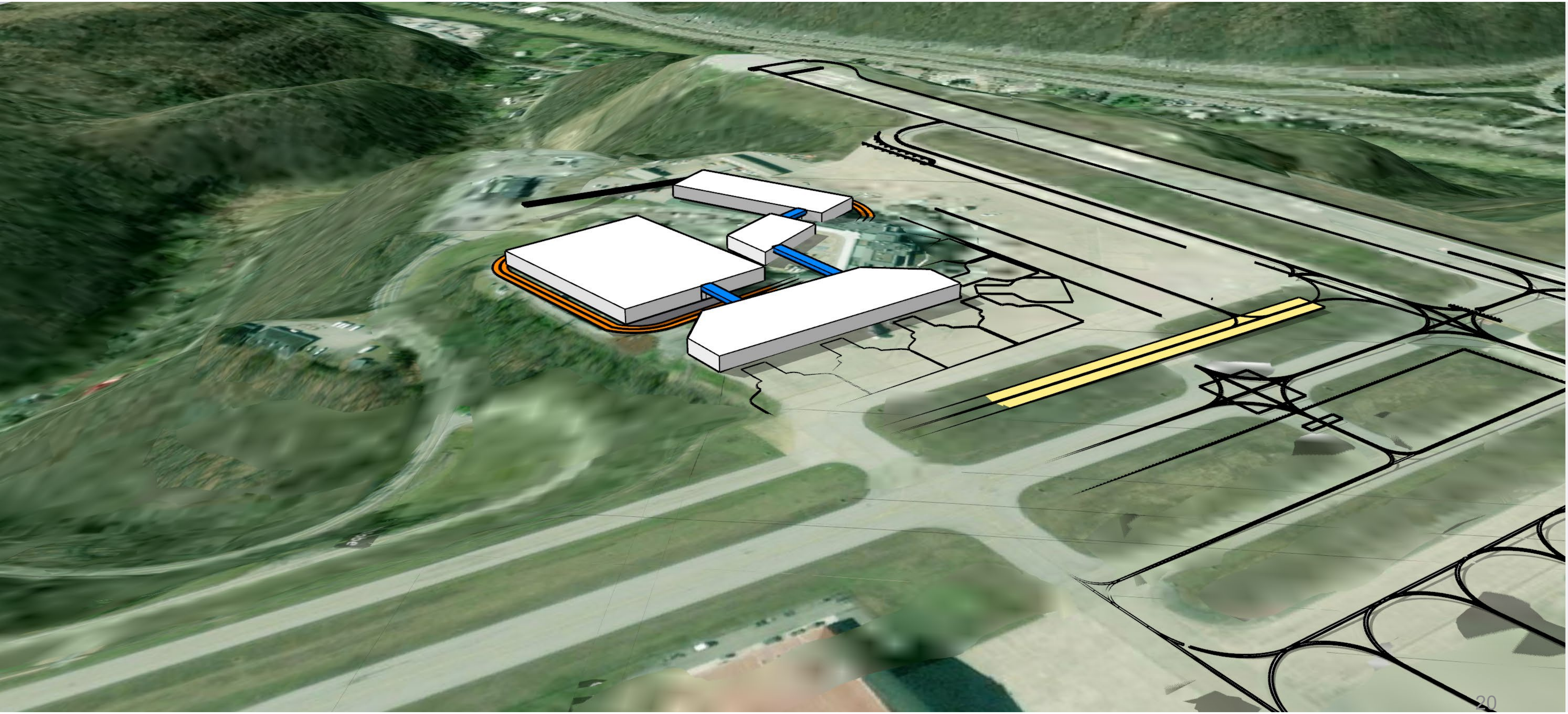

Pros:

- No fill required
- Minimal terminal operation disruption
- Works with existing parking structures
- Lowest CAPEX

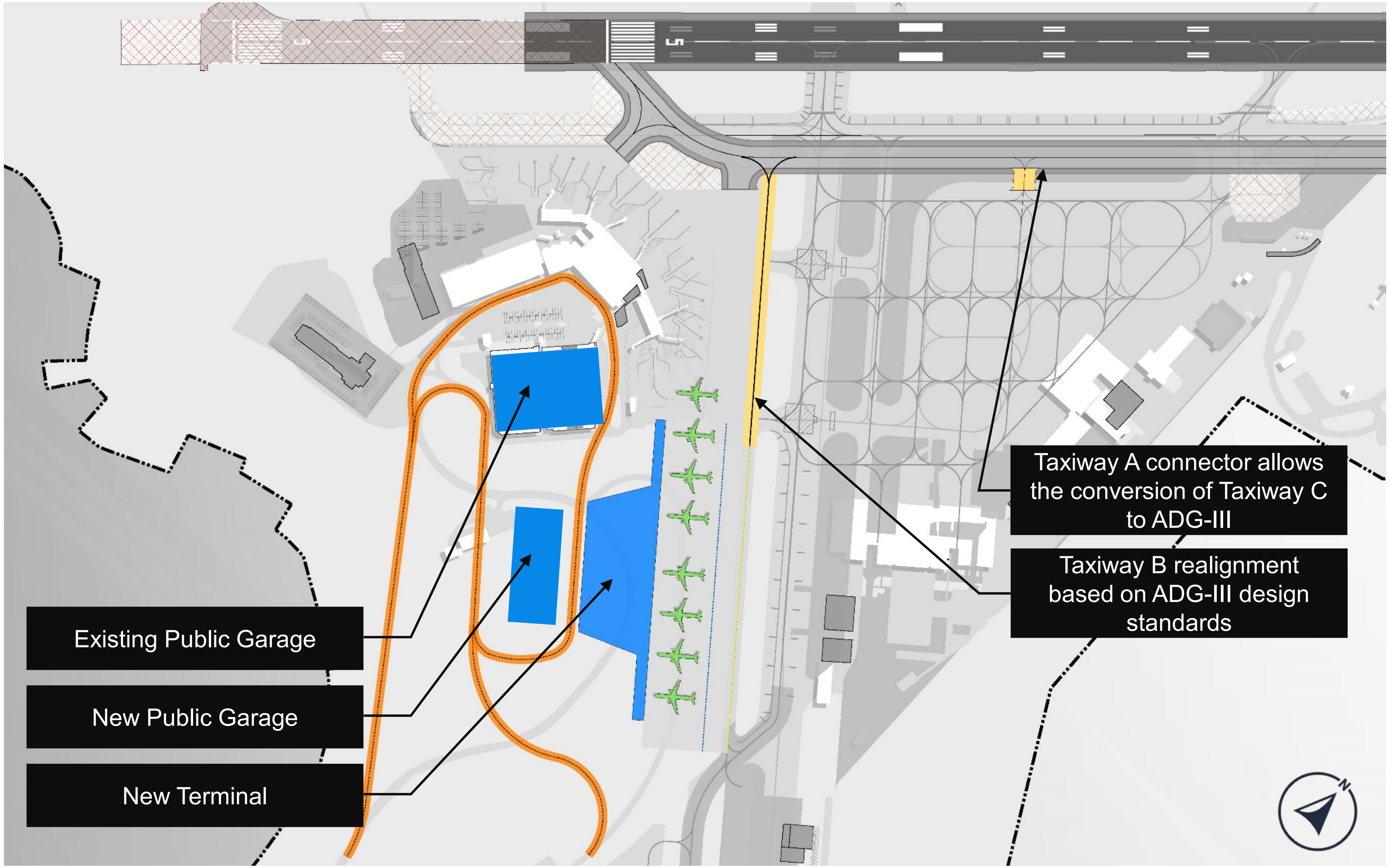
Cons:

- Requires modifications to Taxiway B
- Disruption to existing gate operation

# Alternative 1



# Alternative 2



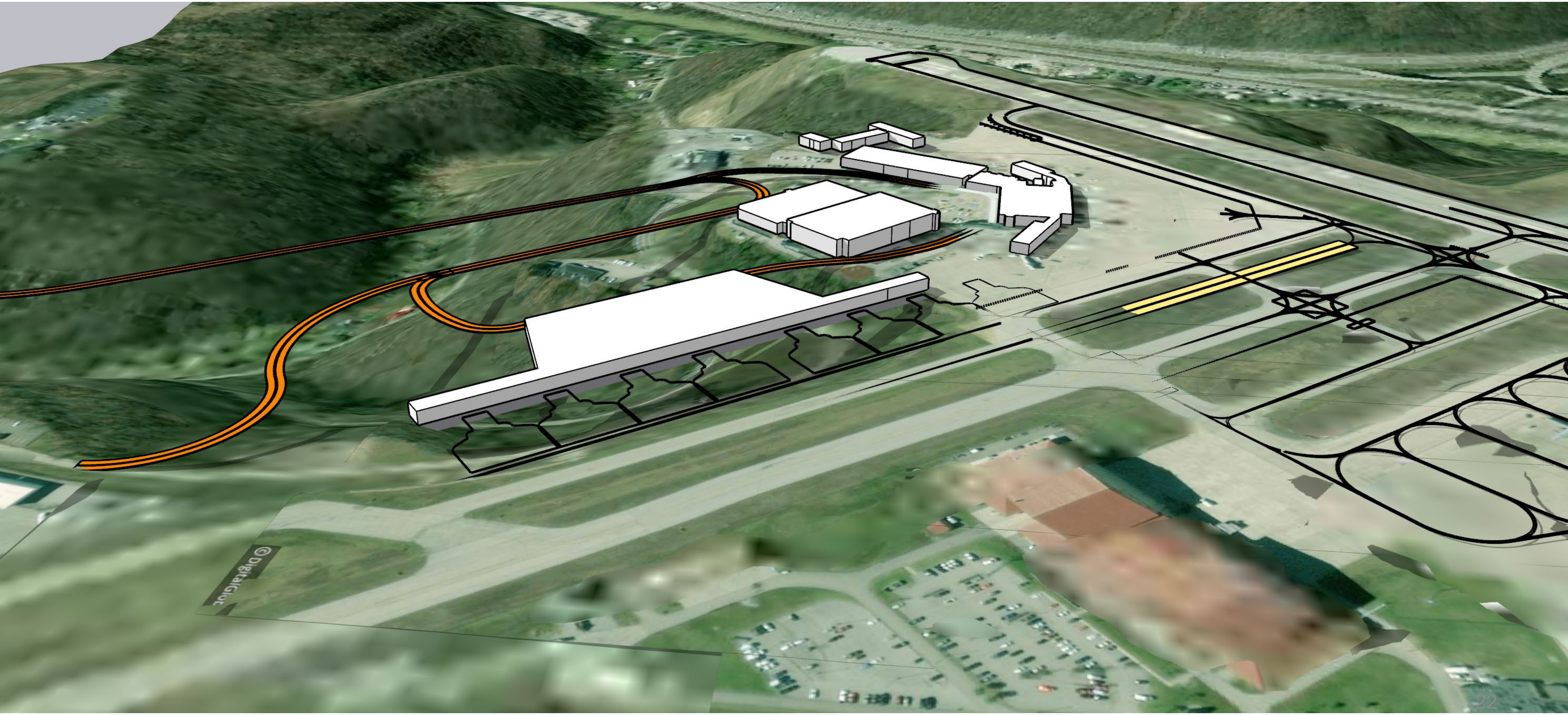

Pros:

- Existing site available for other uses
- Minimal disruption to existing operations
- Reuses public parking garage (rentals & long term)

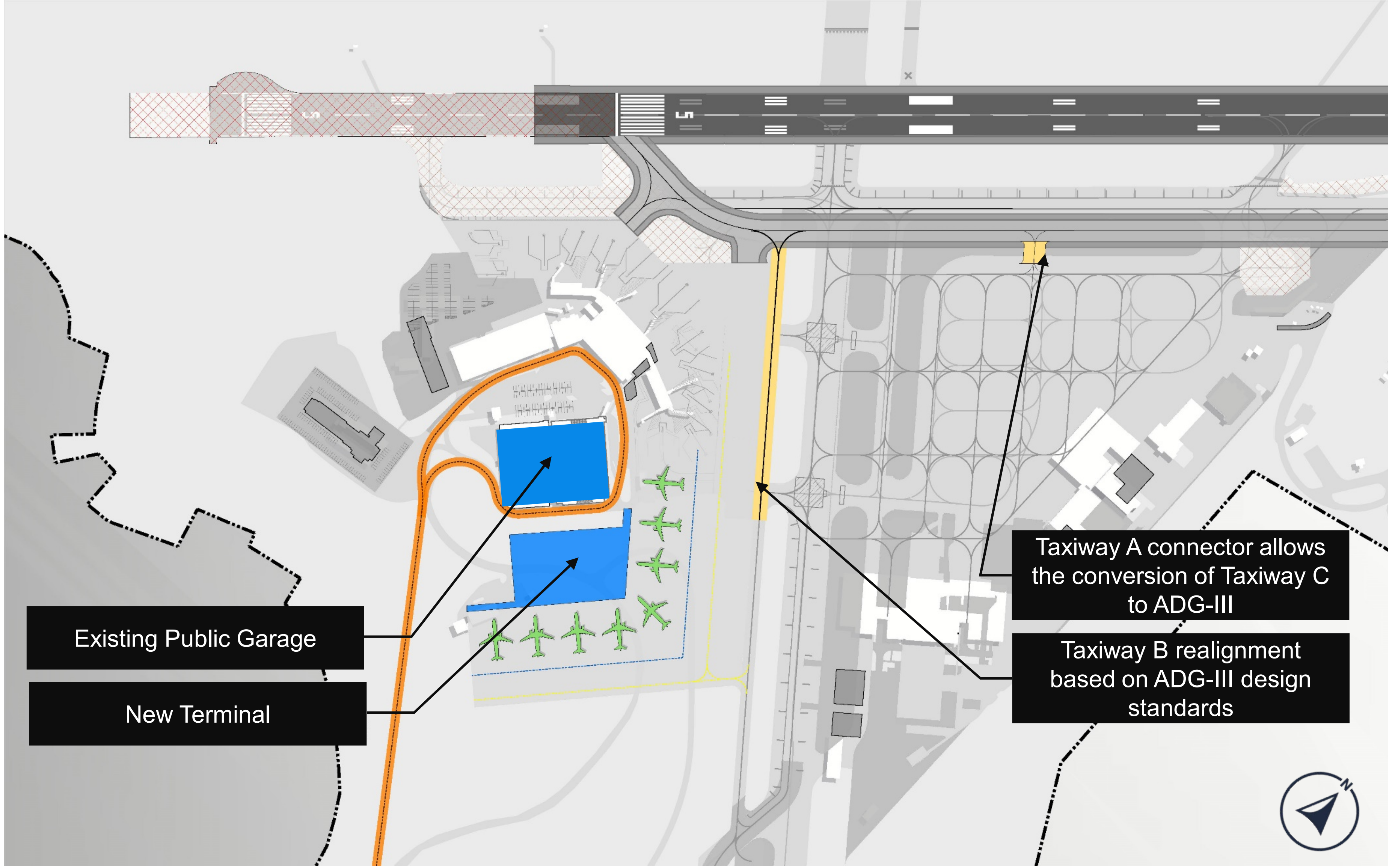
Cons:

- Existing garage proximity to terminal
- Requires new garage
- Fill required
- High CAPEX
- Requires modifications to Taxiway B

# Alternative 2



# Alternative 3



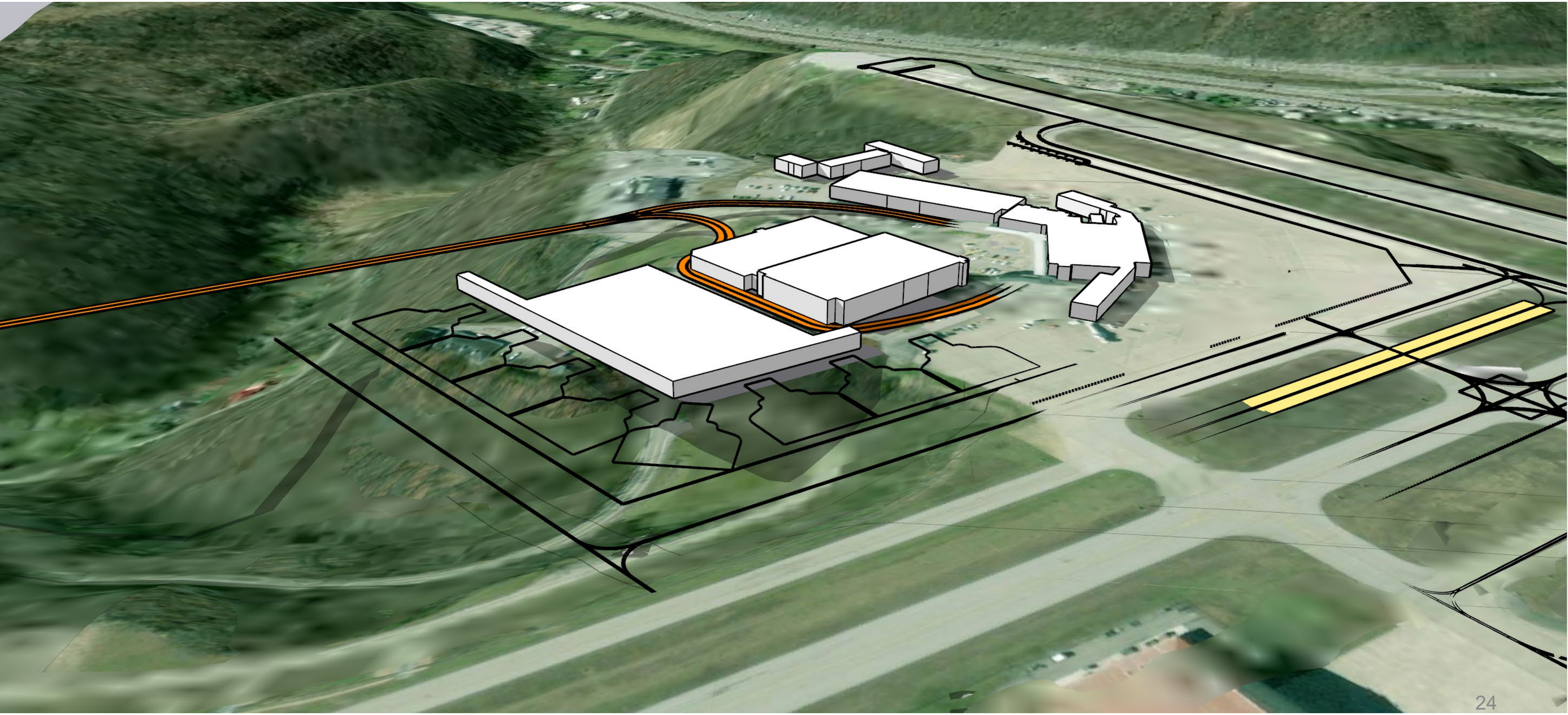

Pros:

- Existing site available for other uses
- Minimal disruption to existing operations
- Reuses public parking garage

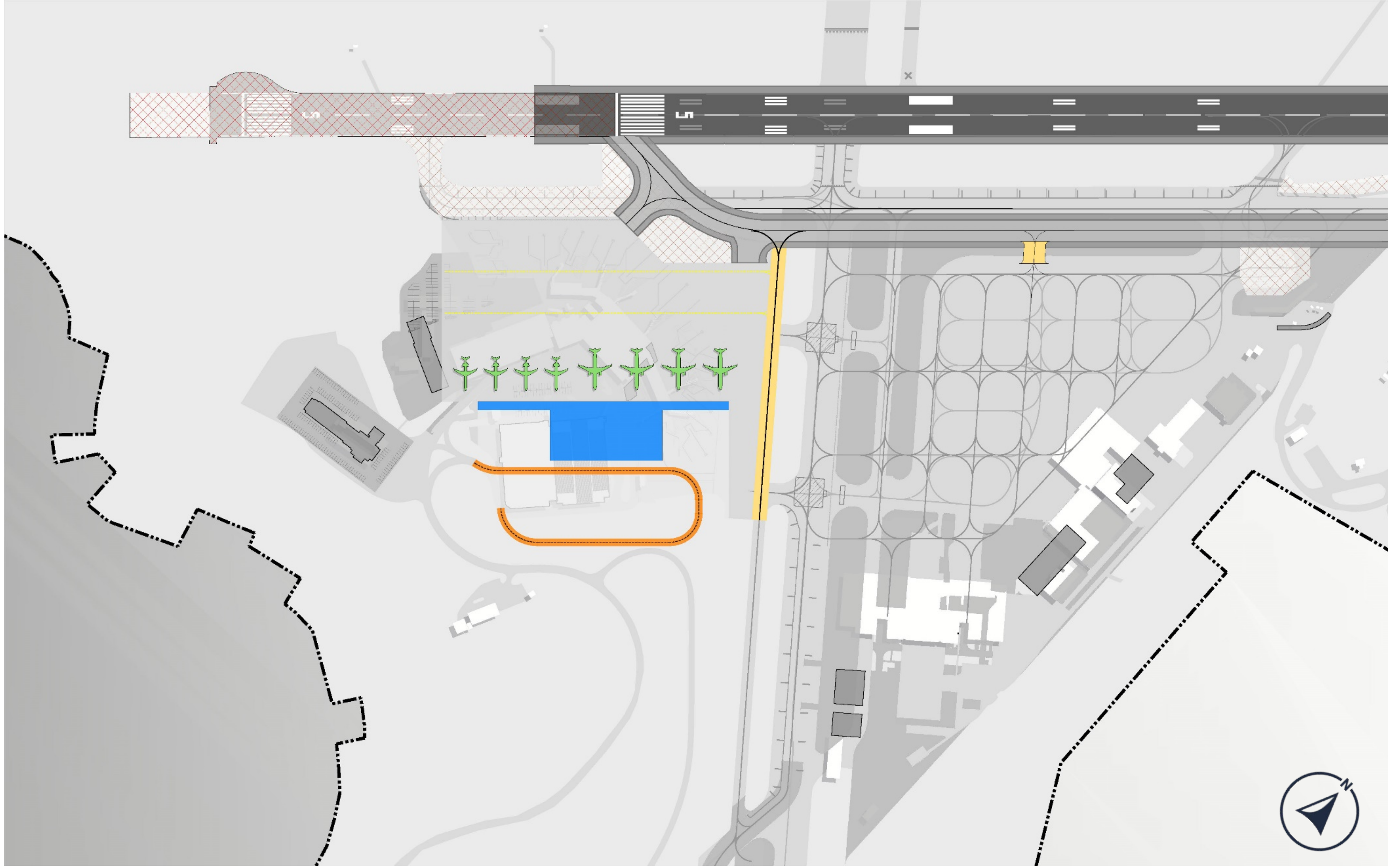
Cons:

- Fill required
- High CAPEX
- Requires modifications to Taxiway B

# Alternative 3



# Alternative 4



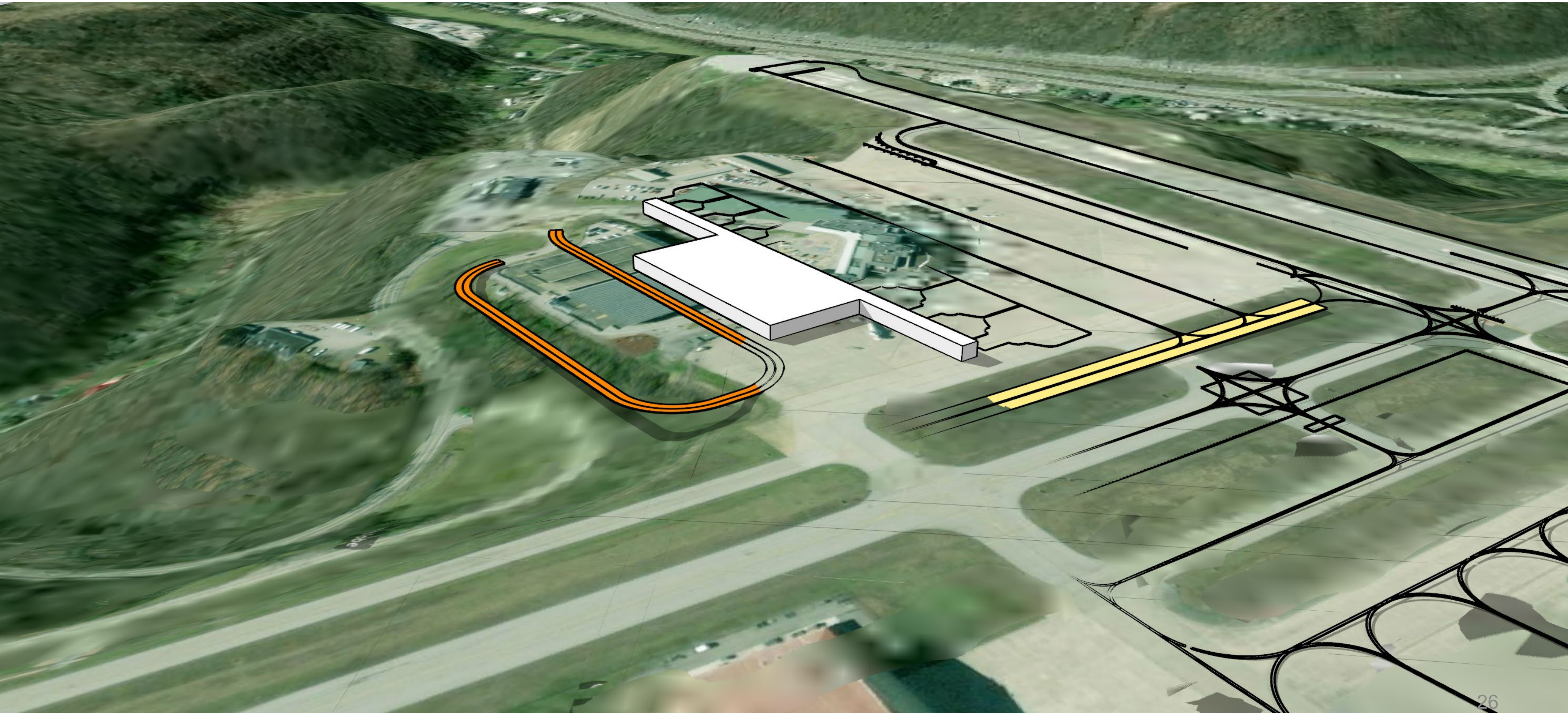
Pros:

- Minimal fill requirement
- Good airside operation

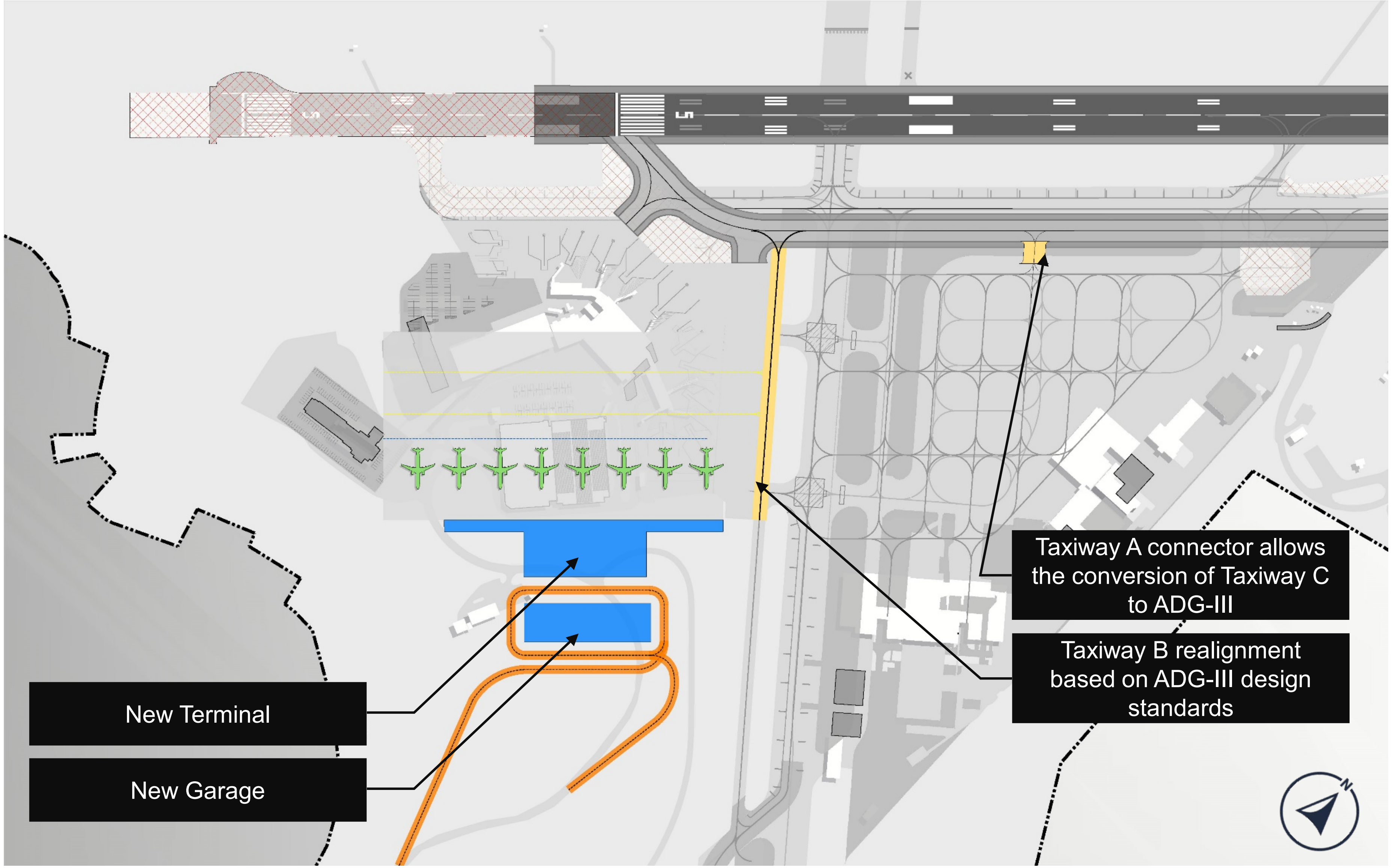
Cons:

- Does not maintain any existing facilities
- Requires modifications to Taxiway B
- Constructability difficult with major operations disruption

# Alternative 4



# Alternative 5



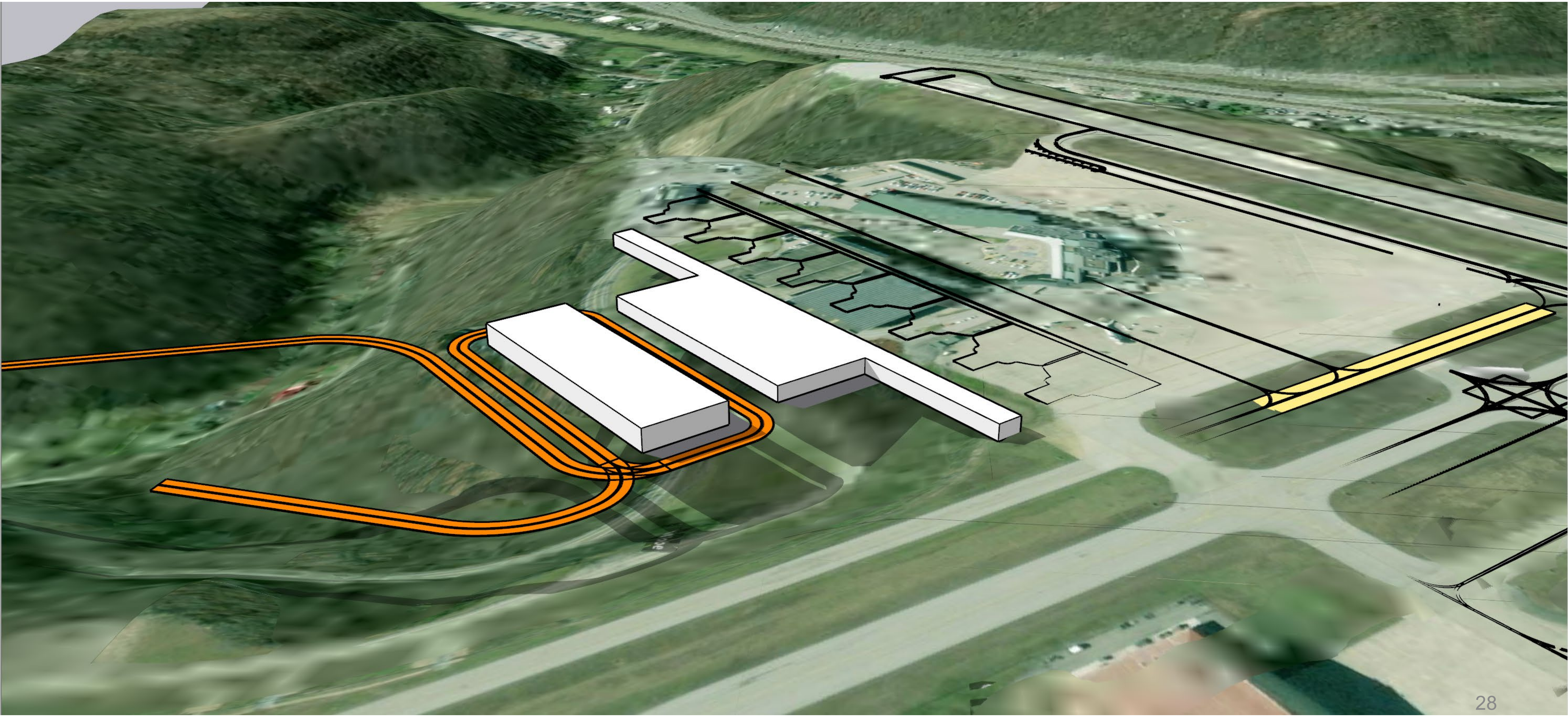

Pros:

- Good airside operations (dual taxilane)

Cons:

- Does not maintain any existing facilities
- Requires modifications to Taxiway B
- Fill required
- High CAPEX

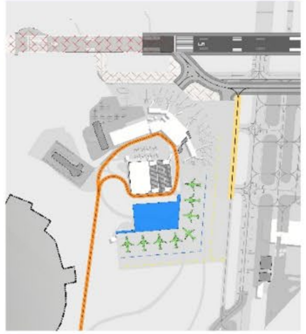
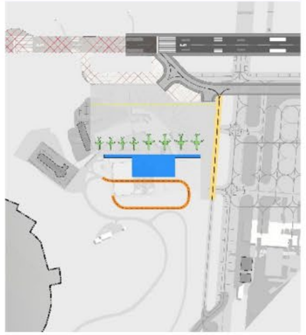
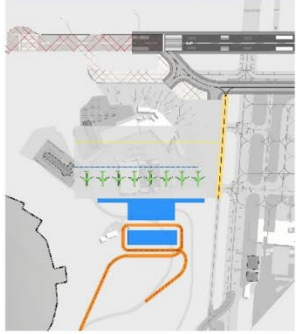
# Alternative 5



# Terminal Alternatives Outside Existing Terminal Area

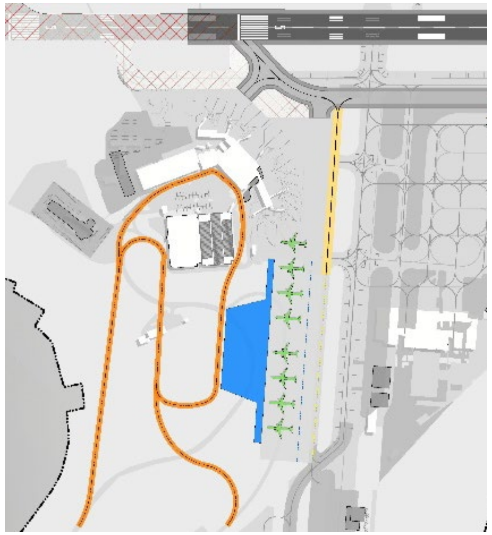
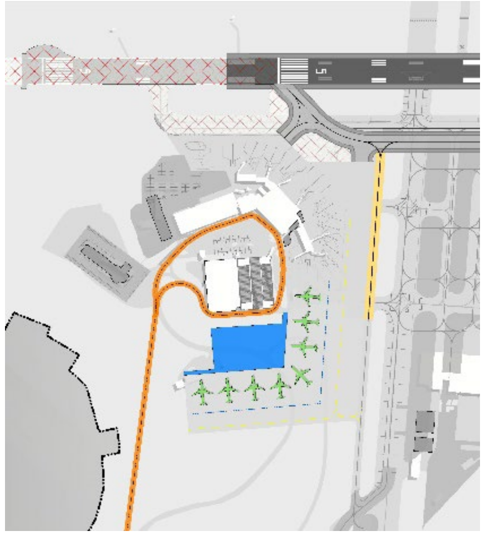
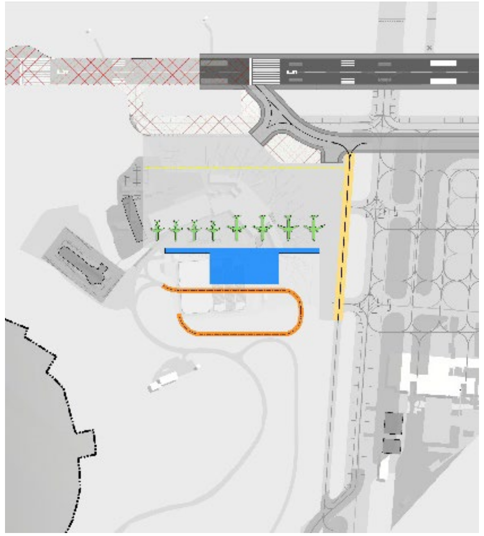
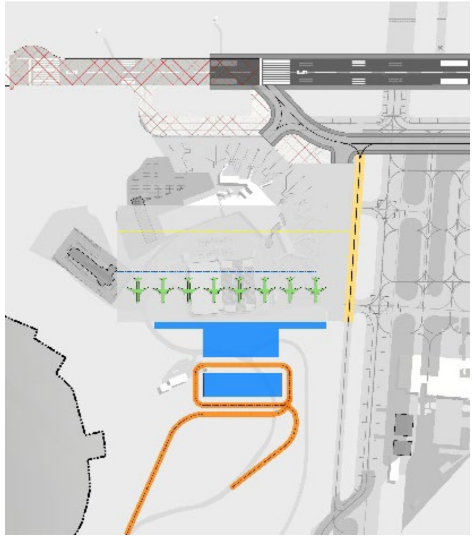

- Multiple terminal sites outside of the existing terminal area were considered
- All potential sites share a common terminal configuration
- All locations outside of the existing terminal area are likely not feasible due to cost, phasing, construction duration or impact to existing operations

# Evaluation Matrix

| Evaluation Alternatives / Criteria | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| Fill Requirement | Excellent | Average | Average | Good | Poor |
| Use of Existing Structures | Excellent | Average | Good | Poor | Poor |
| Apron / Taxilane Configuration | Average | Poor | Good | Excellent | Excellent |
| Expandability | Excellent | Excellent | Good | Poor | Poor |
| Phasing / Impact to Operations | Good | Excellent | Excellent | Poor | Poor |
| Access Road Impacts | Excellent | Good | Good | Average | Poor |

- Excellent (green)
- Good (blue)
- Average (orange)
- Poor (red)

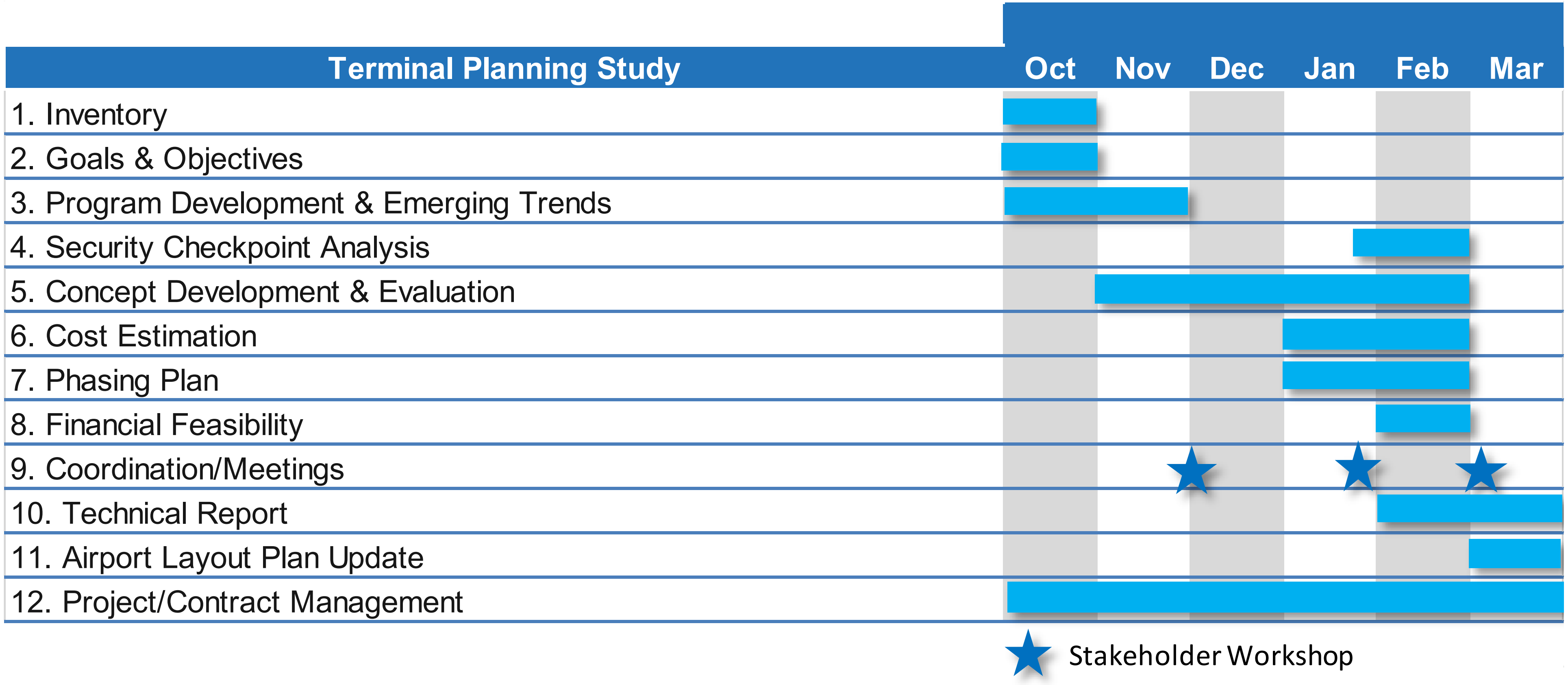
# Alternative Overview

| Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 |
|---|---|---|---|---|
|  |  |  |  |  |

# Next Steps

# Next Steps

- Select a preferred alternative
- Refine terminal and airside layouts
- Develop additional interior/exterior renderings



# TO 1401 – Terminal Planning Study
## Workshop 2

Landrum & Brown | February 3, 2022

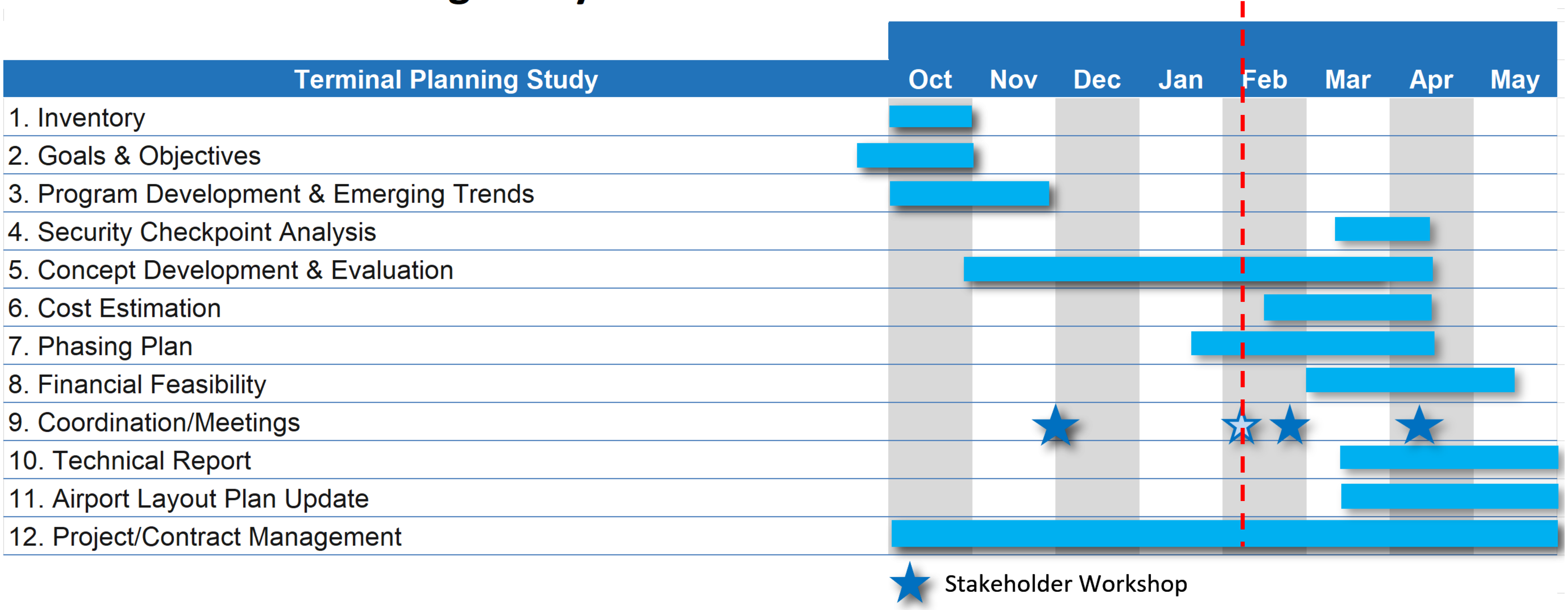
YEAGER AIRPORT

# Agenda

- Project Schedule
- Forecast & Gate Requirement Overview
- Terminal Site Selection
- Site Analysis
- Terminal Space Program
- Terminal Layout Refinement
- Next Steps

# Project Schedule

## CRW Terminal Planning Study



# Forecast & Gate Requirement Overview

# Analysis Summary

- Depending on gate lease structures, 5 common use or 6-7 preferential use gates would be required to meet the potential range of forecasted traffic
- One additional gate for flexibility is recommended, thus future demand is estimated at **6-8** gates
- Two of the future gates should accommodate narrowbody aircraft up to the Airbus A321 for potential fleet shifting by Spirit or Delta

| CRW Gating Results | Year | Annual Passengers | Annual Commercial Ops | DD Ops | PH Ops | Common Use Gates | Preferential Use Gates |
|---|---|---|---|---|---|---|---|
| Existing Case | 2021 | 334,000 | 6,878 | 24 | 5 | 4 | 5 |
| MP Base Case | 2037 | 625,898 | 12,588 | 38 | 7 | 5 | 6 |
| MP High Case | 2037 | 707,270 | 13,665 | 48 | 7 | 5 | 7 |

- DDFS analysis assumes the 707k annual passenger traffic for 2037 could be extended to 890k passengers if the design day were less ‘peaked’ and more like an average day

# Terminal Site Selection

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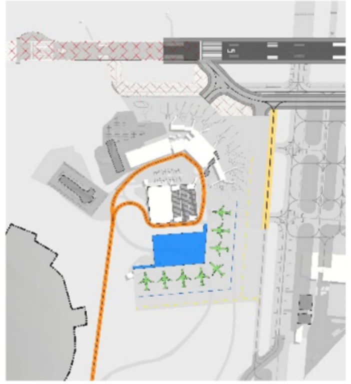
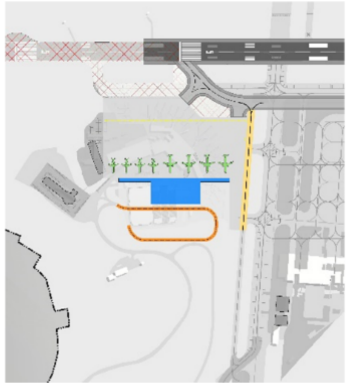
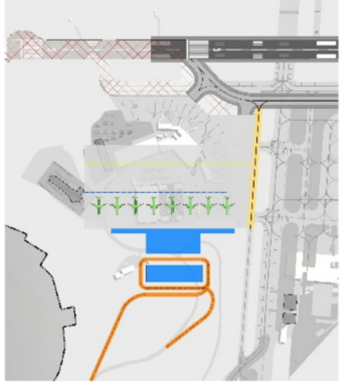
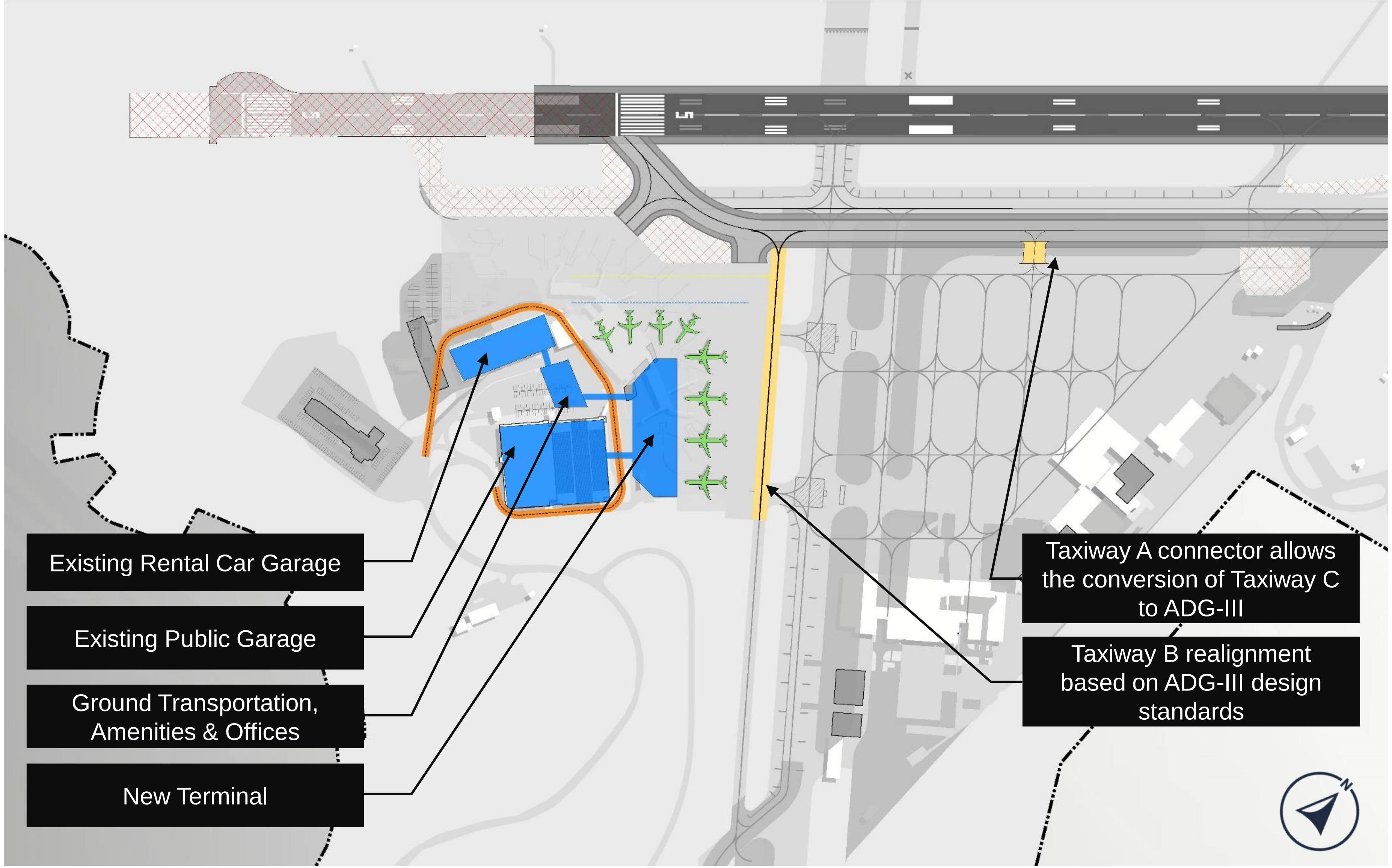
# Evaluation Matrix *(December 2, 2021)*

| Evaluation Alternatives / Criteria | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| Fill Requirement | Excellent | Average | Average | Good | Poor |
| Use of Existing Structures | Excellent | Average | Good | Poor | Poor |
| Apron / Taxilane Configuration | Average | Poor | Good | Excellent | Excellent |
| Expandability | Excellent | Excellent | Good | Poor | Poor |
| Phasing / Impact to Operations | Good | Excellent | Excellent | Poor | Poor |
| Access Road Impacts | Excellent | Good | Good | Average | Poor |

- Excellent
- Good
- Average
- Poor

✓

# **Alternative 1** *(December 2, 2021)*




Pros:

- Minimal or no fill required
- Minimal terminal operation disruption
- Works with existing parking structures
- Lowest CAPEX

Cons:

- Requires modifications to Taxiway B
- Disruption to existing gate operation

# Site Analysis

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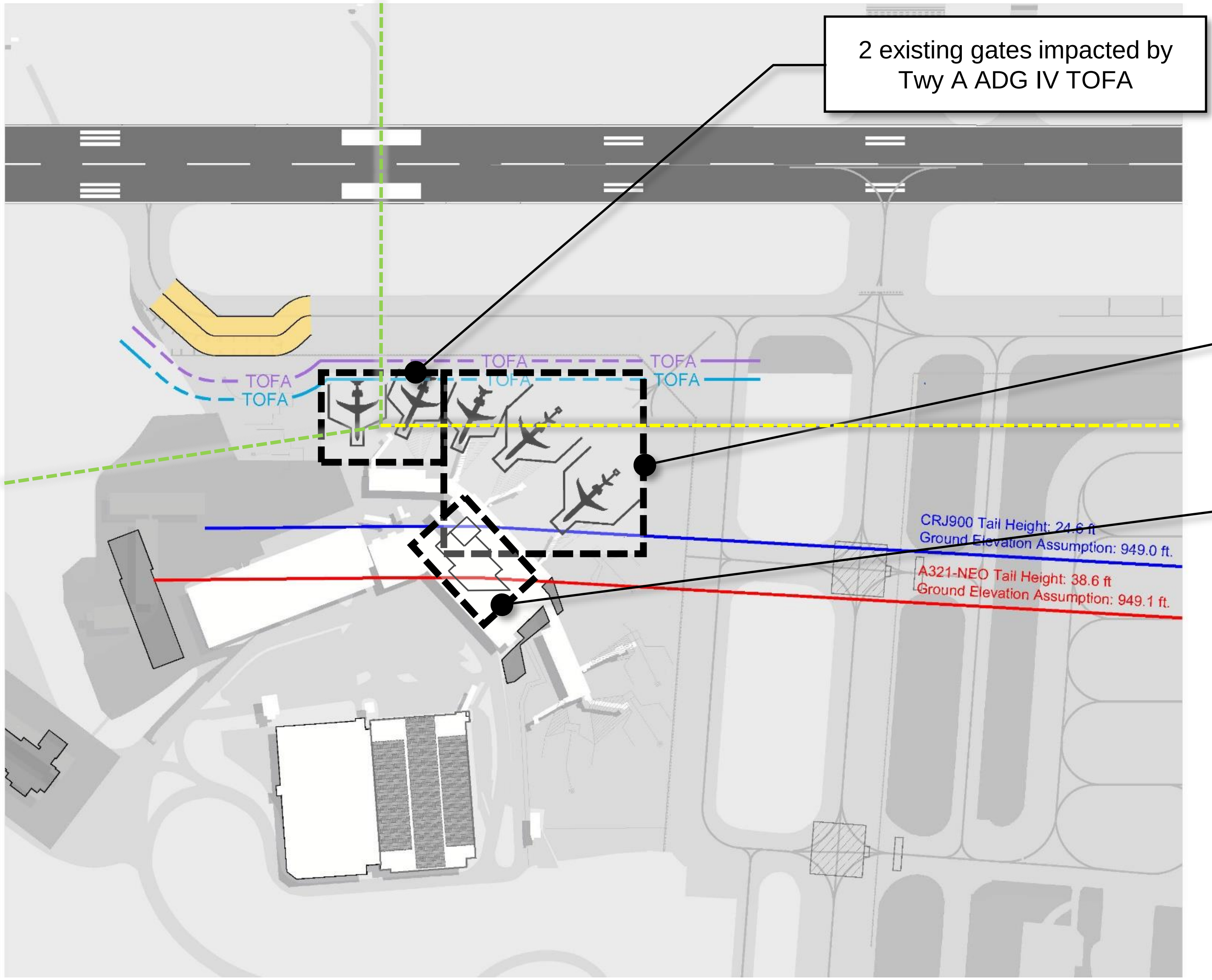
# Existing/Planned Condition

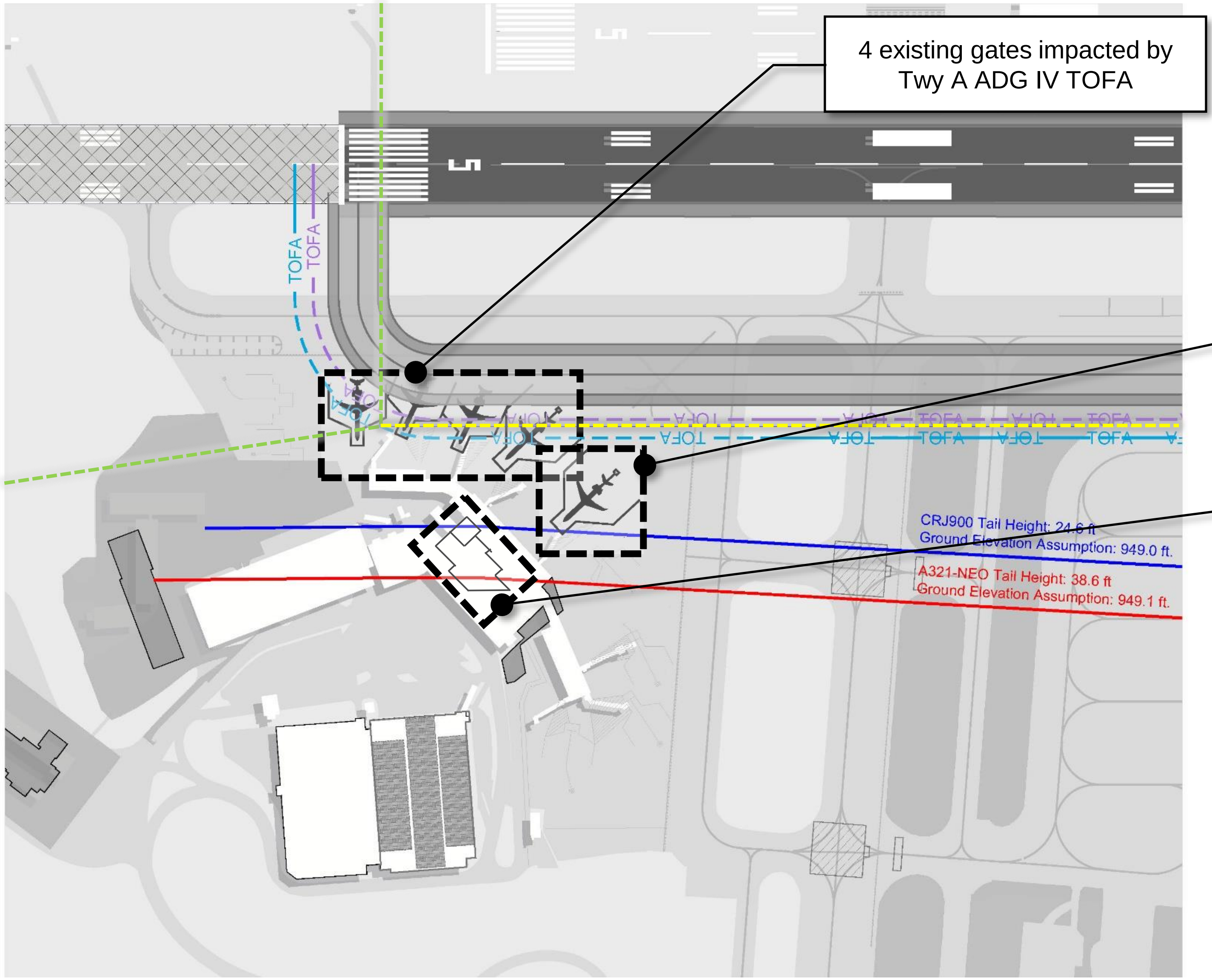



- Existing terminal
- Existing runway end
- Existing Taxiway A with short-term fix

Legend

- ADG III TOFA
- ADG IV TOFA
- CRJ-900 Tail Height Limit
- A321-NEO Tail Height Limit
- Part 77 Approach Surface
- Part 77 Primary Surface

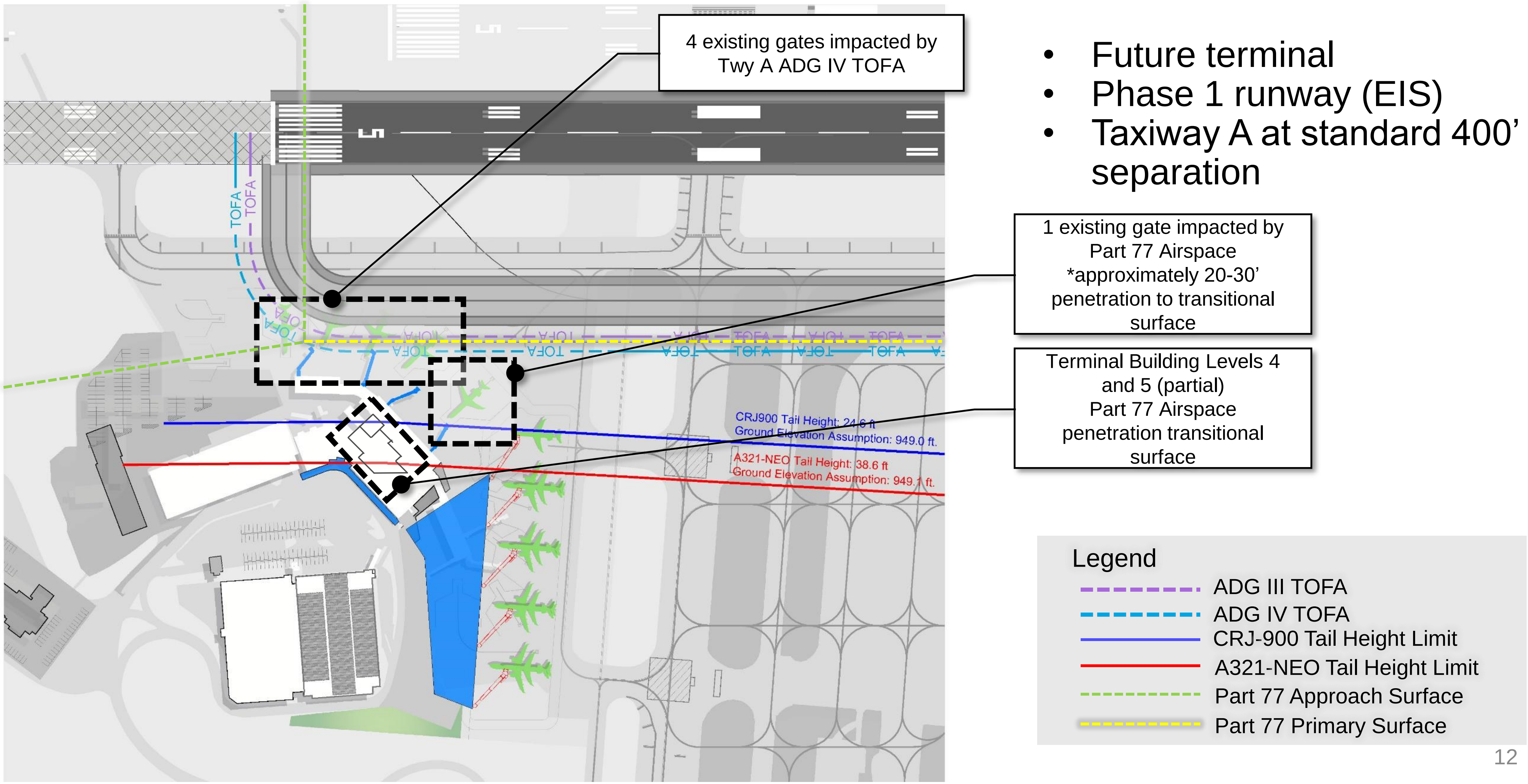
# Phase 1 Airfield




- Existing terminal
- Phase 1 runway (EIS)
- Taxiway A at standard 400' separation

Legend
- ADG III TOFA
- ADG IV TOFA
- CRJ-900 Tail Height Limit
- A321-NEO Tail Height Limit
- Part 77 Approach Surface
- Part 77 Primary Surface

# Future Terminal

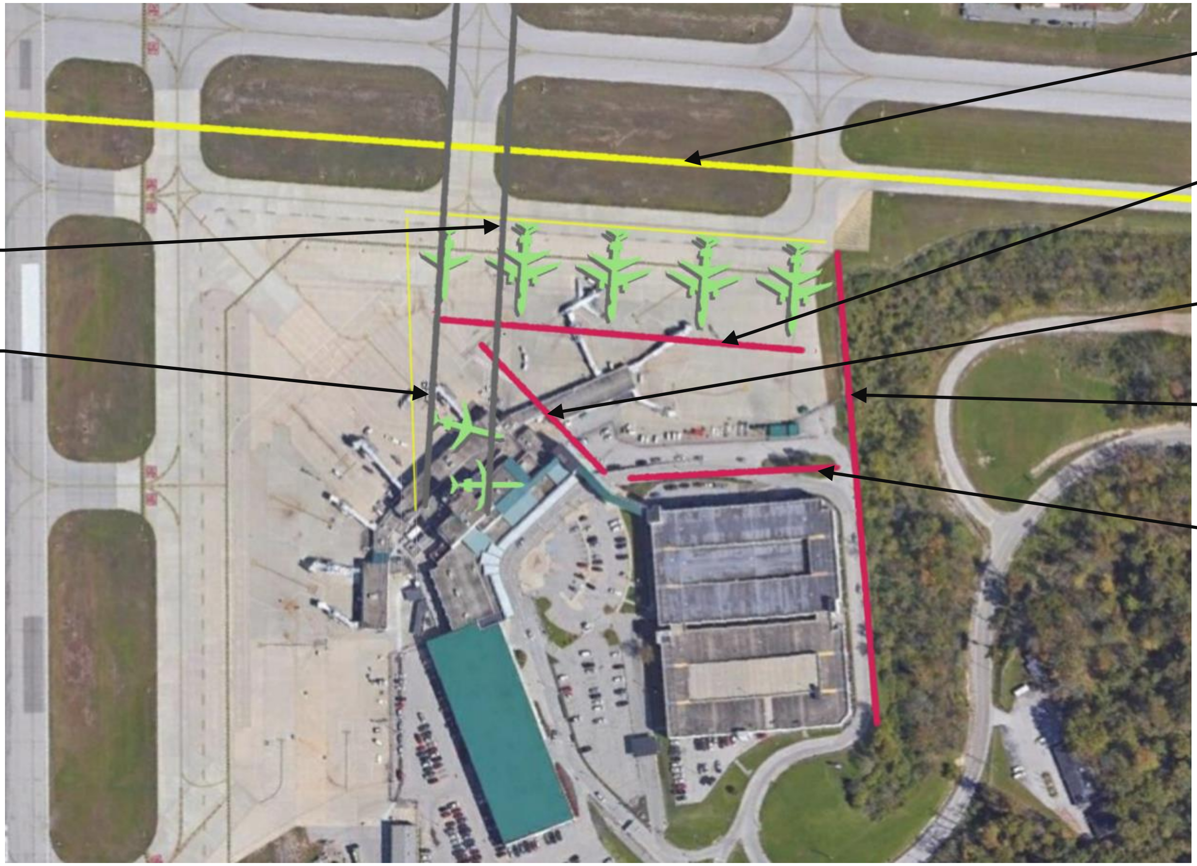



- Future terminal
- Phase 1 runway (EIS)
- Taxiway A at standard 400' separation

# New Building and Aircraft Limits

A321-NEO Tail Height 38'-6"
Part 77 Height Limitation

CRJ900 Tail Height 24'-6"
Part 77 Height Limitation



New Taxiway

Building Limit
Minimum Distance from Taxiway

Building Limit
Existing Building (Phasing)

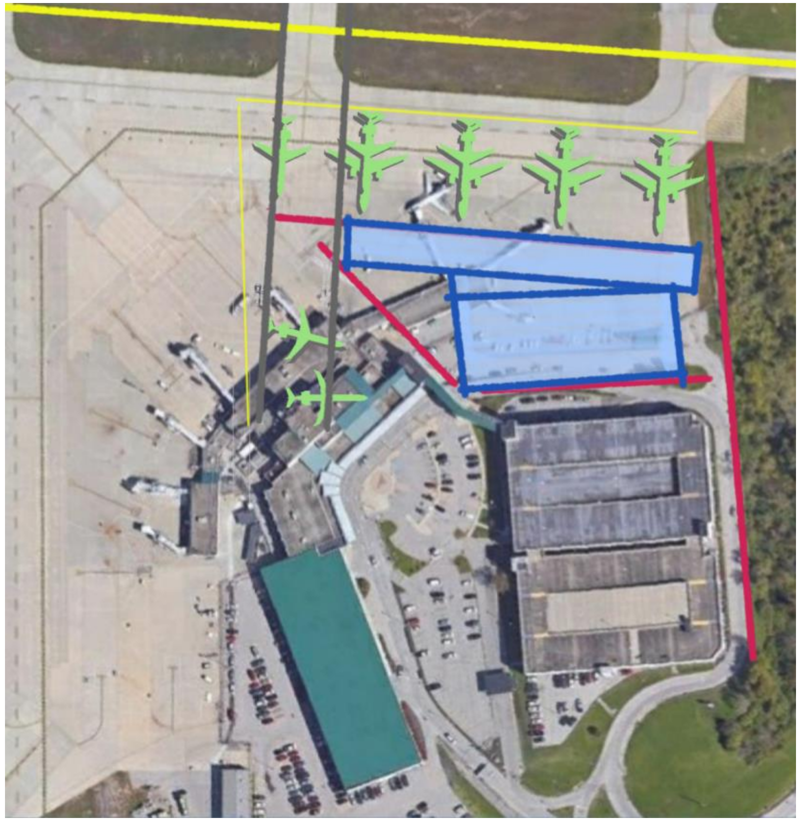
80' drop from apron to road

Building Limit
Minimum Distance to Garage

# New Building Concepts

Maximum Envelope

Simple Rectangle

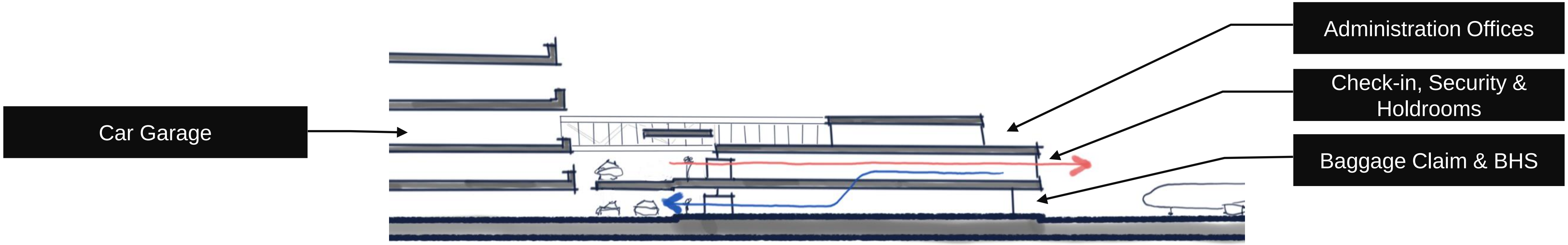


Hybrid

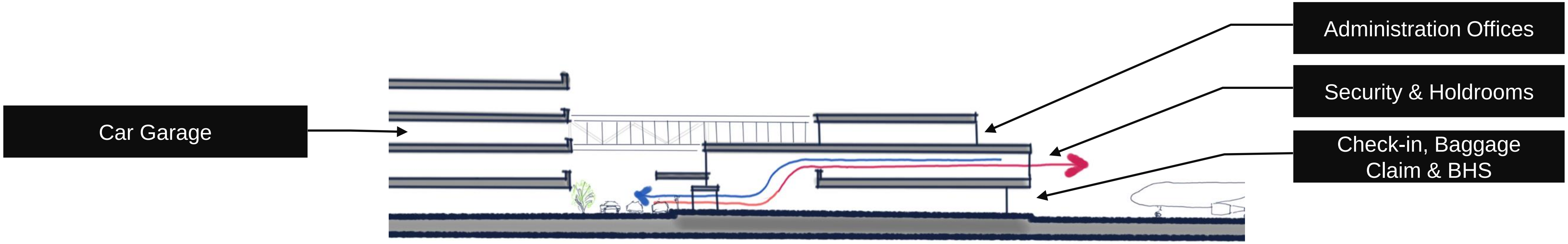
# Site

# Site

# Curb Alternatives

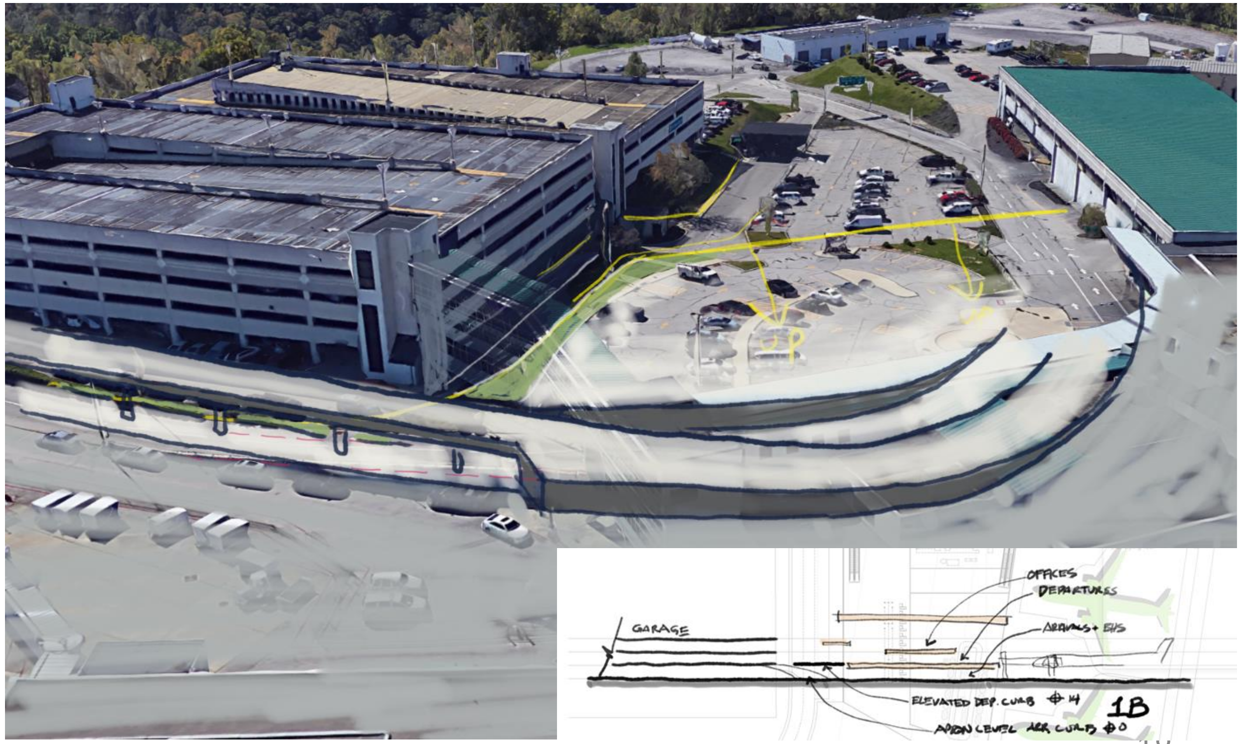



Two Level Curb




One Level Curb

# Two Level Curb Sketch



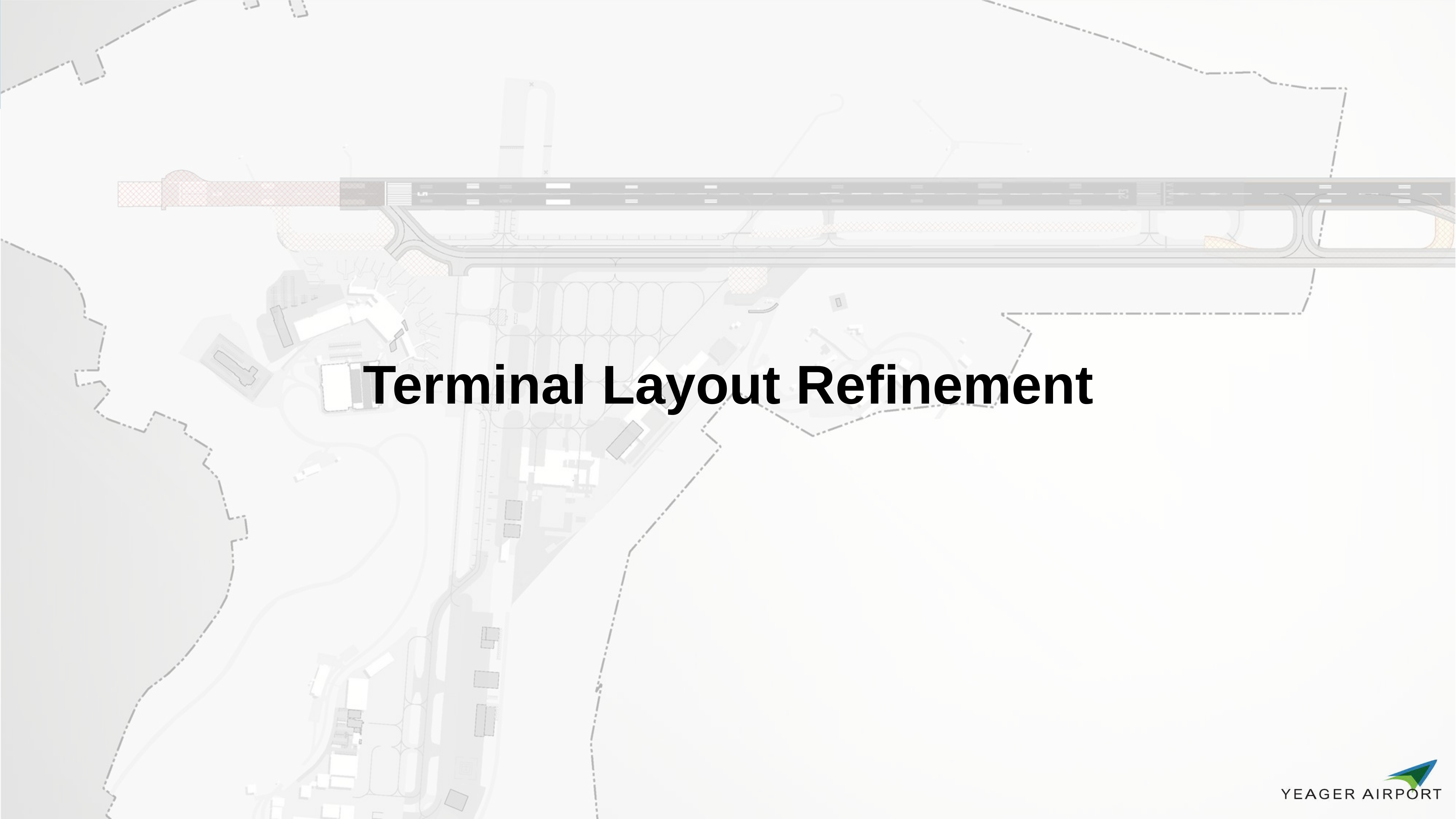
# Terminal Space Program

# Area Summary

| Space Designation | Existing | | Program 2037 High | |
|---|---|---|---|---|
| | Unit | SF | Unit | SF |
| Check-in | 16 | 5,074 | 12 | 4,010 |
| Airline Offices | | 3,297 | | 1,050 |
| Baggage Make-up / Drop-off | | 5,263 | | 26,360 |
| CBIS/CBRA Checked Bag Screening | | 1,938 | | 7,200 |
| Baggage Claim | 1 | 3,873 | | 8,450 |
| Holdrooms | | 14,410 | | 13,800 |
| Business Lounge | | | | 5,220 |
| Airline Operations | | 1,166 | | 7,760 |
| Non-Secure Circulation / Lobbies | | 13,497 | | 8,414 |
| Secured Circulation | | 3,486 | | 29,187 |
| Restrooms | | 3,592 | | 5,750 |
| Security Screening Check Point | 2 | 1,813 | 2 | 5,400 |
| TSA Offices | | 2,391 | | 920 |
| Concessions | | 4,434 | | 6,260 |
| Airport Operations / Administration | | 11,233 | | 11,733 |
| Tenant Spaces | | 13,451 | | |
| Vertical Circulation | | 4,568 | | 4,060 |
| MEP/Support | | 5,689 | | 16,210 |
| Loading Dock | | | | 750 |
| **Total Areas** | | **99,175** | | **162,534** |
| Terrace | | | | |

- Program based on 7 preferential use gates.

| CRW Gating Results | Preferential Use Gates |
|---|---|
| Existing Case | 5 |
| MP Base Case | 6 |
| MP High Case | 7 |



# Terminal Layout Refinement

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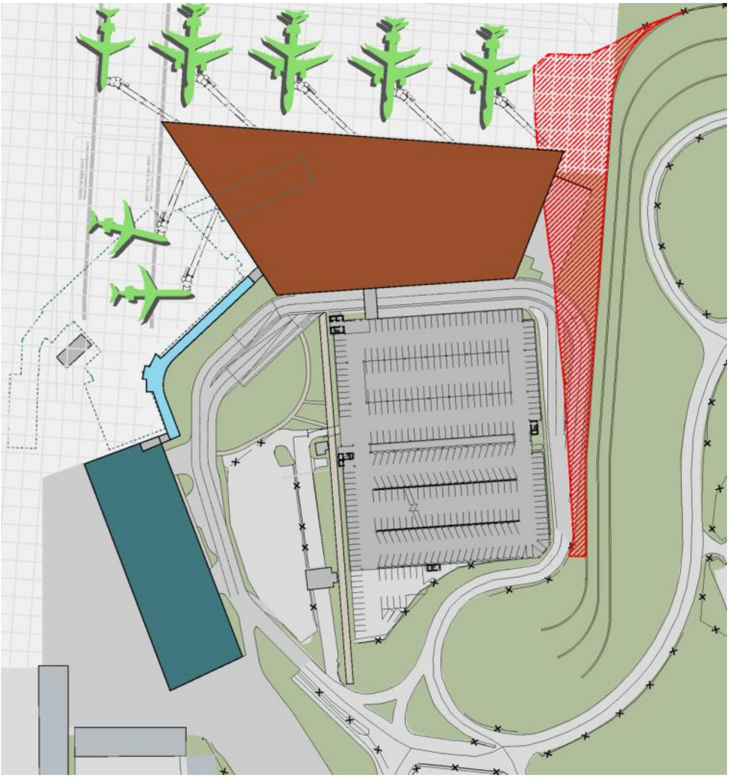
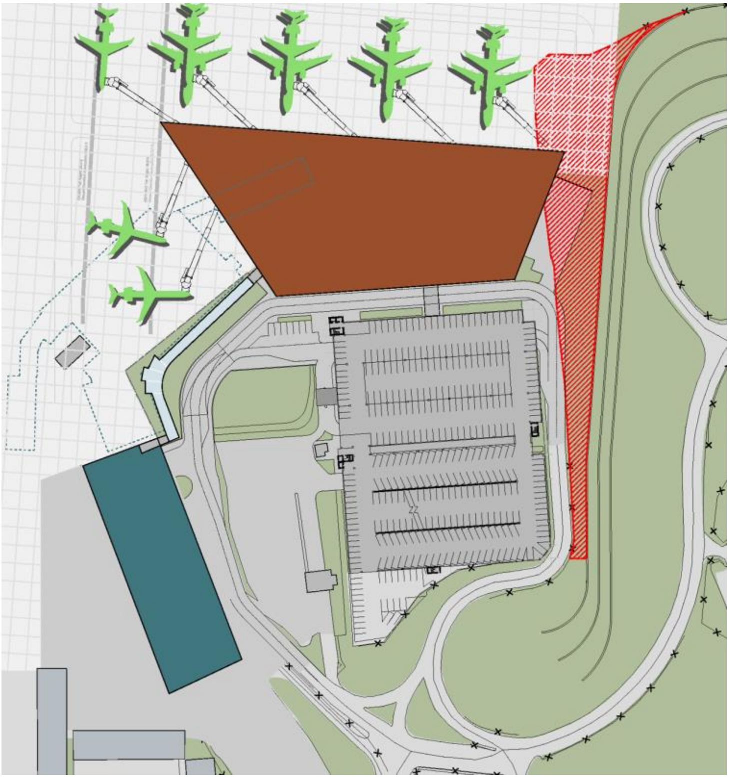
# Refined Alternatives

### Alternative 1A



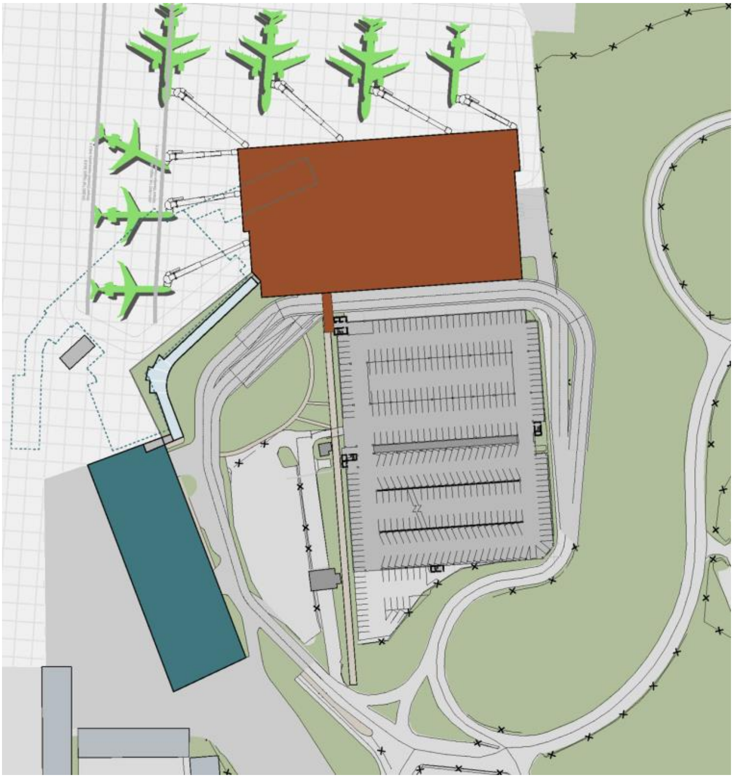
- Two level curb
- Maximizes aircraft
- Requires fill

### Alternative 1B



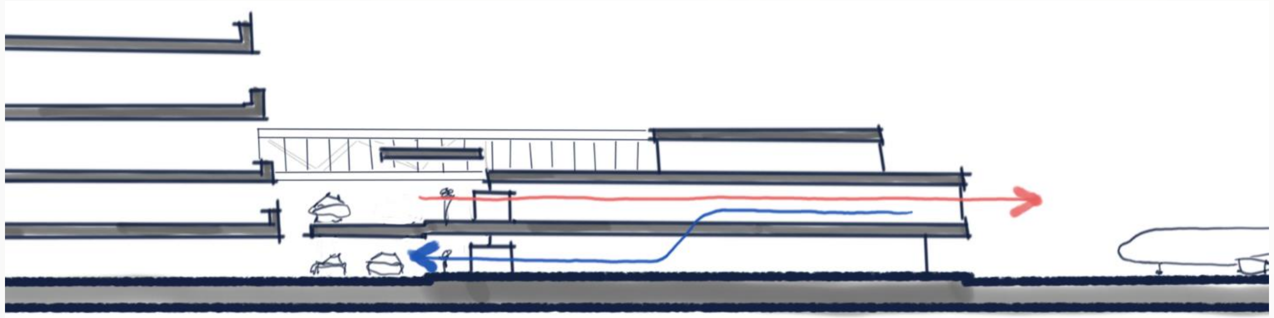
- Single level curb
- New curb in garage
- Requires fill

### Alternative 1C

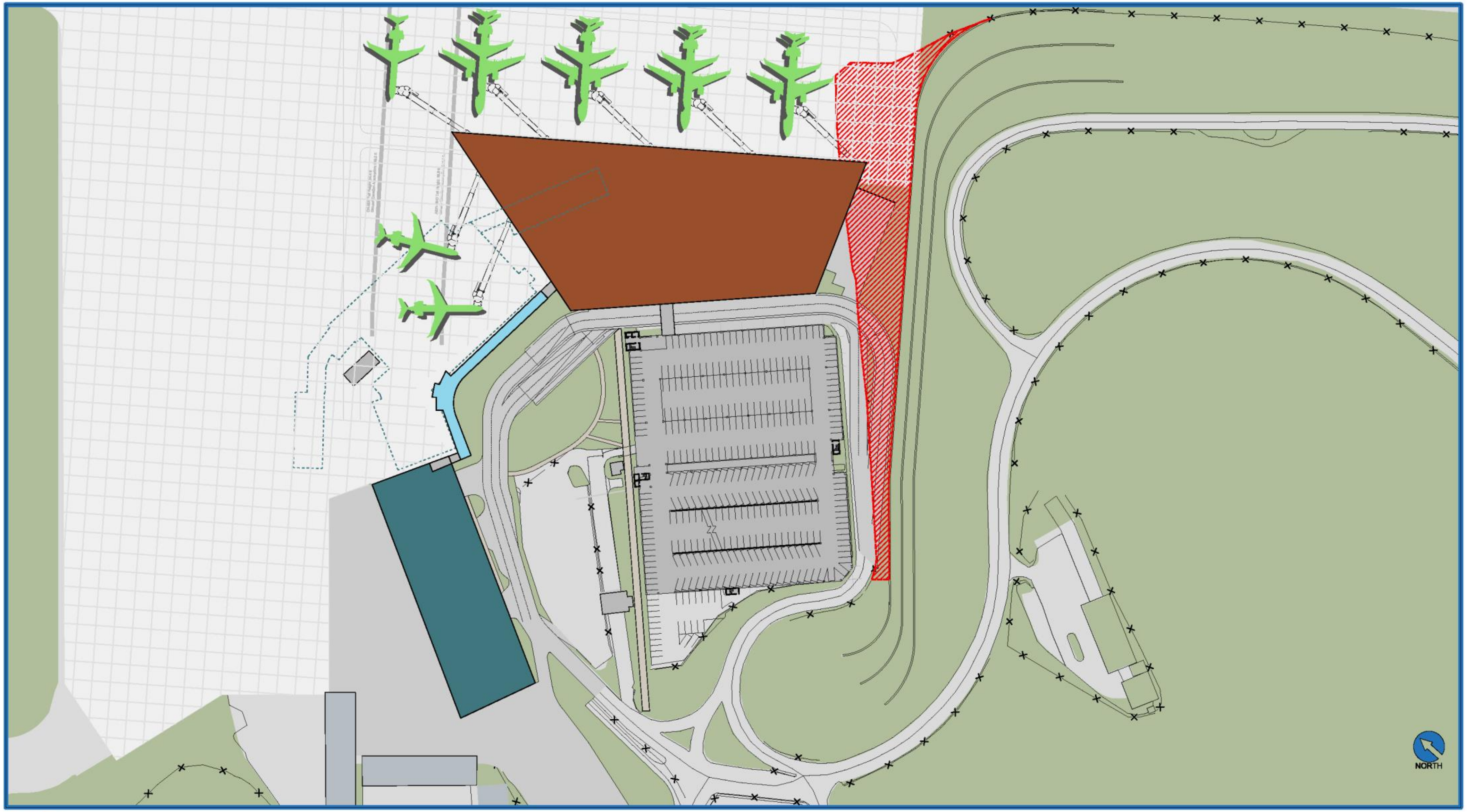


- Two level curb
- Standard building shape
- Minimizes fill

# Concept 1A



Two Level Curb




# CRW
# Partial Site Plan - Two Level Curb

File: 2 Crub - Partial Site - V2.dwg Layout: PS Last Saved: 1/11/2022 1:42 PM Plotted On: 1/28/2022 5:39 PM

Scale: 1/128"=1'-0"

Source:
Prepared by: Landrum & Brown

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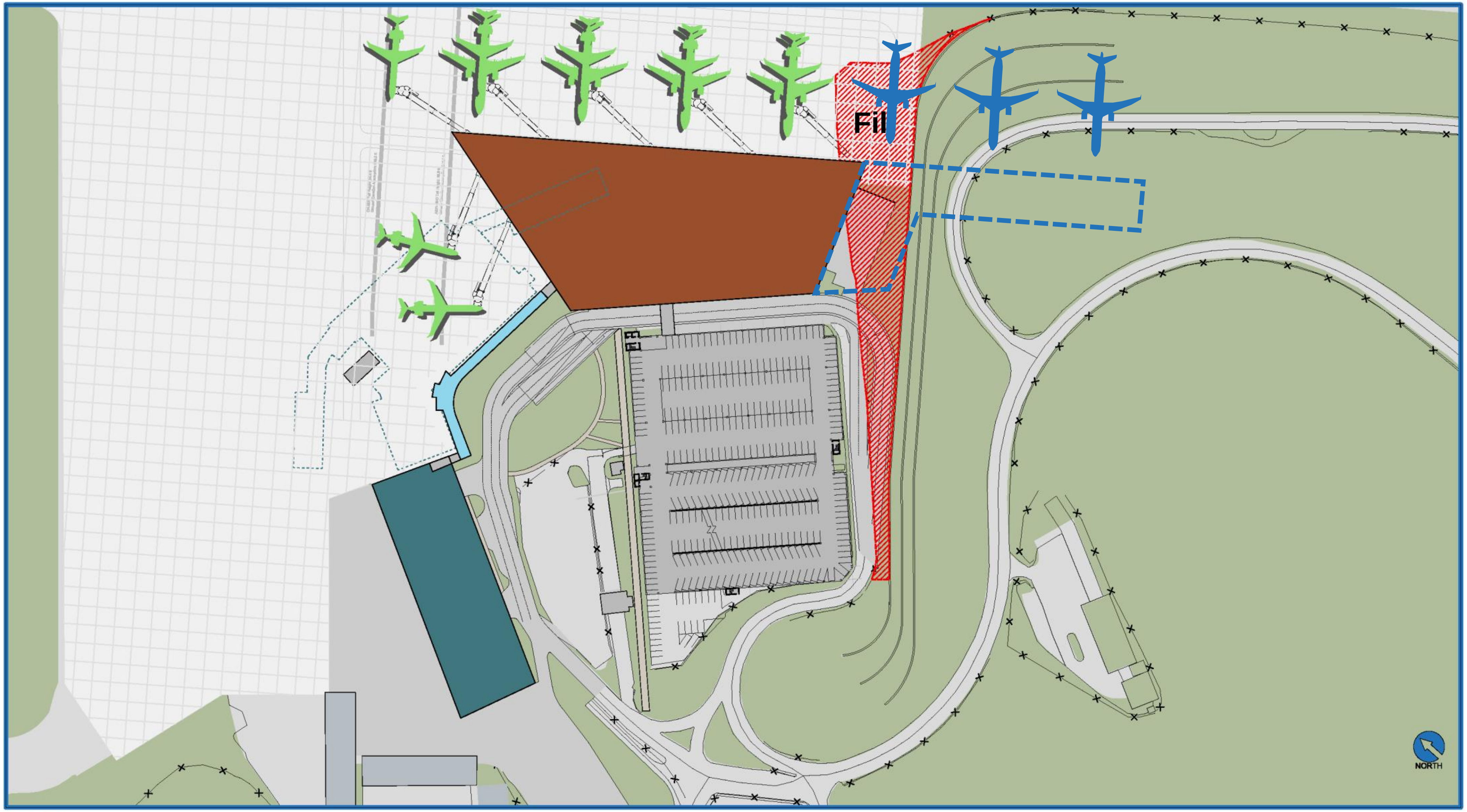


## CRW
## Partial Site Plan - Two Level Curb

File: 2 Crub - Partial Site - V2.dwg Layout: PS   Last Saved: 1/11/2022 1:42 PM Plotted On: 1/26/2022 5:39 PM

Scale: 1/128"=1'-0"

Source:
Prepared by: Landrum & Brown

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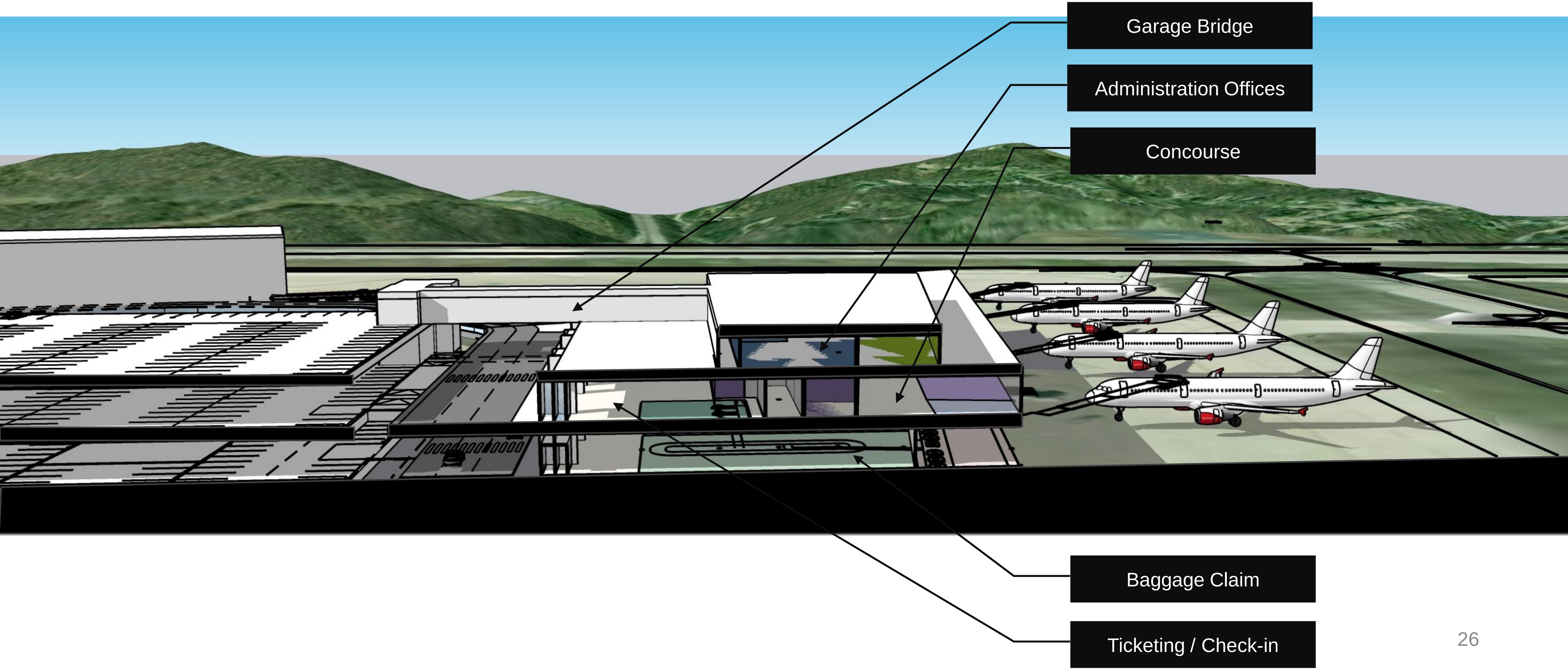
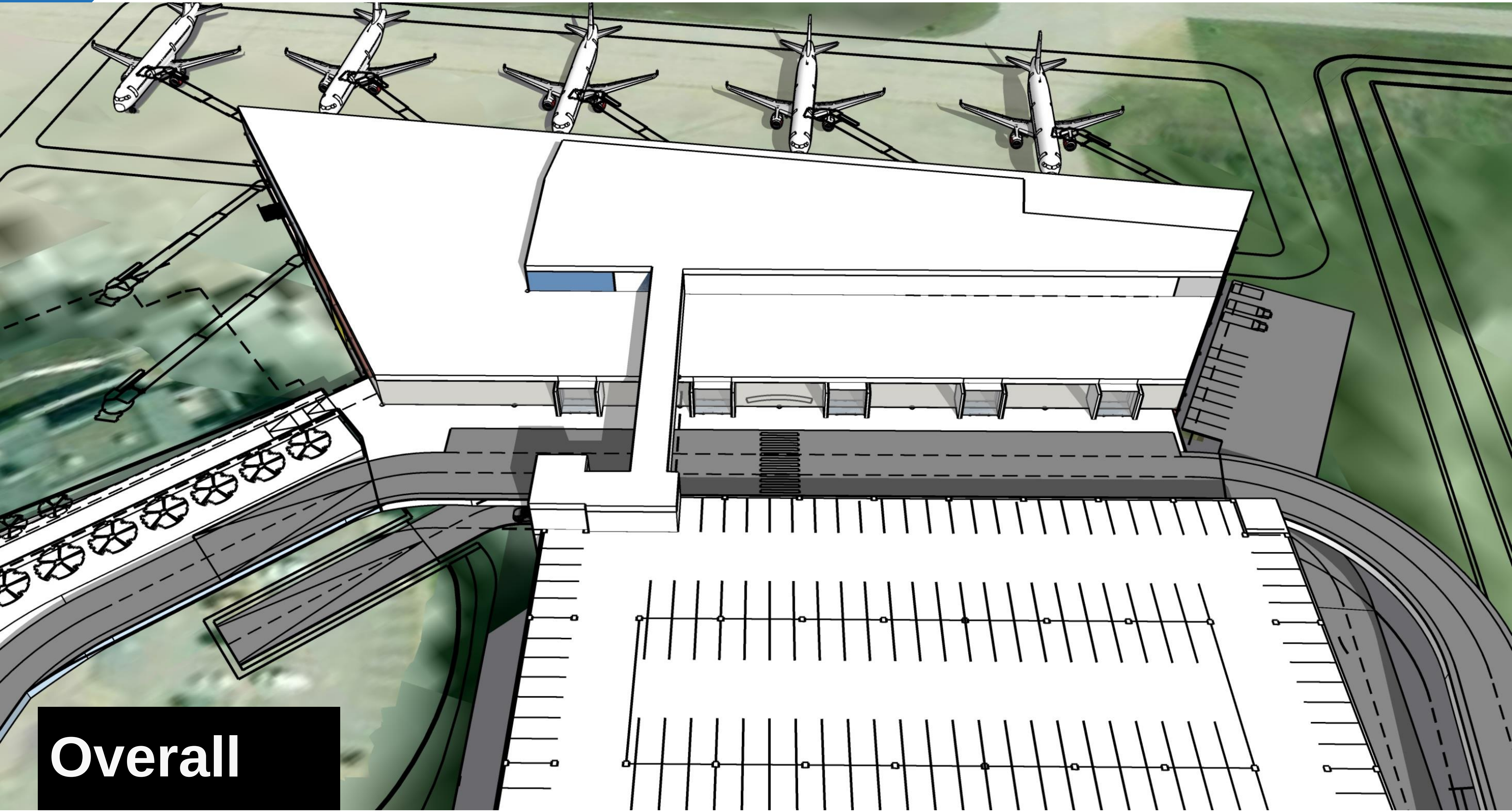
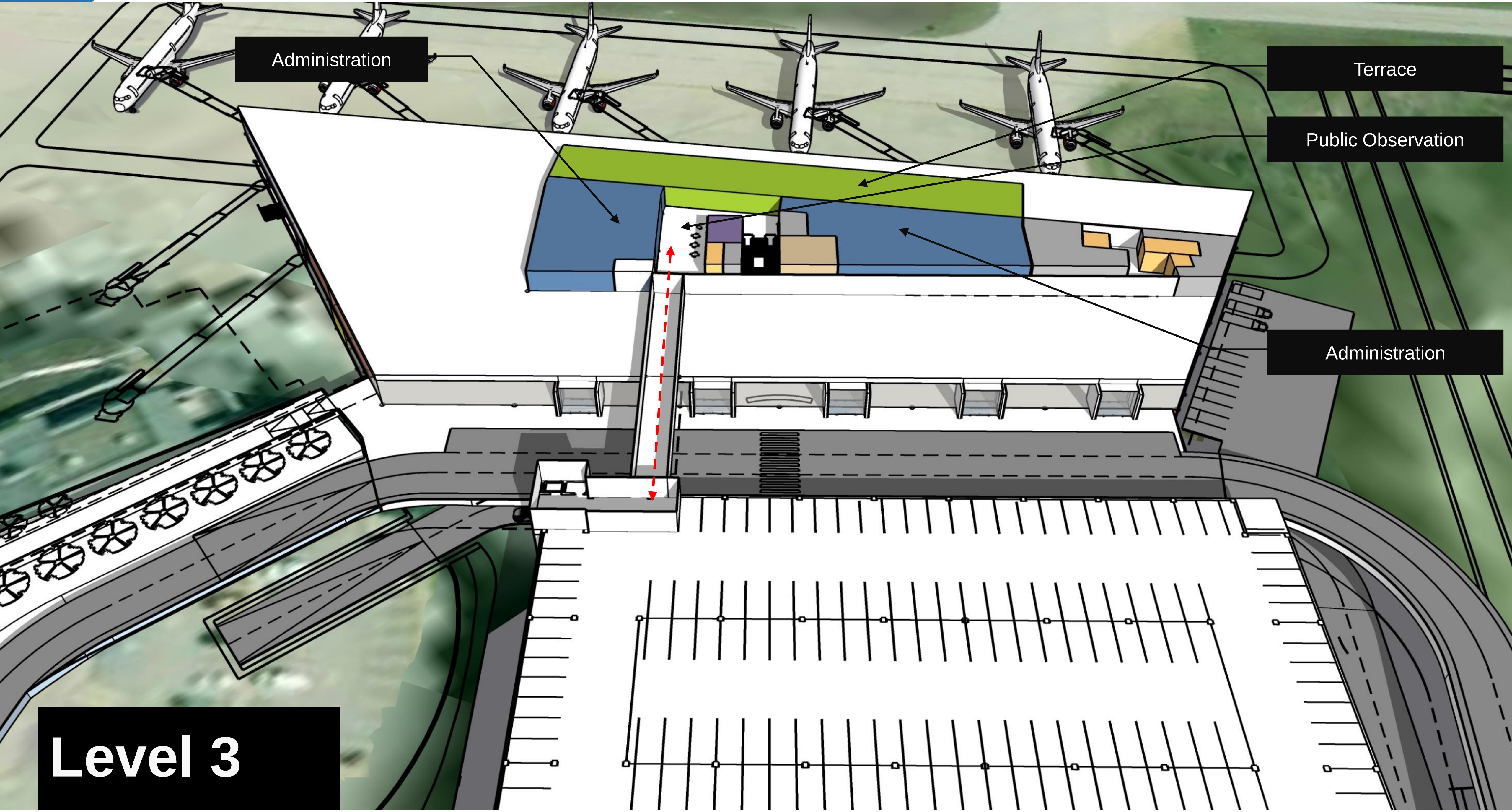
# Concept 1A Section

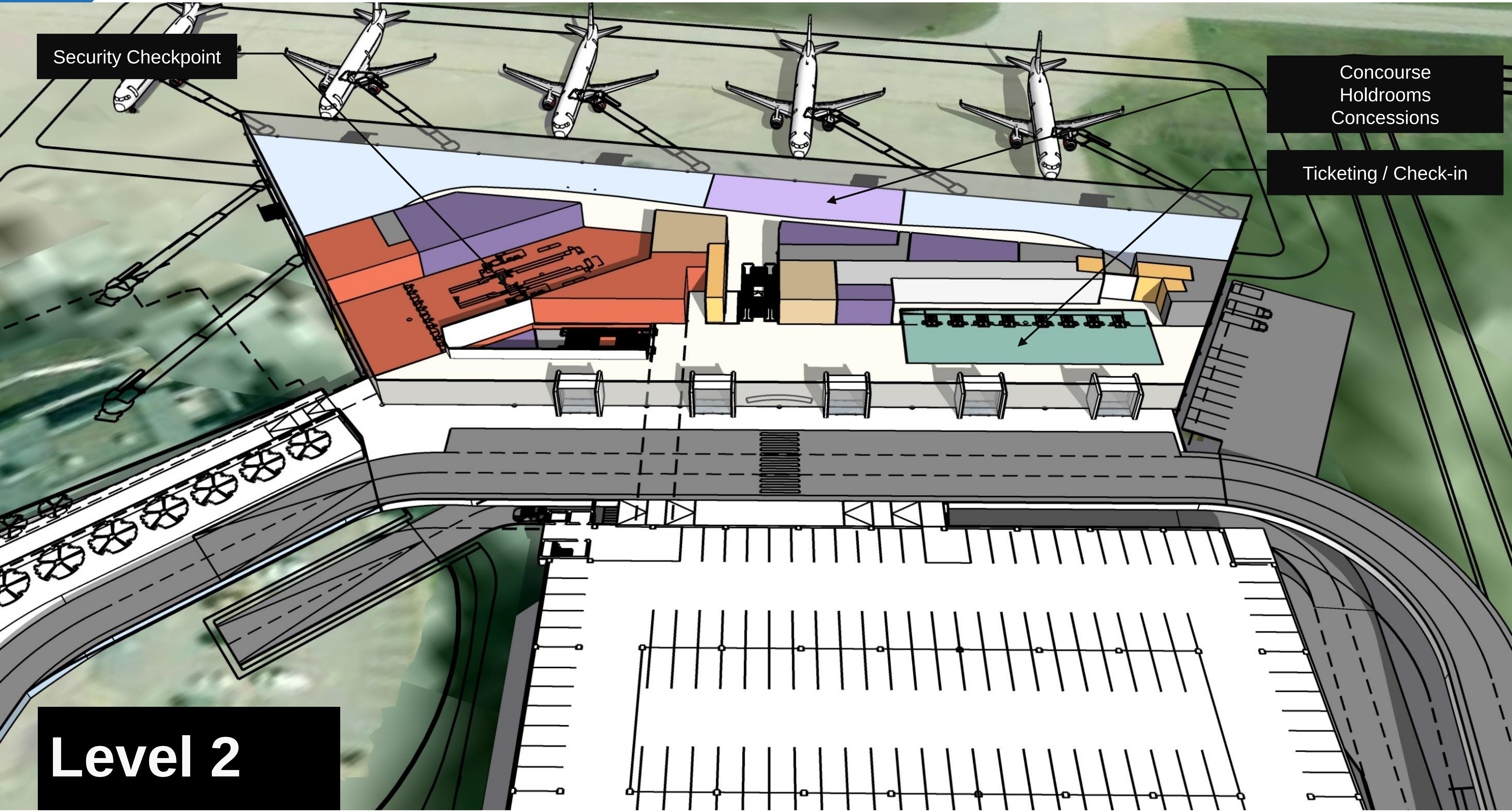




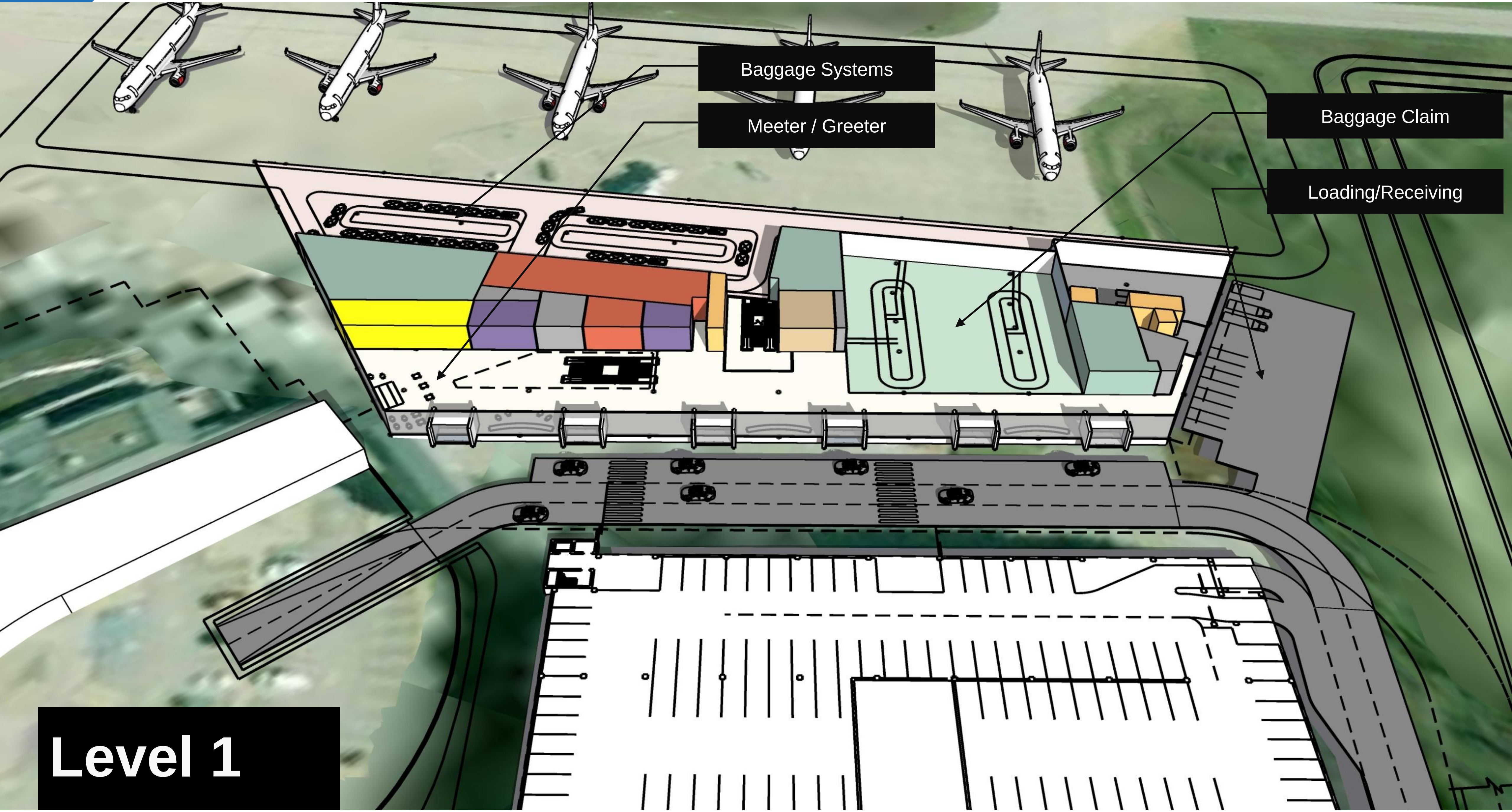
# Overall


Administration
Terrace
Public Observation
Administration

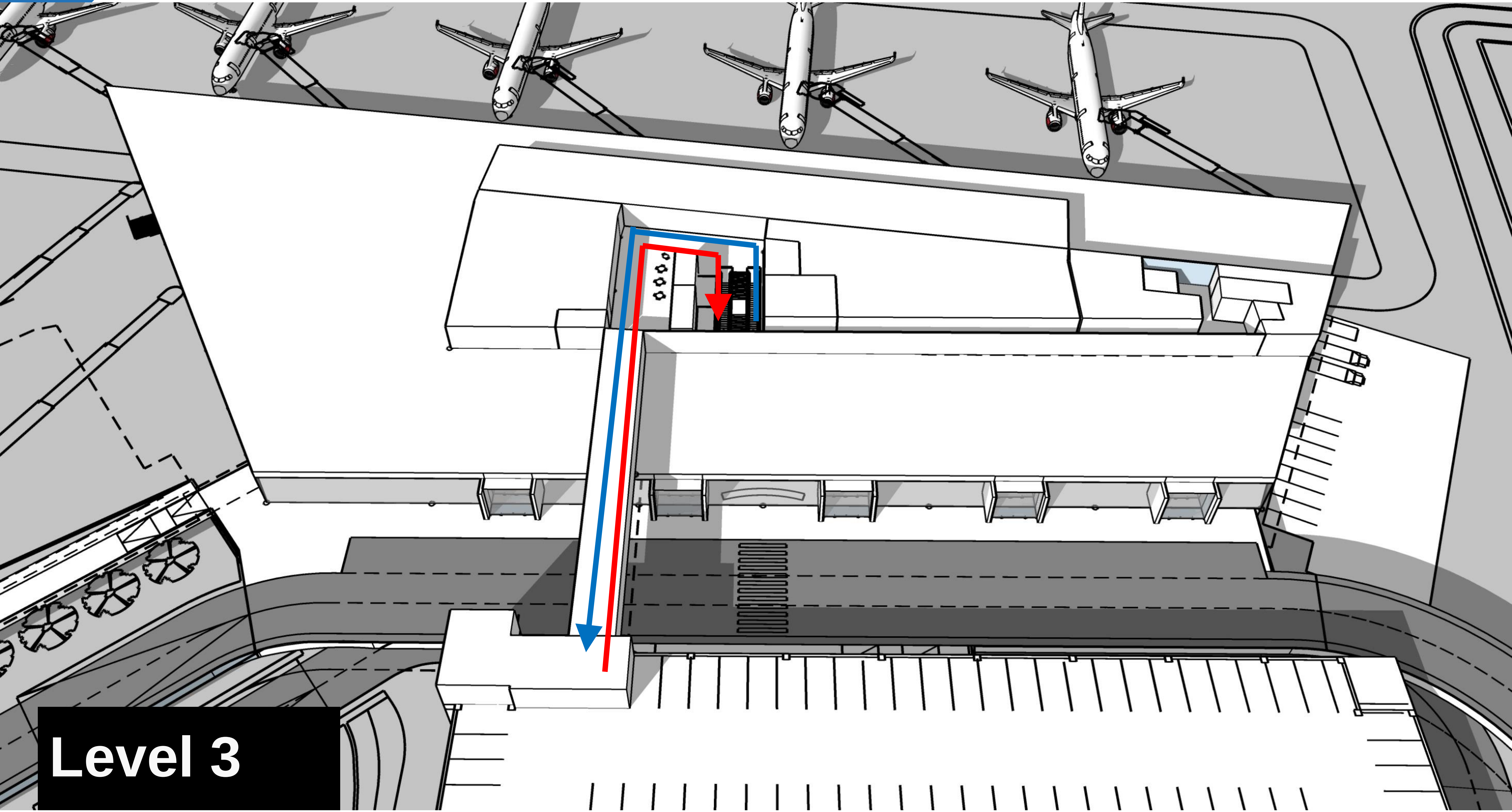
# Level 3

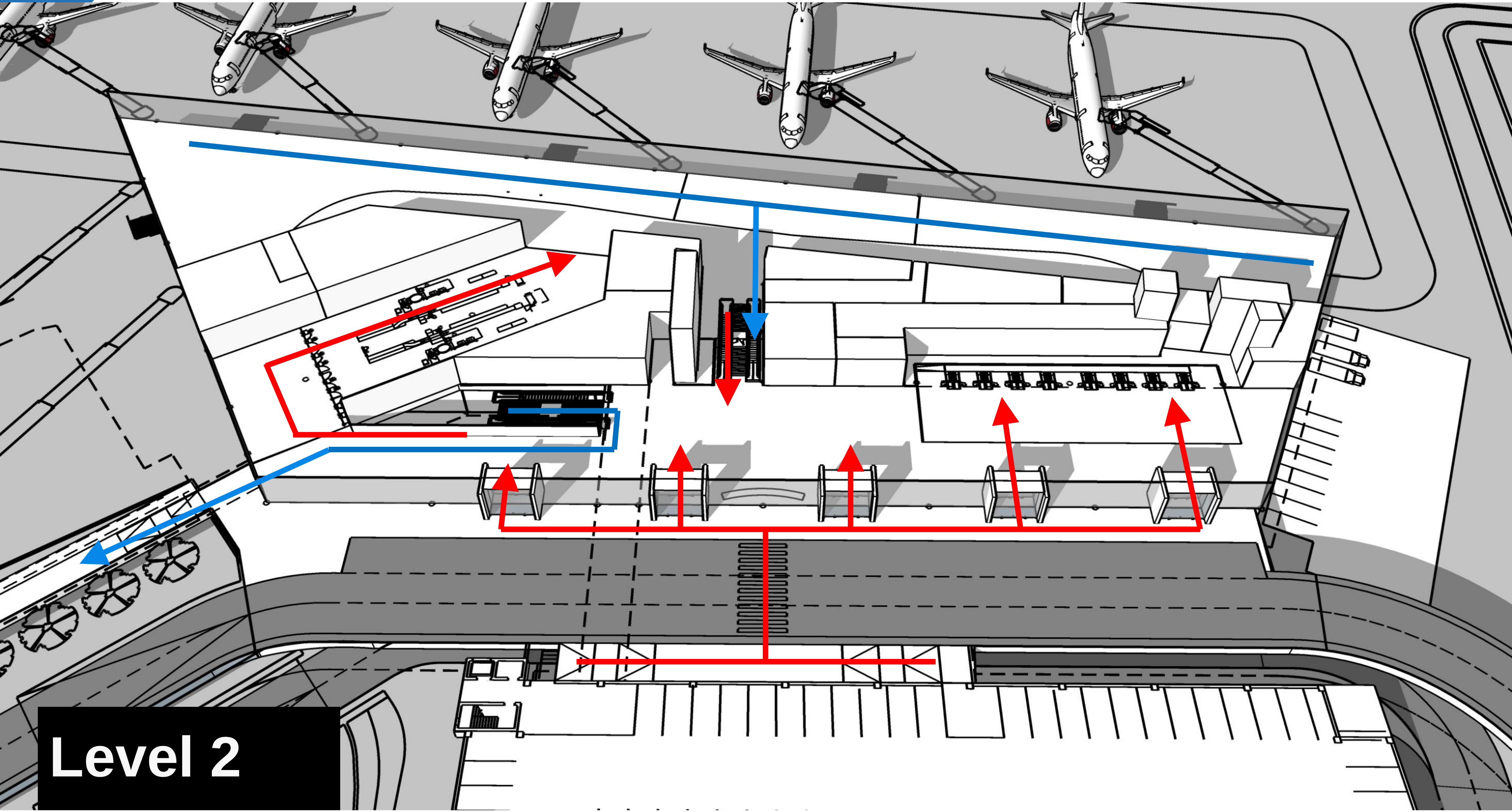


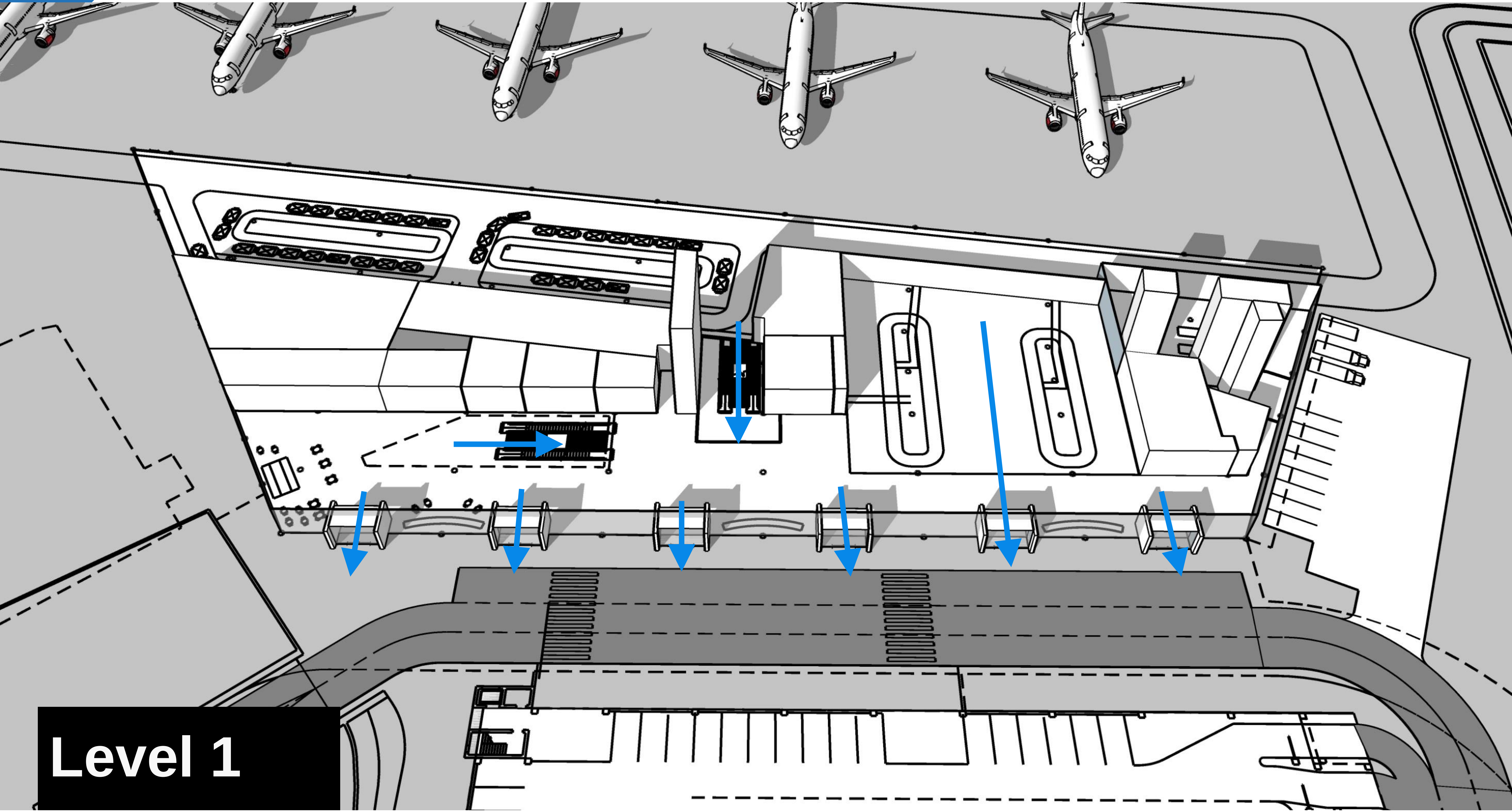
Security Checkpoint
Concourse
Holdrooms
Concessions
Ticketing / Check-in
Level 2

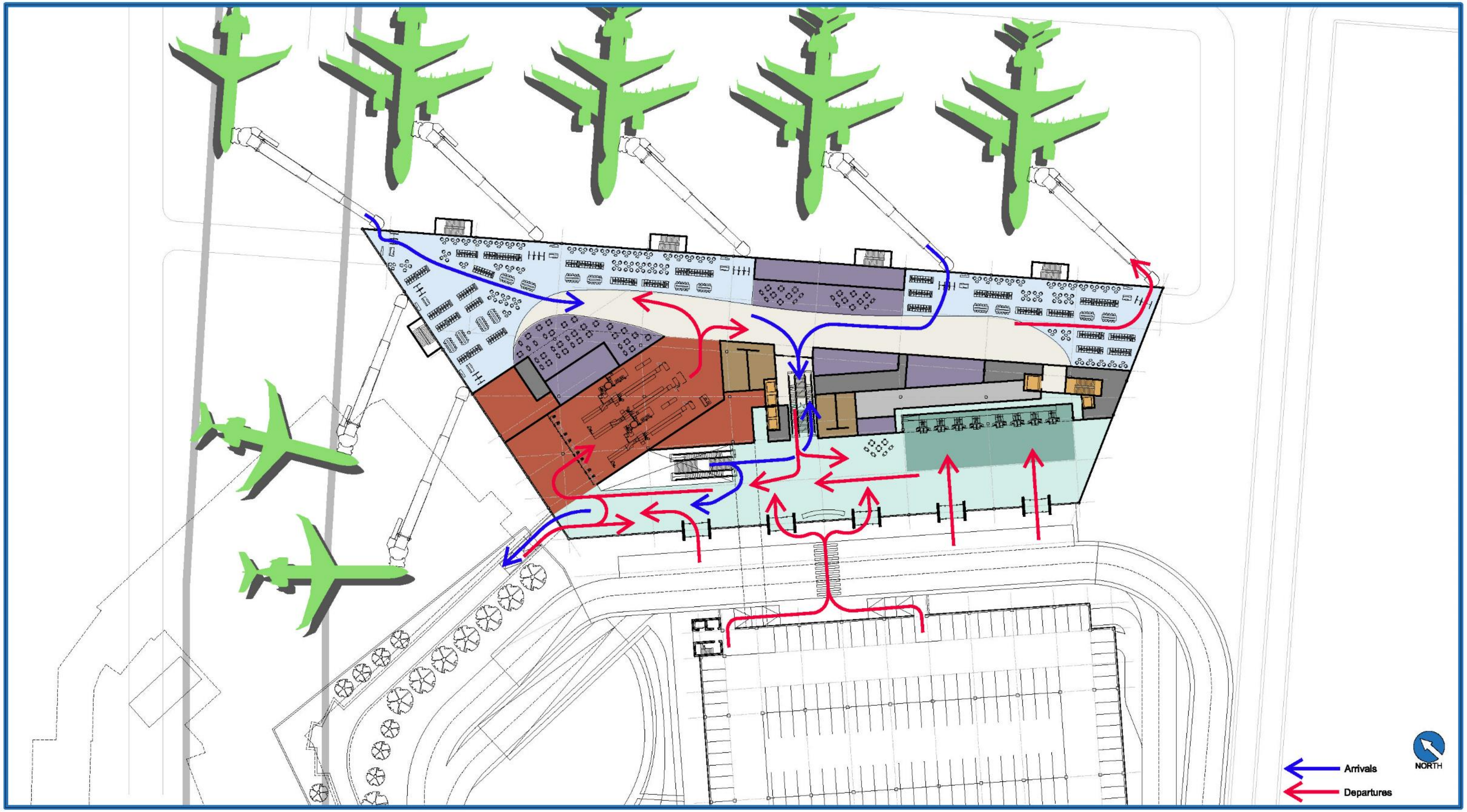


Baggage Systems
Meeter / Greeter
Baggage Claim
Loading/Receiving
Level 1


Level 3


Level 2


Level 1




## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Check-In
- Concession Support
- Loading Dock
- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

# CRW
# Second Floor Alternative 1A

File: 2 Crub - L2 - V2.dwg Layout: L2 Last Saved: 1/25/2022 1:54 PM Plotted On: 1/26/2022 10:43 AM

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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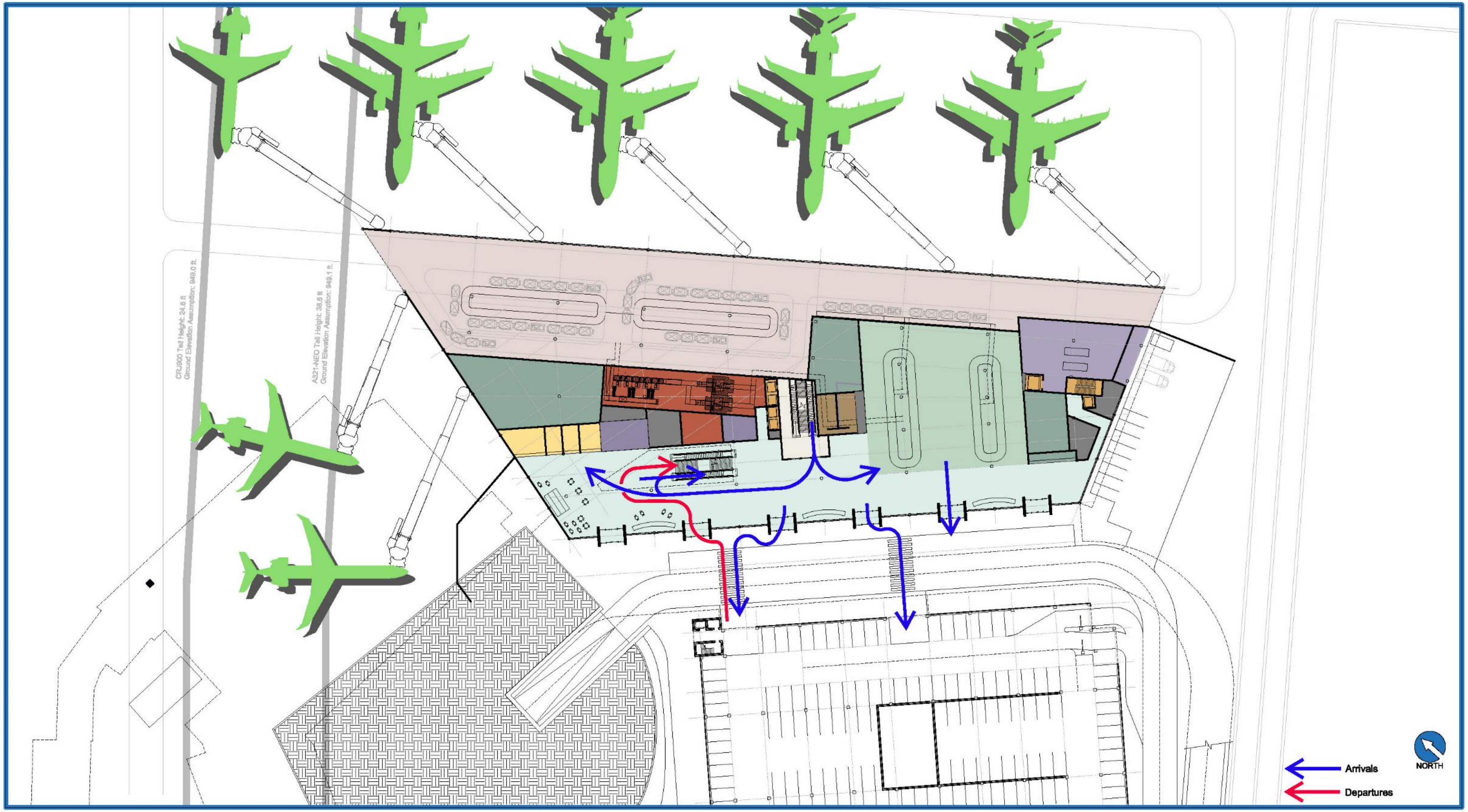


## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Check-In
- Concession Support
- Loading Dock
- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

# CRW
# First Floor Alternative 1A

File: 2 Crub - L1 - V2.dwg Layout: L1 Last Saved: 1/25/2022 2:44 PM Plotted On: 1/26/2022 10:49 AM

Scale: 1/64"=1'-0"

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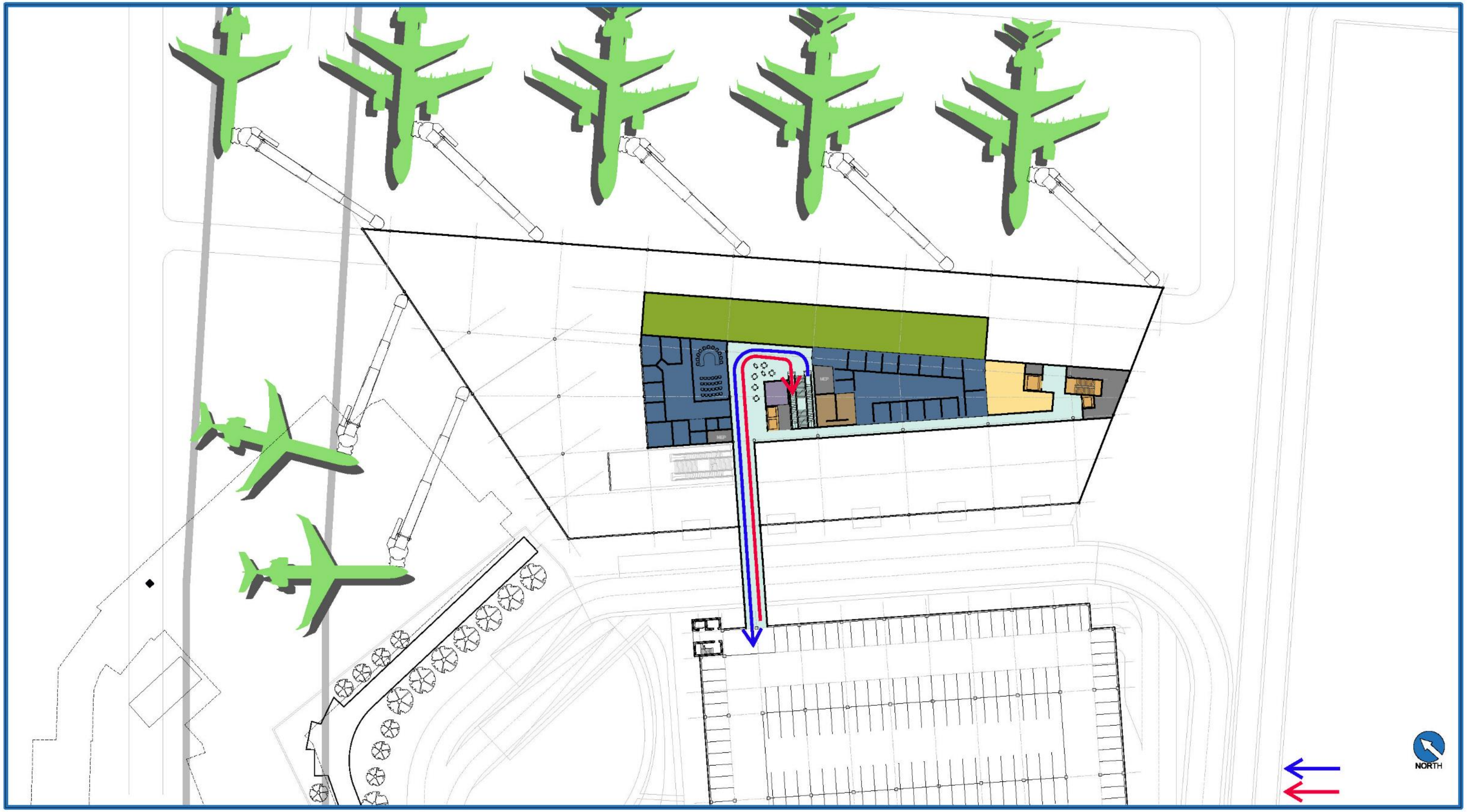


## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Check-In
- Concession Support
- Loading Dock
- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

# CRW
# Third Floor Alternative 1A

File: 2 Crub - L3 - V2.dwg Layout: L3 Last Saved: 1/25/2022 3:09 PM Plotted On: 1/26/2022 10:56 AM

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Check-In
- Concession Support
- Loading Dock
- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

# CRW
# Administration Offices - 1A

File: 2 Crub - L3 - V2.dwg Layout: L3with Office Labels Last Saved: 1/25/2022 3:09 PM Plotted On: 1/26/2022 10:56 AM

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown
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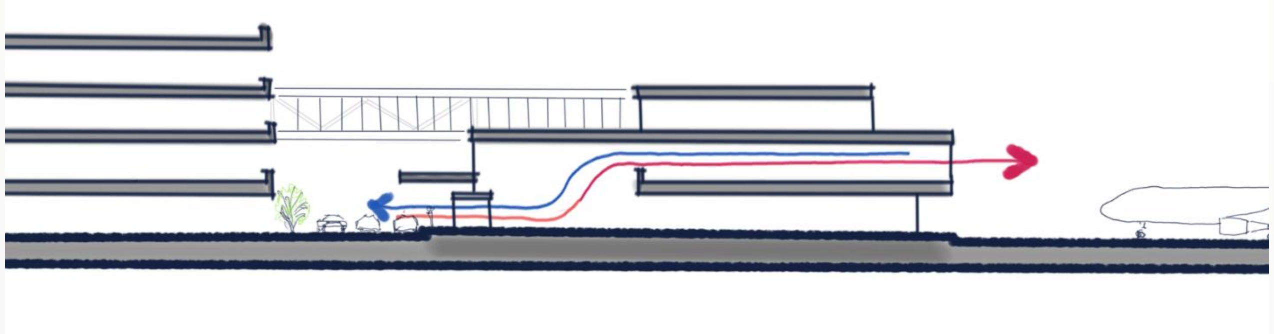
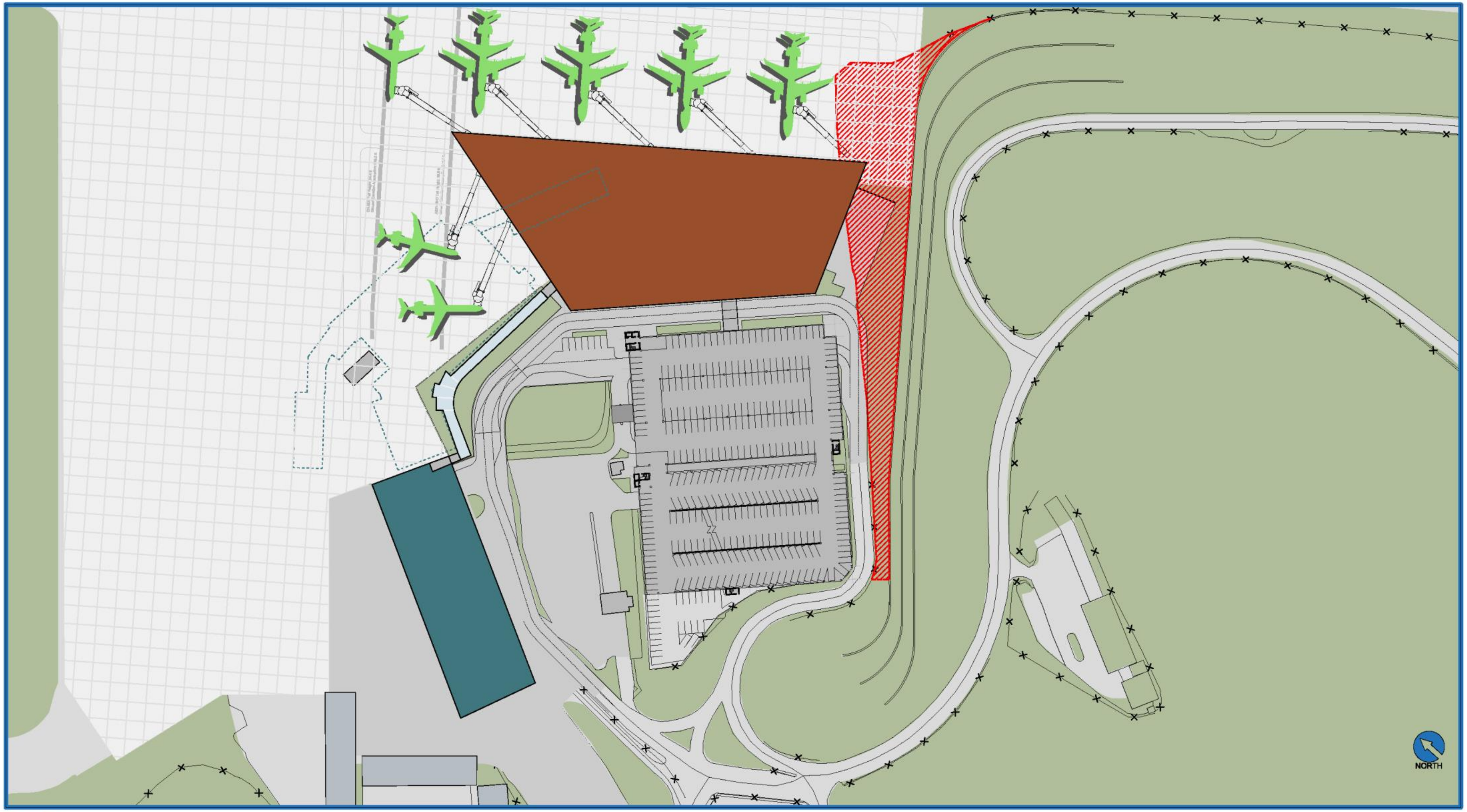
# Concept 1B



YEAGER AIRPORT




# CRW
# Partial Site Plan - One Level Curb

File: 1 Crub - Partial Site - V1.dwg Layout: PS Last Saved: 1/24/2022 11:19 AM Plotted On: 1/26/2022 5:09 PM

Scale: 1/128"=1'-0"

Source:
Prepared by: Landrum & Brown
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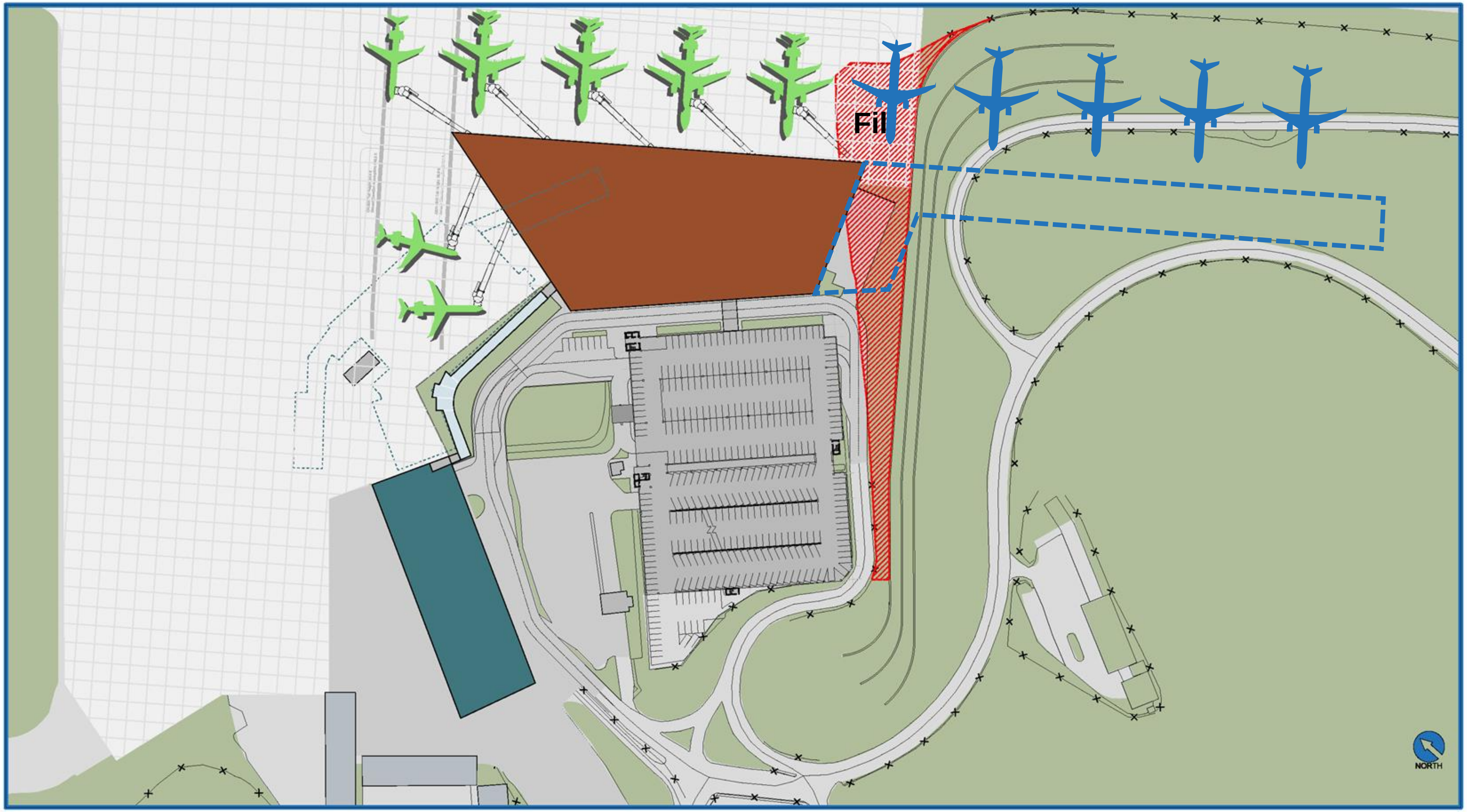


CRW

Partial Site Plan - One Level Curb

File: 1 Crub - Partial Site - V1.dwg Layout: PS Last Saved: 1/24/2022 11:19 AM Plotted On: 1/26/2022 5:09 PM

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Source:
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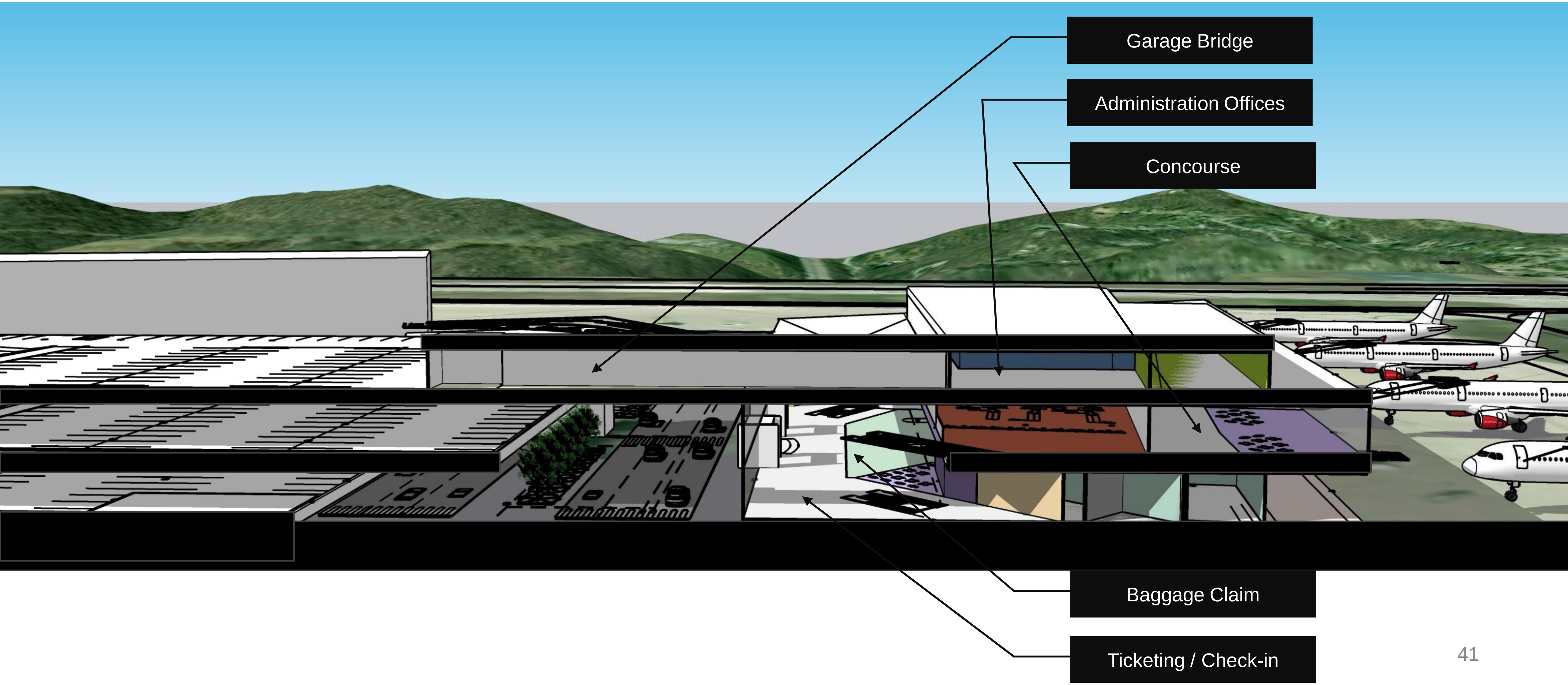
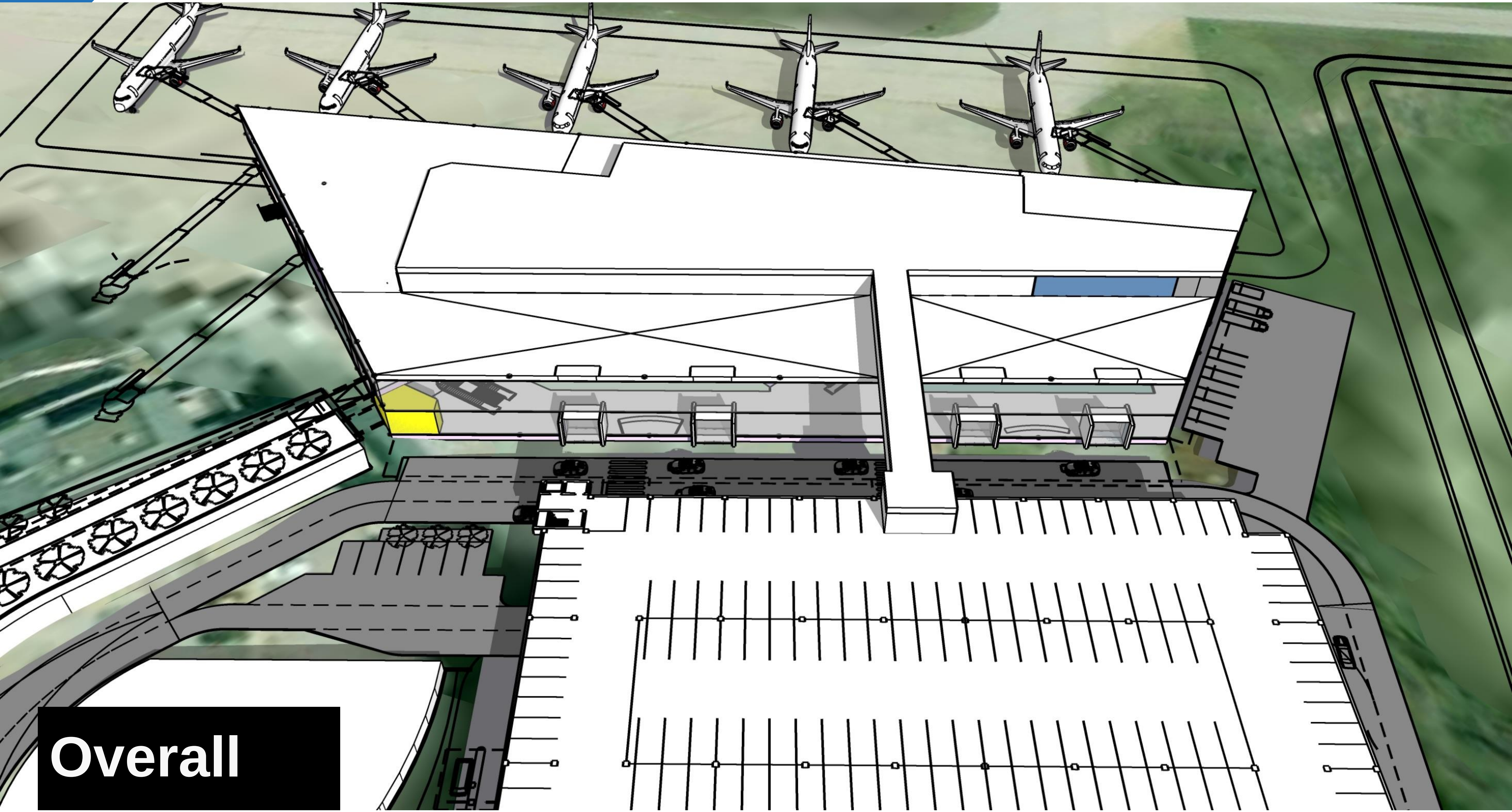
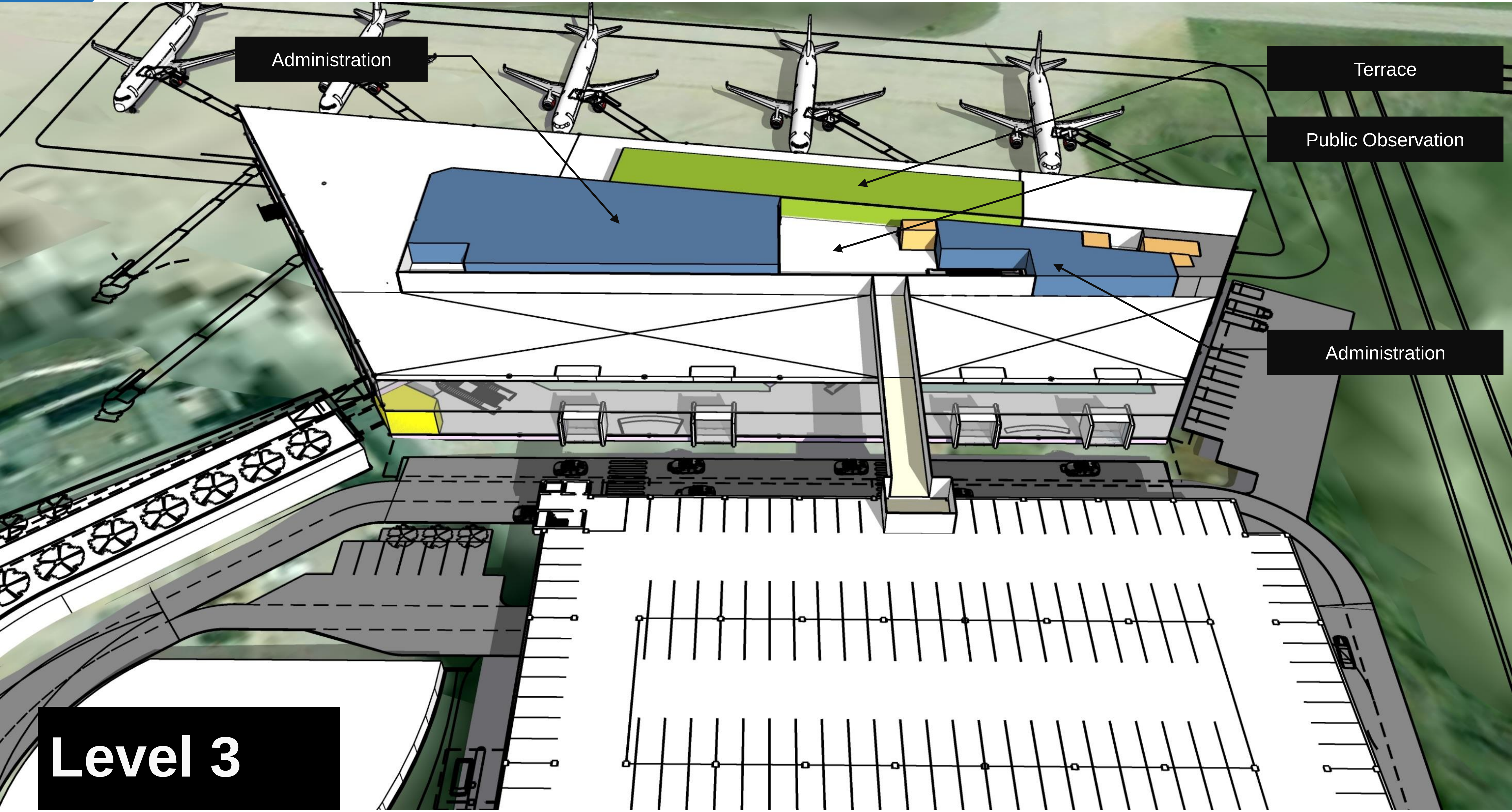
# Concept 1B Section

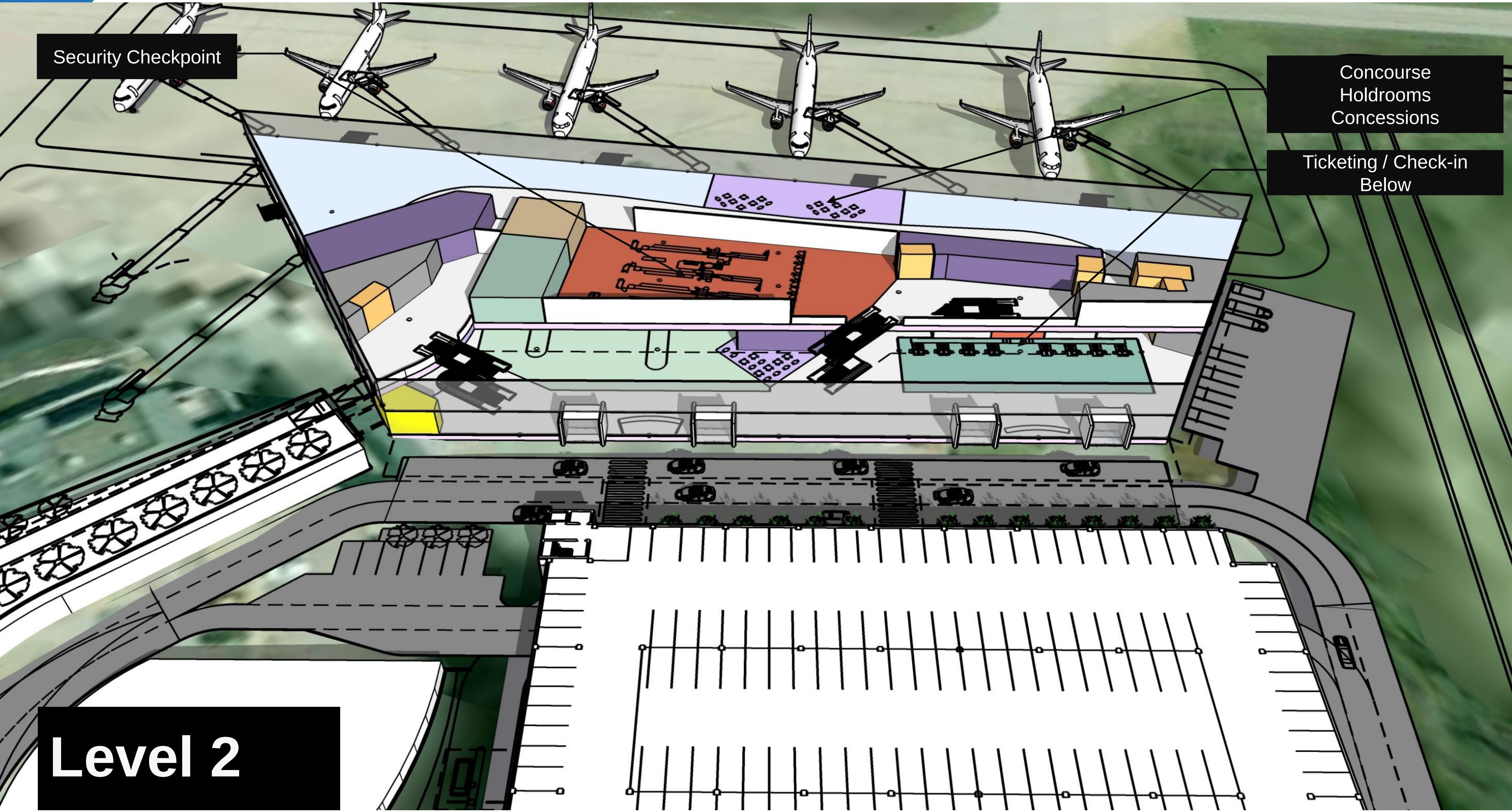


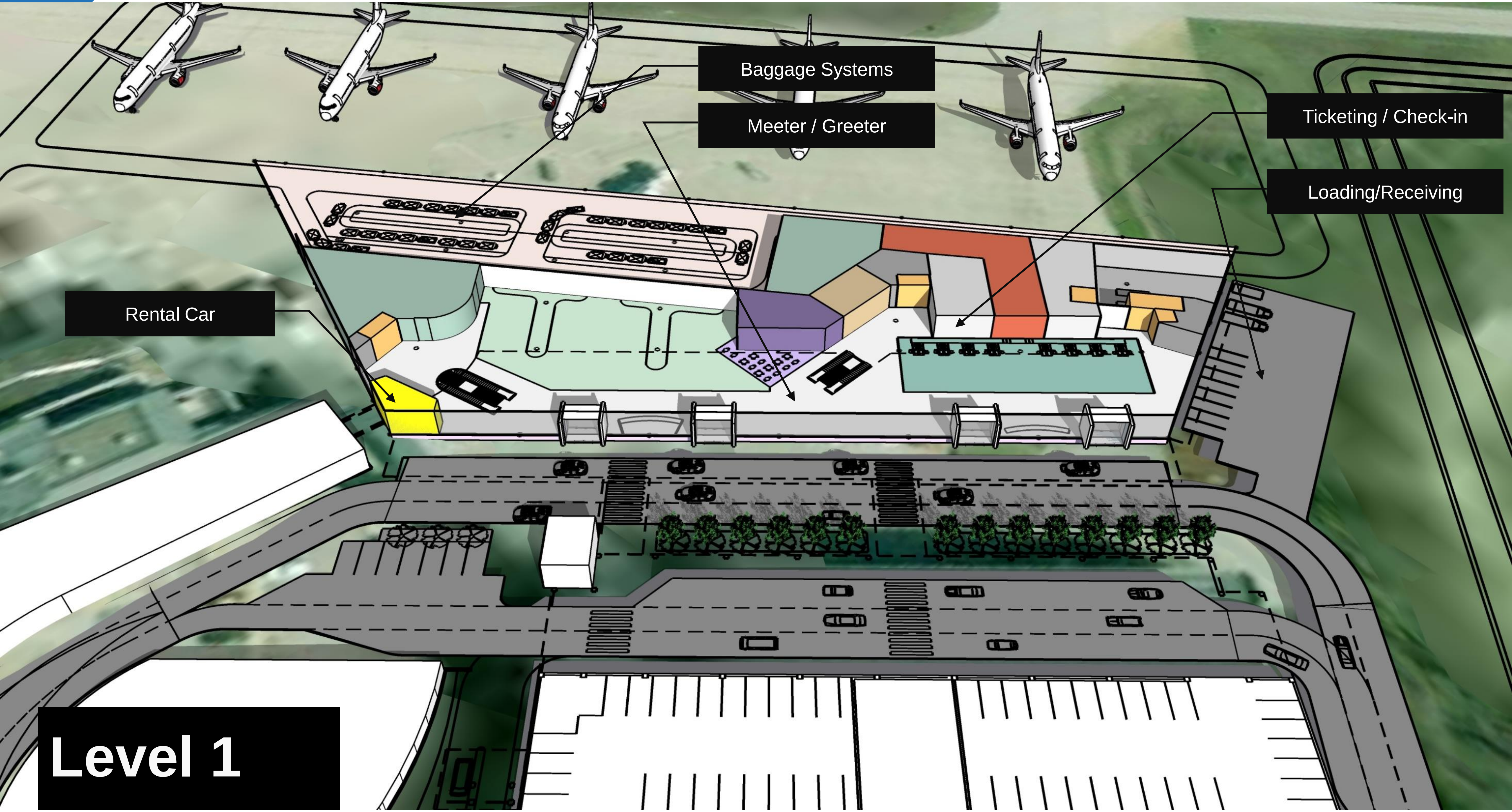


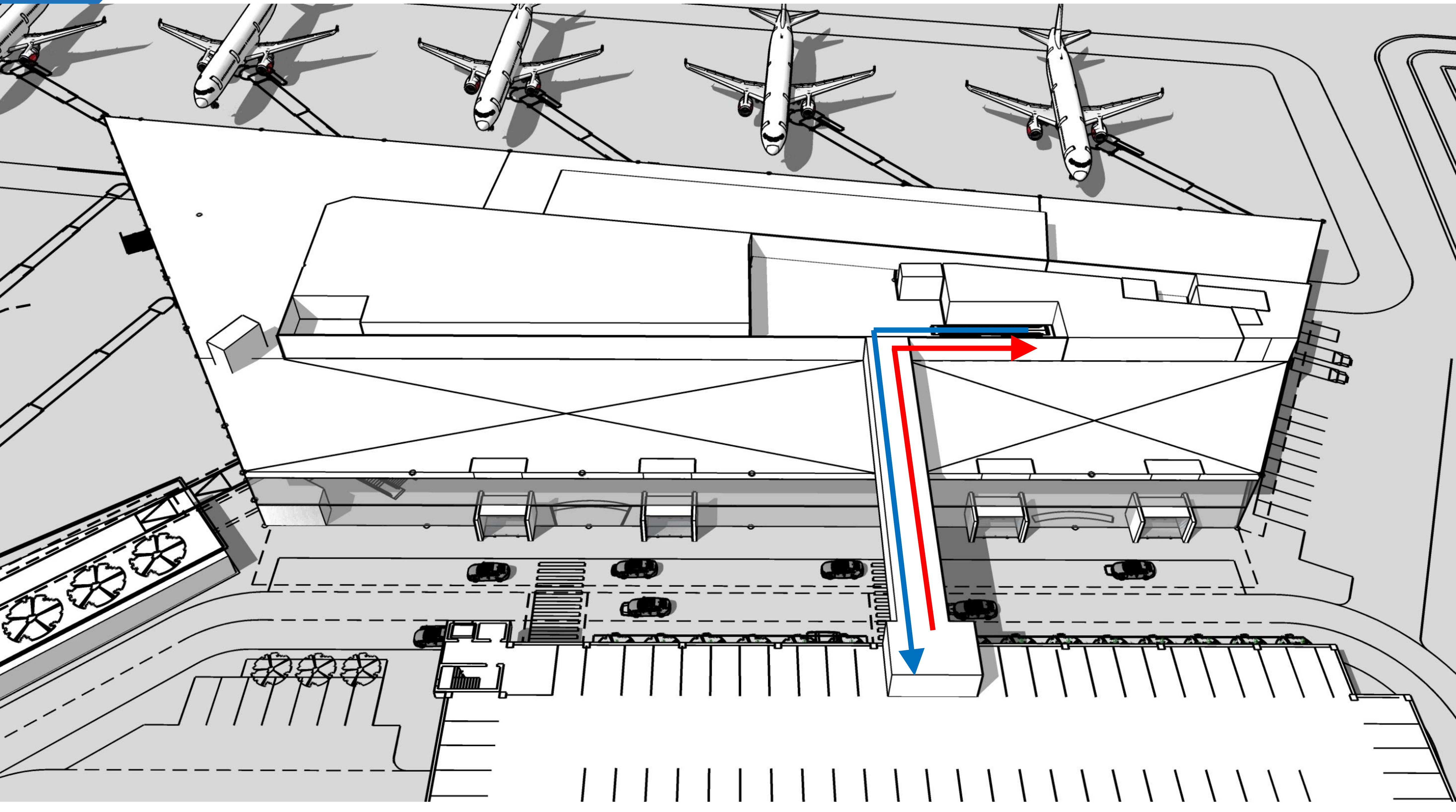
# Overall

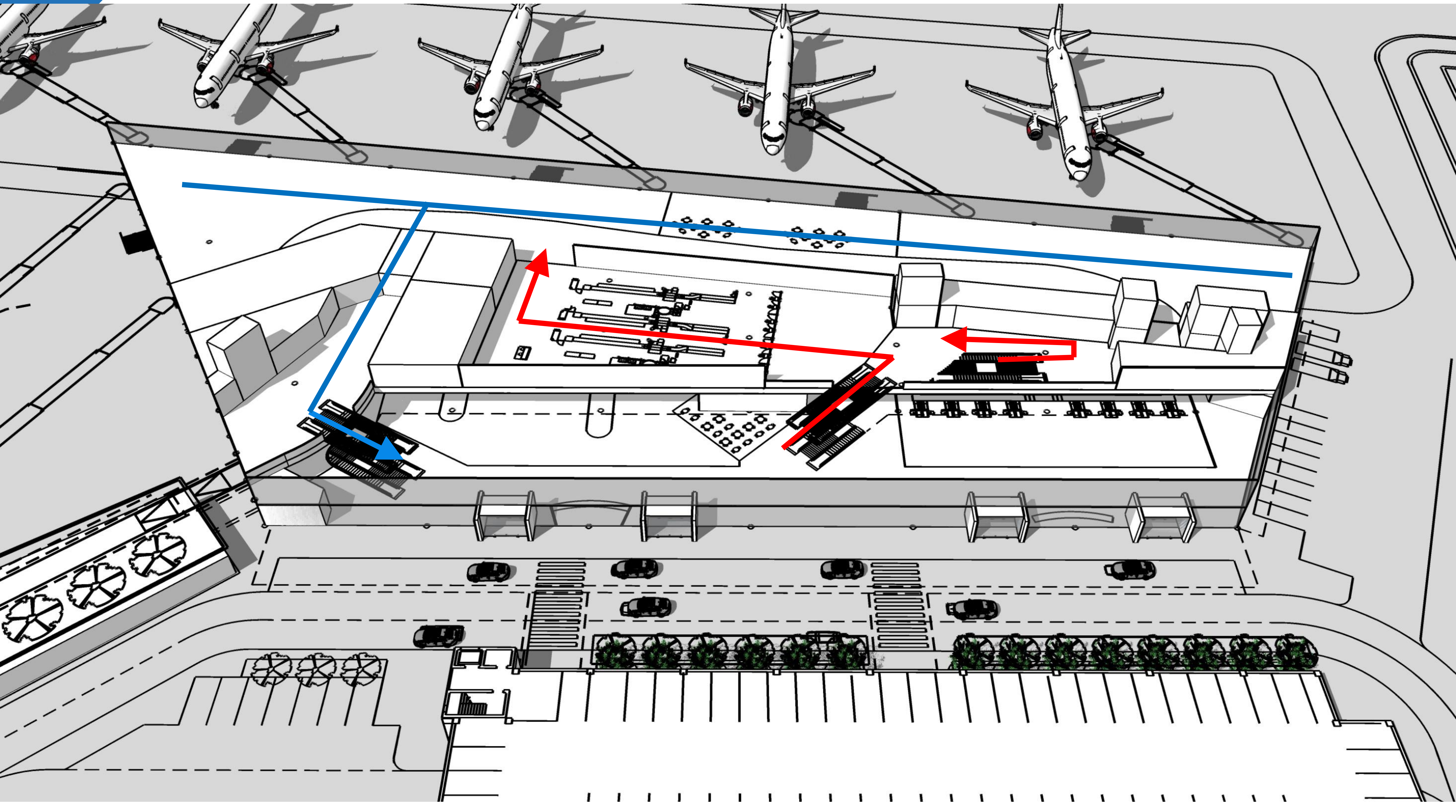

Administration
Terrace
Public Observation
Administration

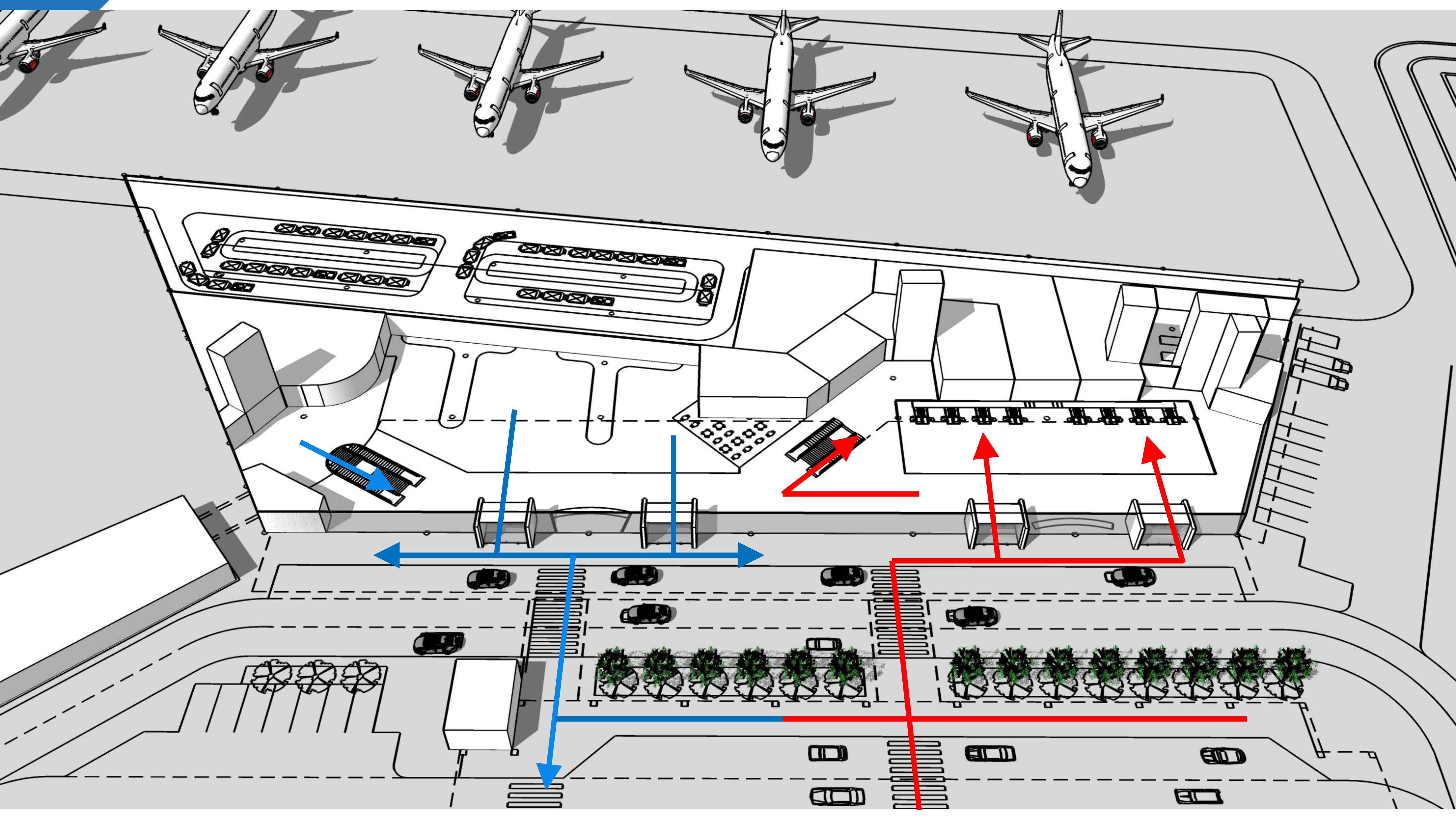
# Level 3

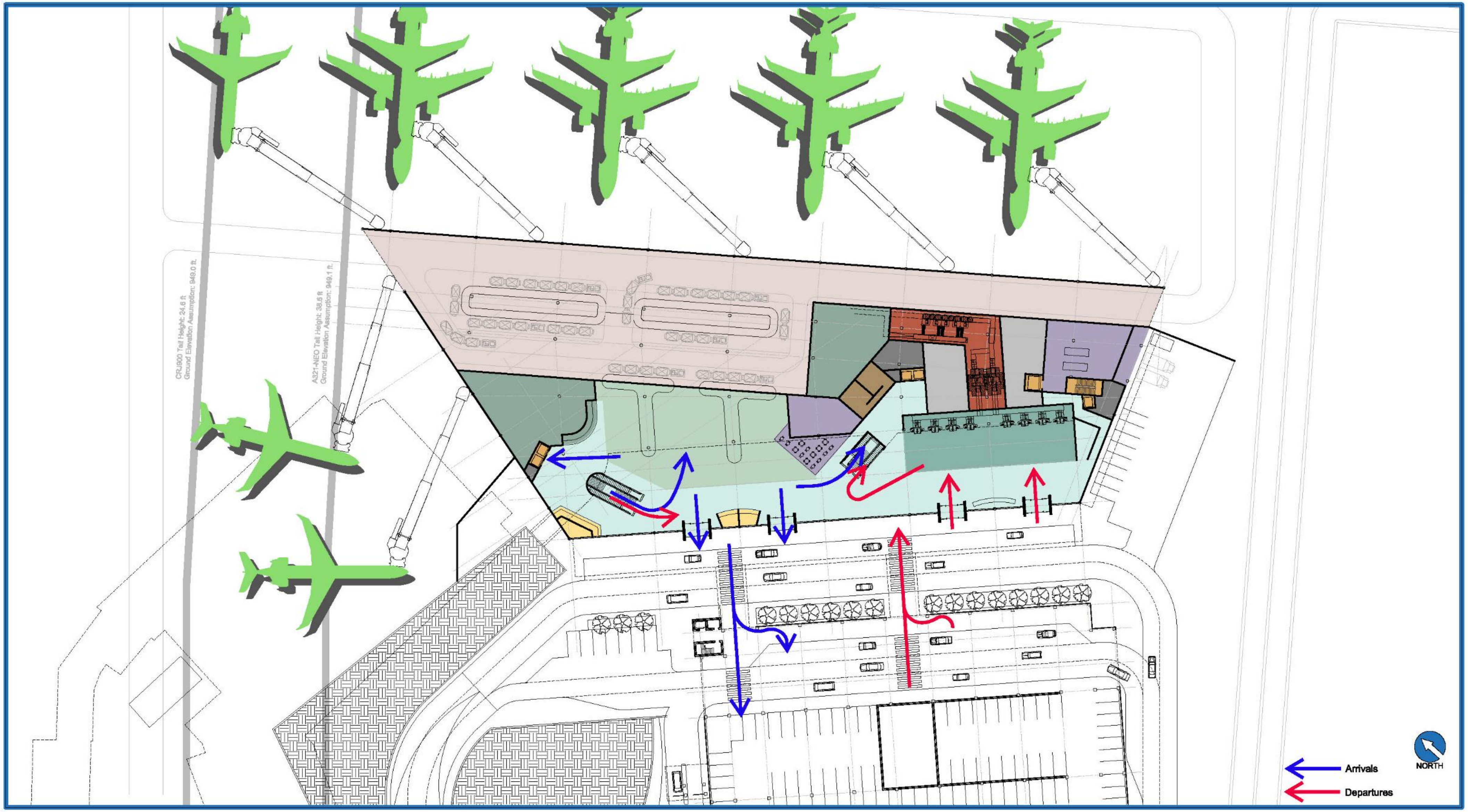

Security Checkpoint
Concourse
Holdrooms
Concessions
Ticketing / Check-in
Below
Level 2


Baggage Systems
Meeter / Greeter
Ticketing / Check-in
Loading/Receiving
Rental Car
Level 1










## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Check-In
- Concession Support
- Loading Dock
- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

# CRW
# First Floor Alternative 1B

File: 1 Crub - L1 - V2.dwg Layout: L1 Last Saved: 1/25/2022 1:33 PM Plotted On: 1/26/2022 10:21 AM

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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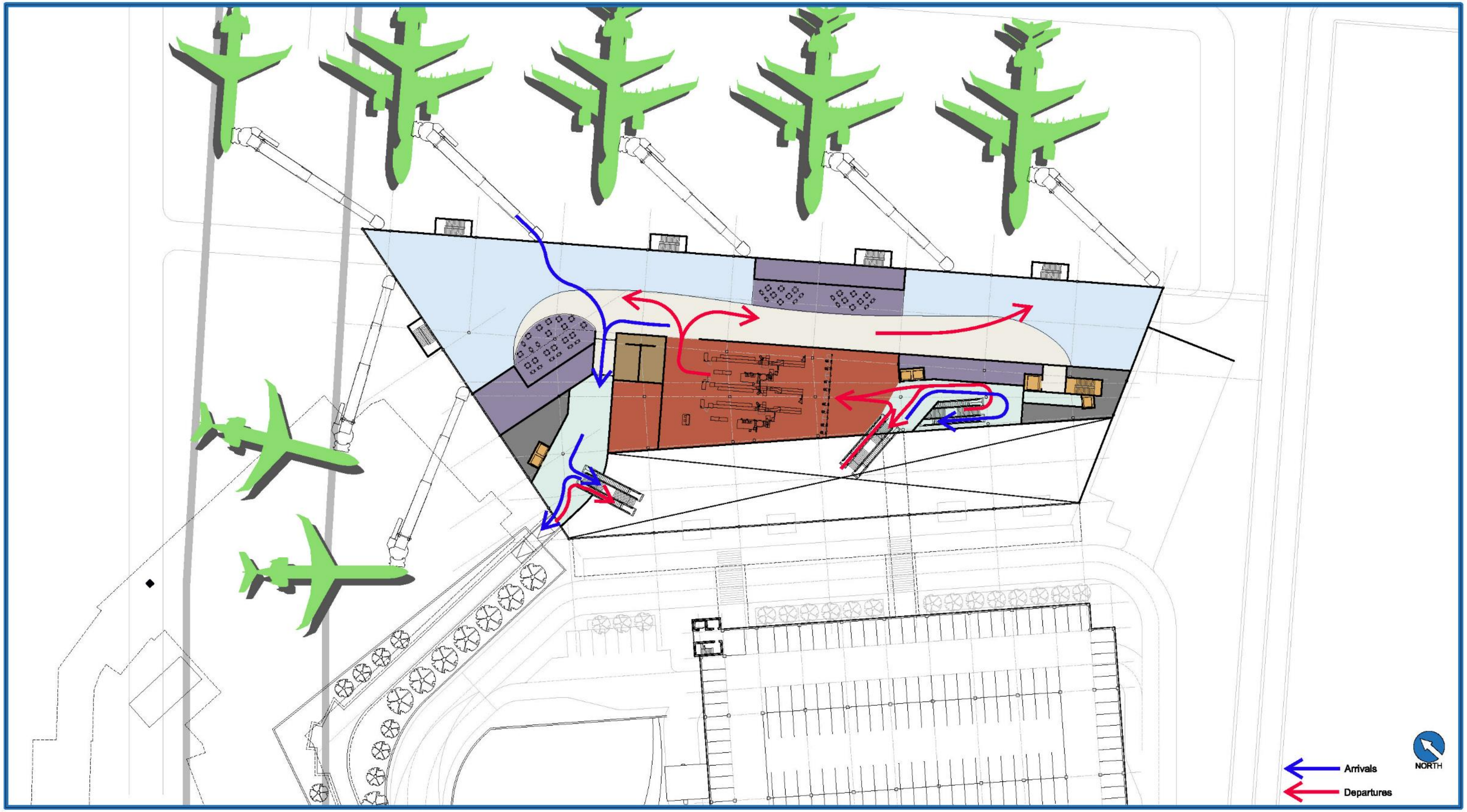


## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Check-In
- Concession Support
- Loading Dock
- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

# CRW
# Second Floor Alternative 1B

File: 1 Crub - L2 - V2.dwg Layout: L2 Last Saved: 1/25/2022 1:32 PM Plotted On: 1/26/2022 10:22 AM

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Check-In
- Concession Support
- Loading Dock
- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

# CRW
# Third Floor Alternative 1B

File: 1 Crub - L3 - V2.dwg Layout: L3 Last Saved: 1/25/2022 1:30 PM Plotted On: 1/26/2022 10:35 AM

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

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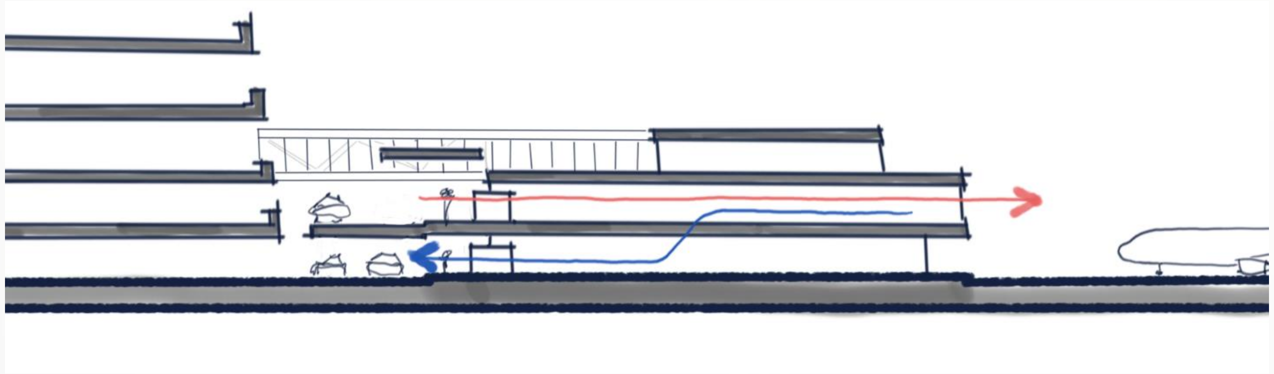
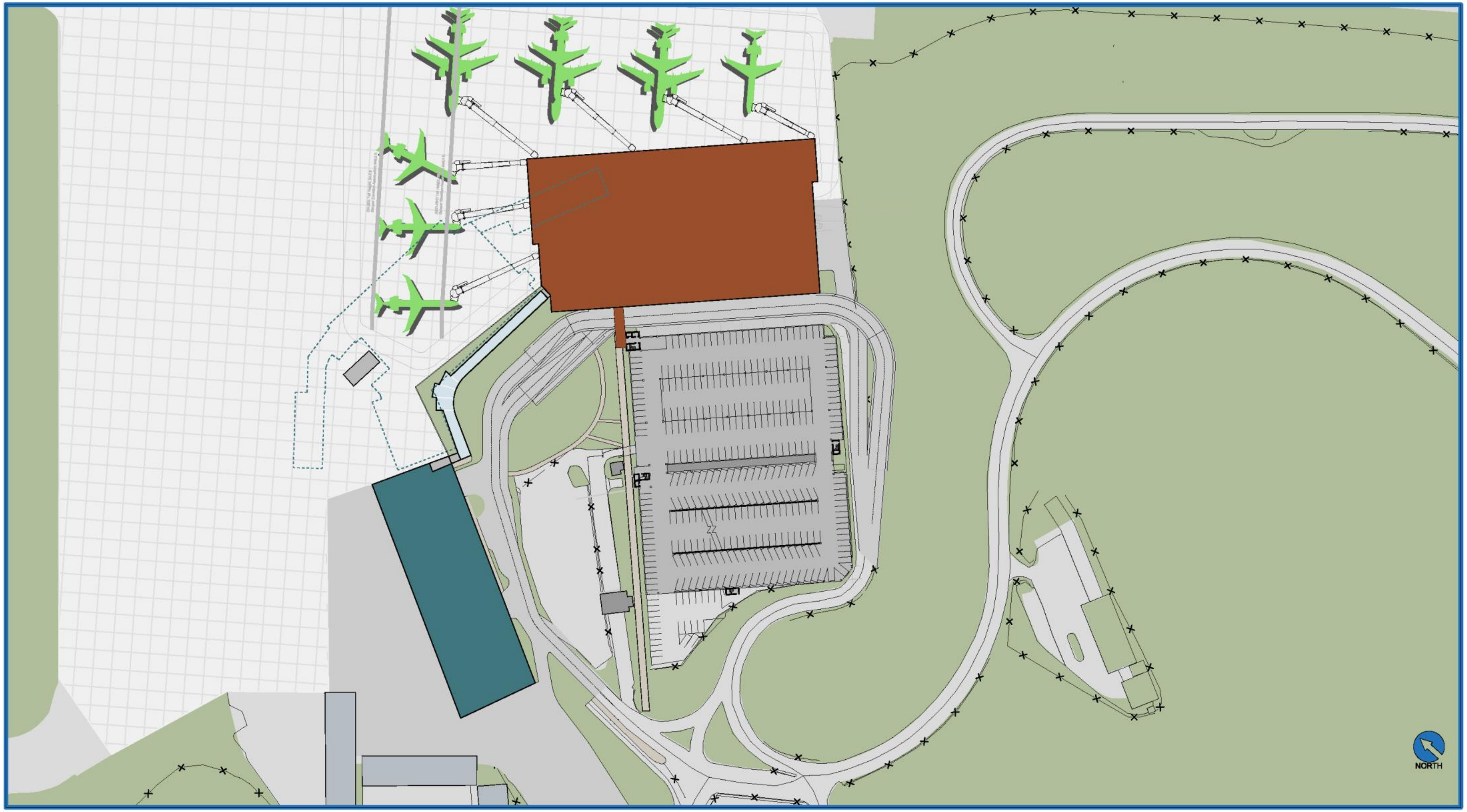
# Concept 1C






# CRW
# Partial Site Plan - Two Level Curb 1C

File: 2 Crub Rec - Partial Site - V2.dwg Layout: PS Last Saved: 1/26/2022 5:03 PM Plotted On: 1/26/2022 5:16 PM

Scale: 1/128"=1'-0"

Source:
Prepared by: Landrum & Brown

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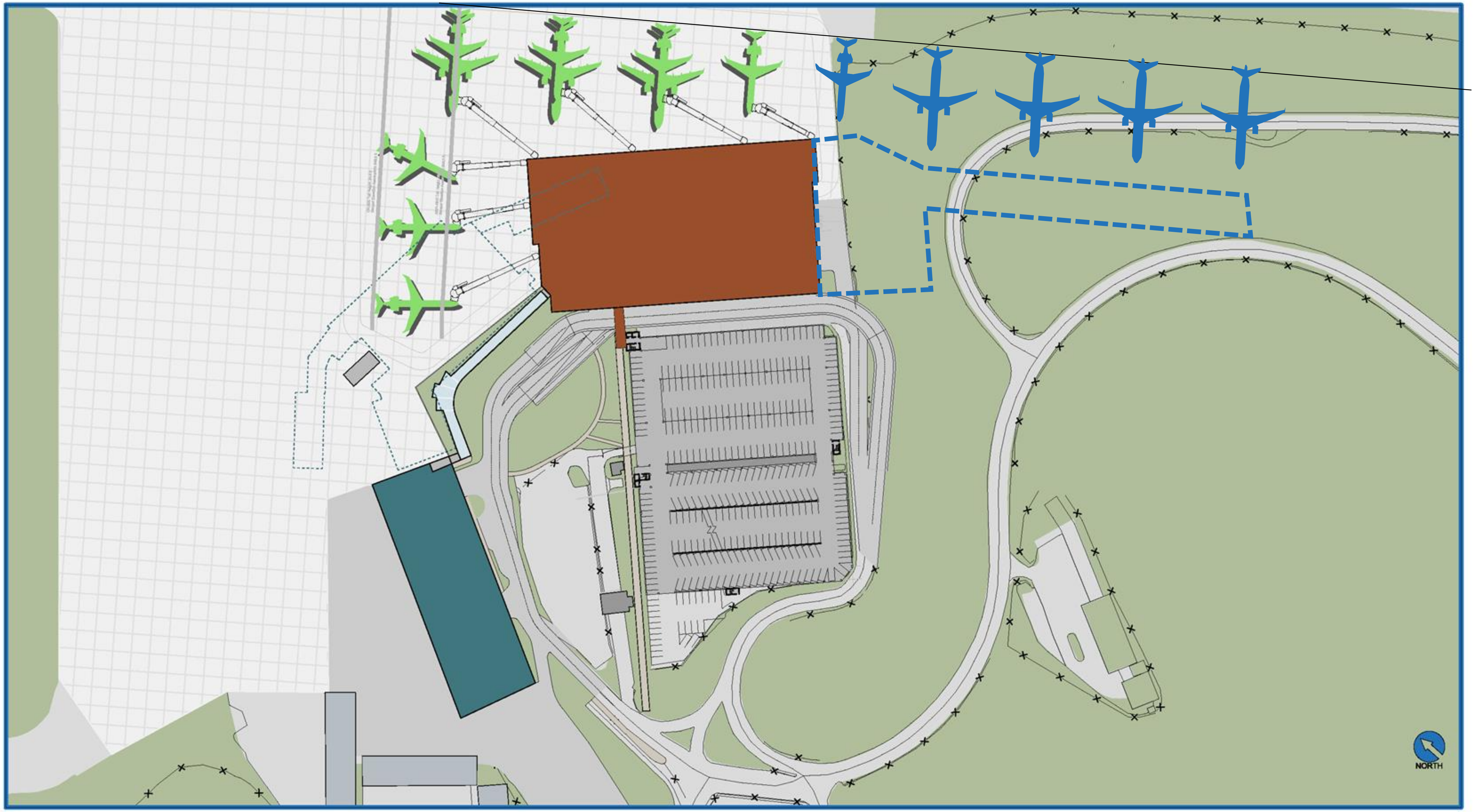

# CRW
# Partial Site Plan - Two Level Curb 1C

File: 2 Crub Rec - Partial Site - V2.dwg Layout: PS Last Saved: 1/26/2022 5:03 PM Plotted On: 1/26/2022 5:16 PM

Scale: 1/128"=1'-0"

Source:
Prepared by: Landrum & Brown

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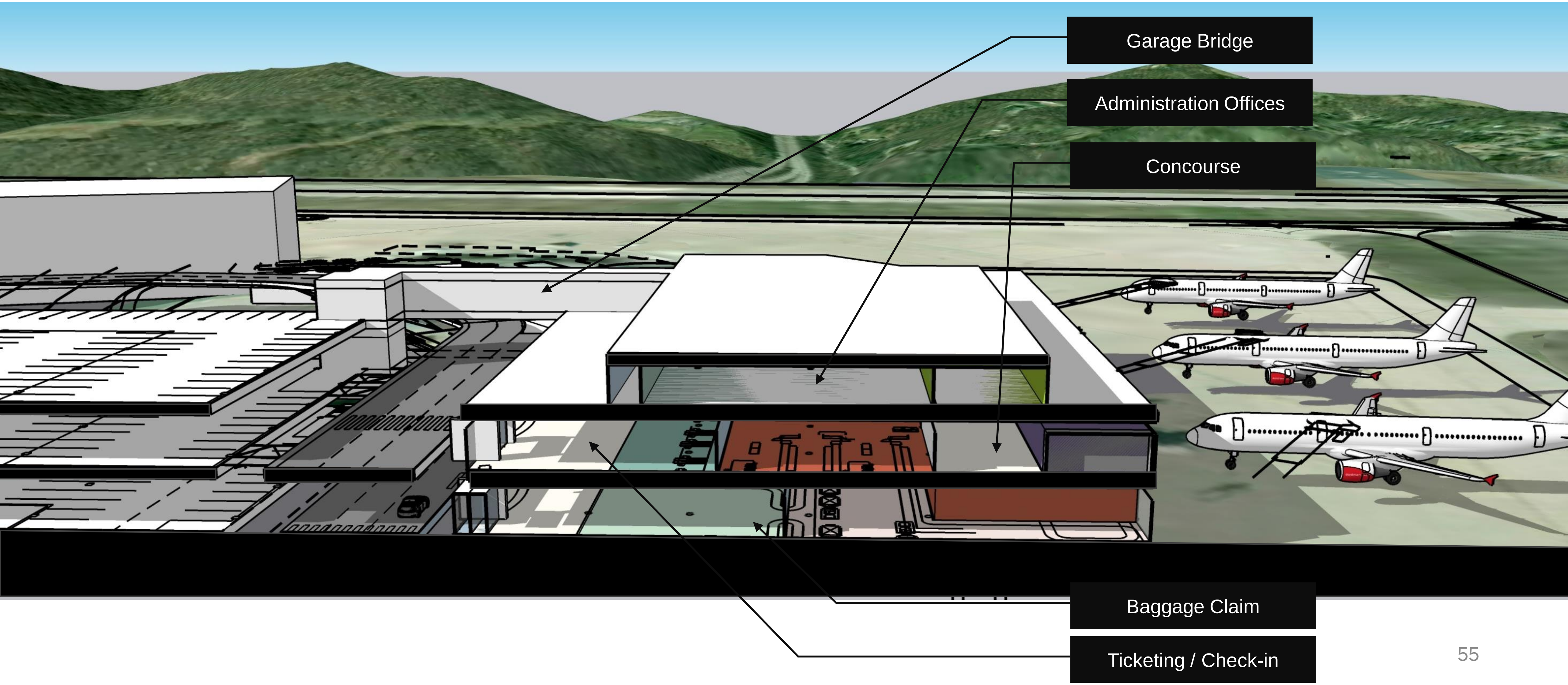
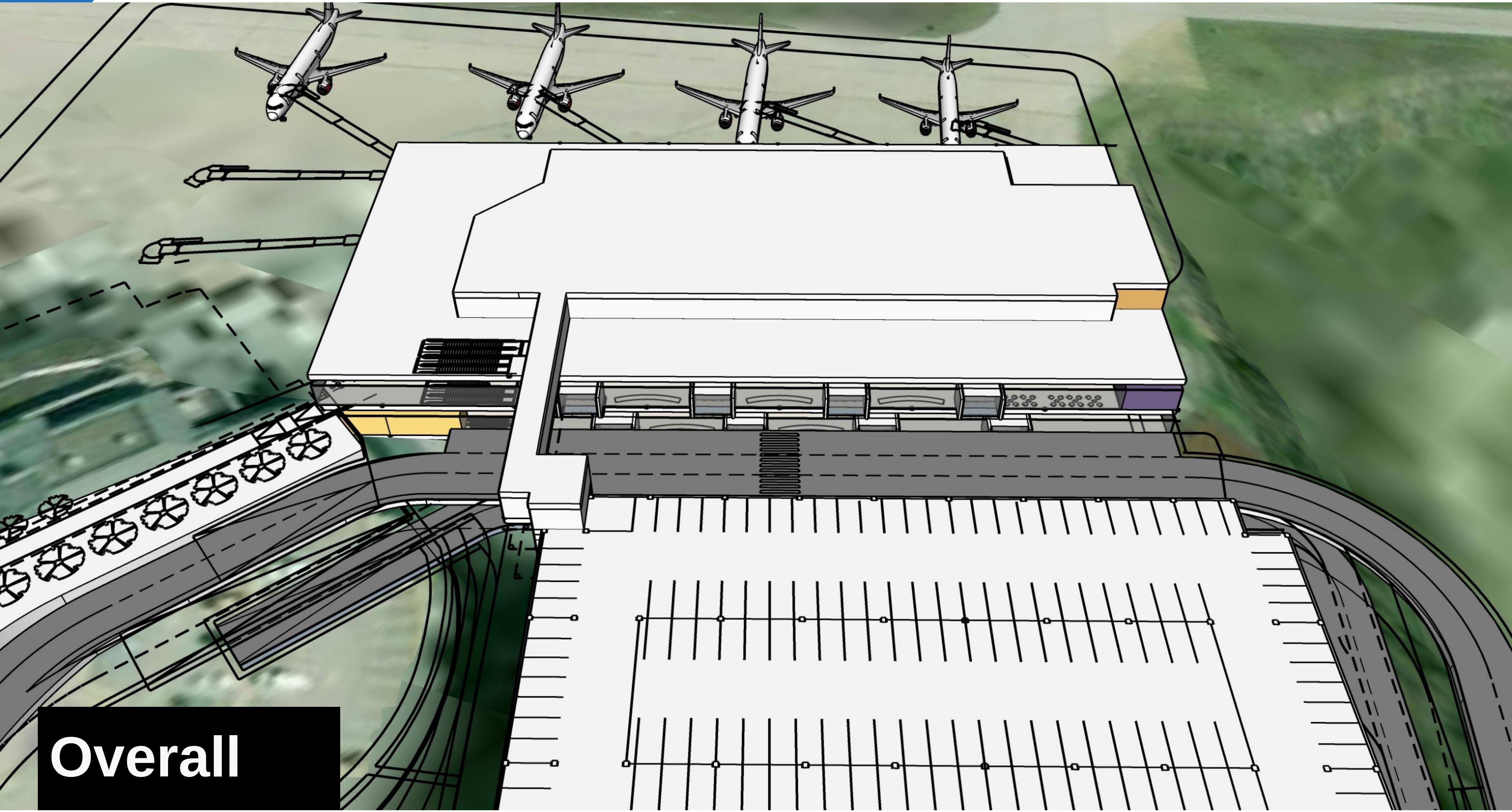
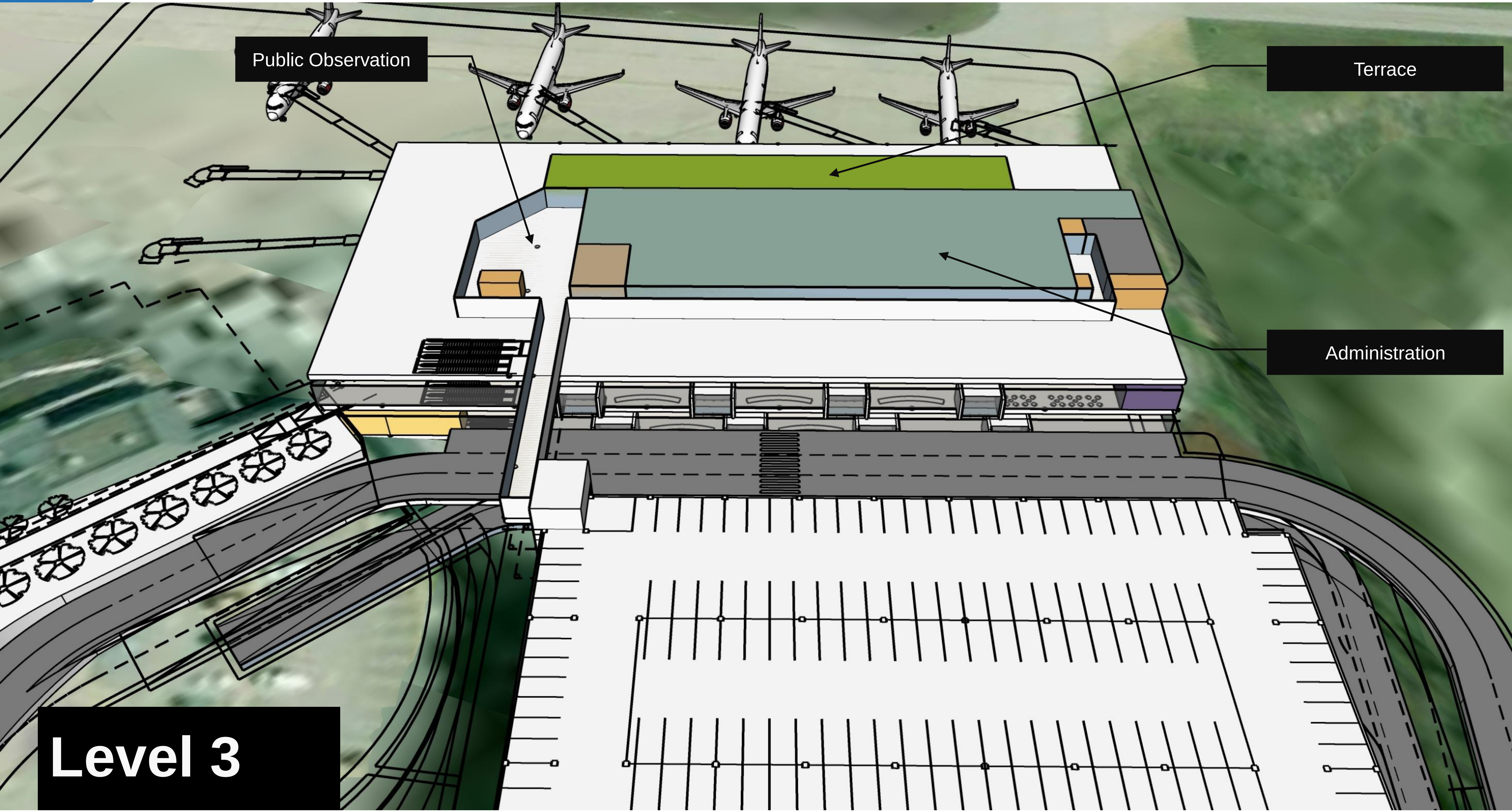
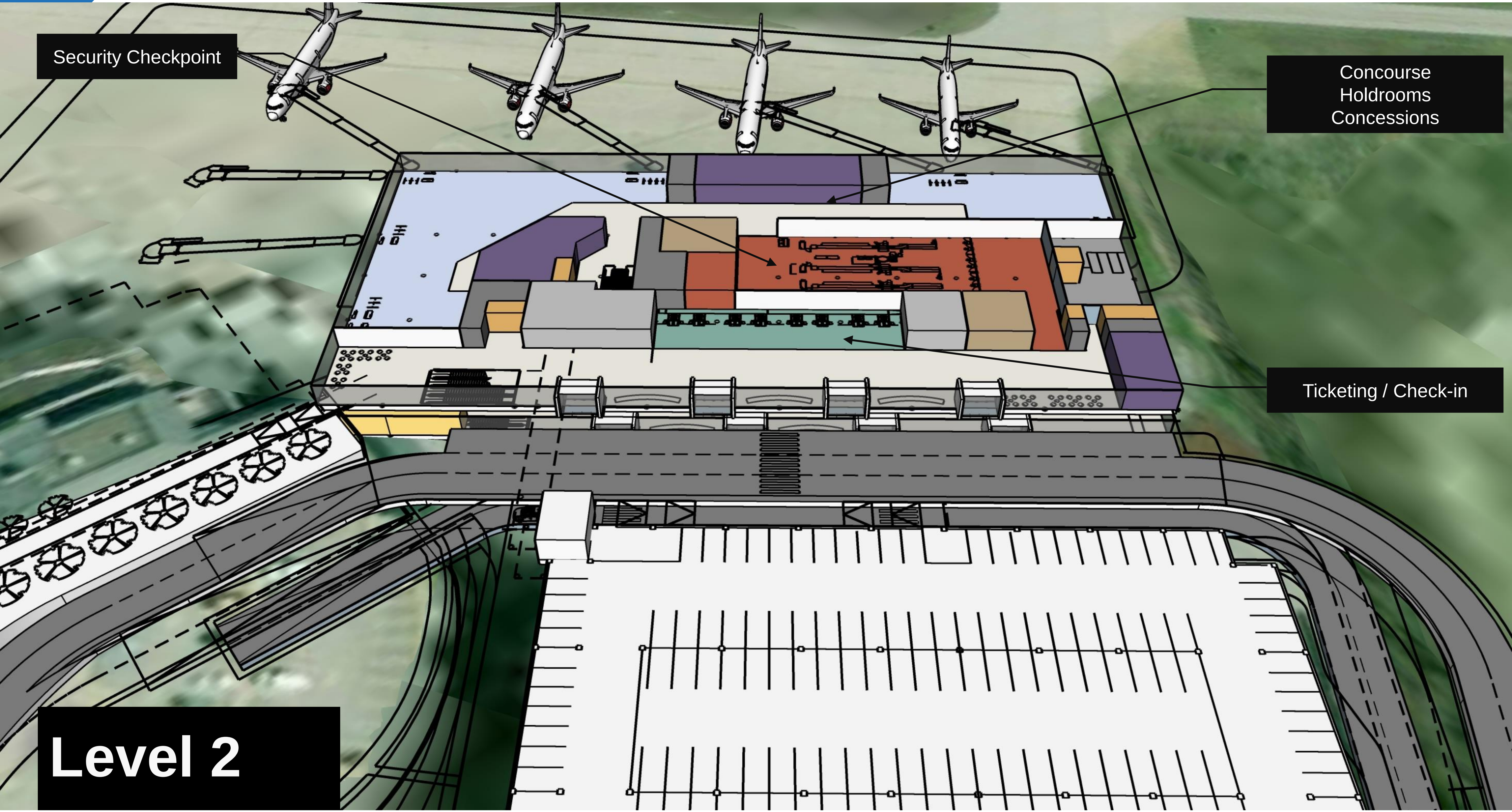
# Concept 1C Section

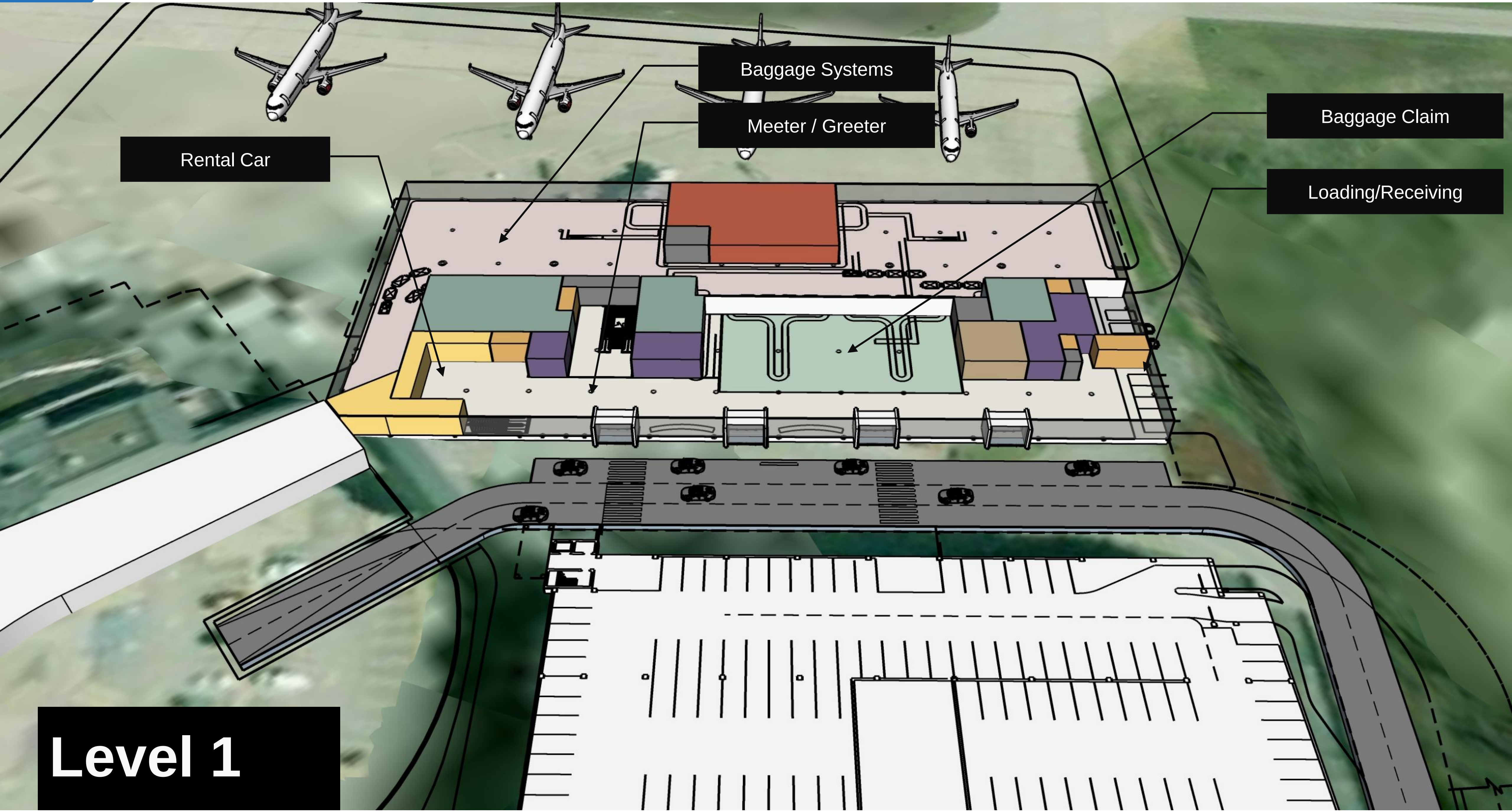




Overall

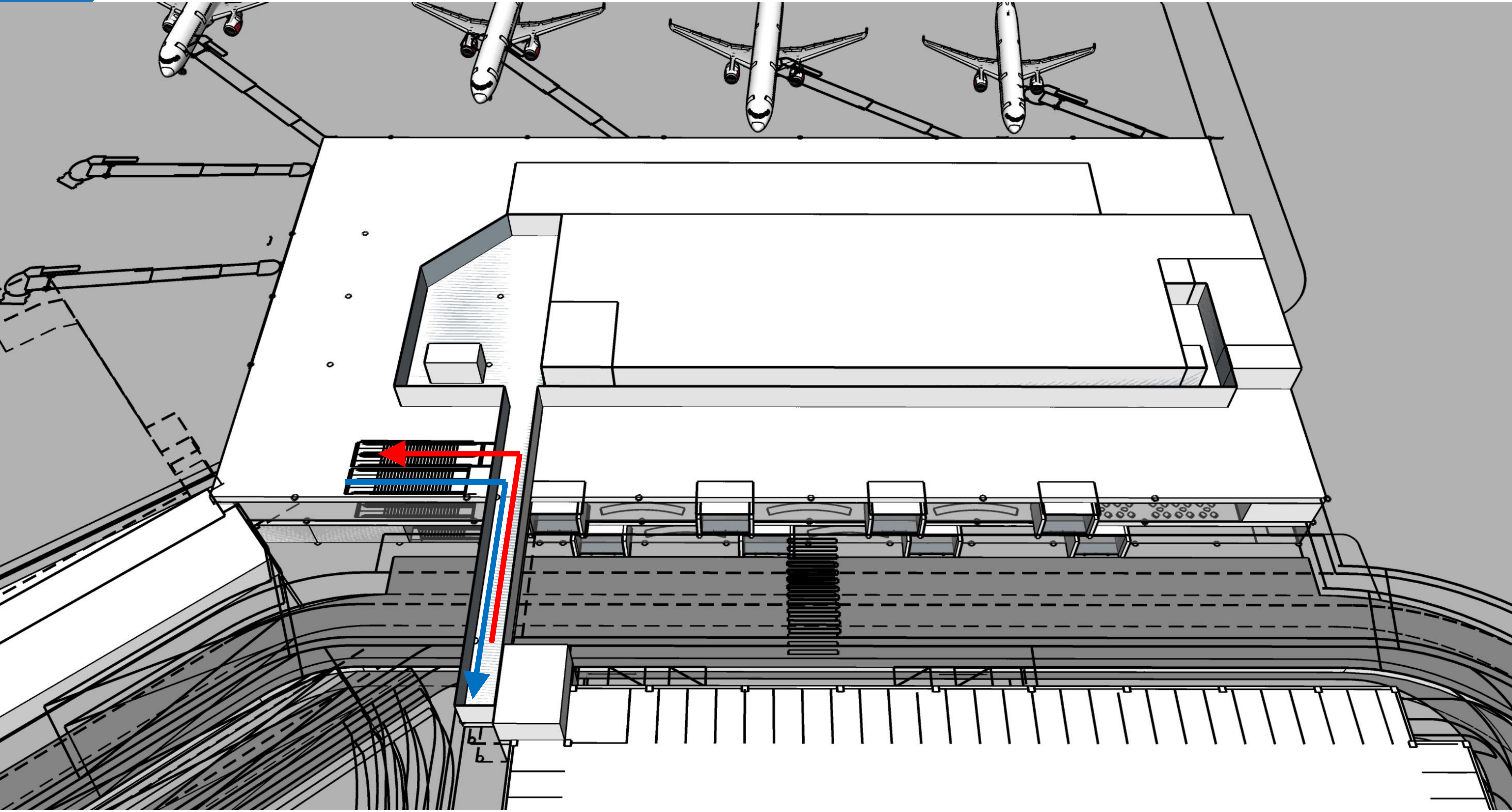

Public Observation
Terrace
Administration
Level 3

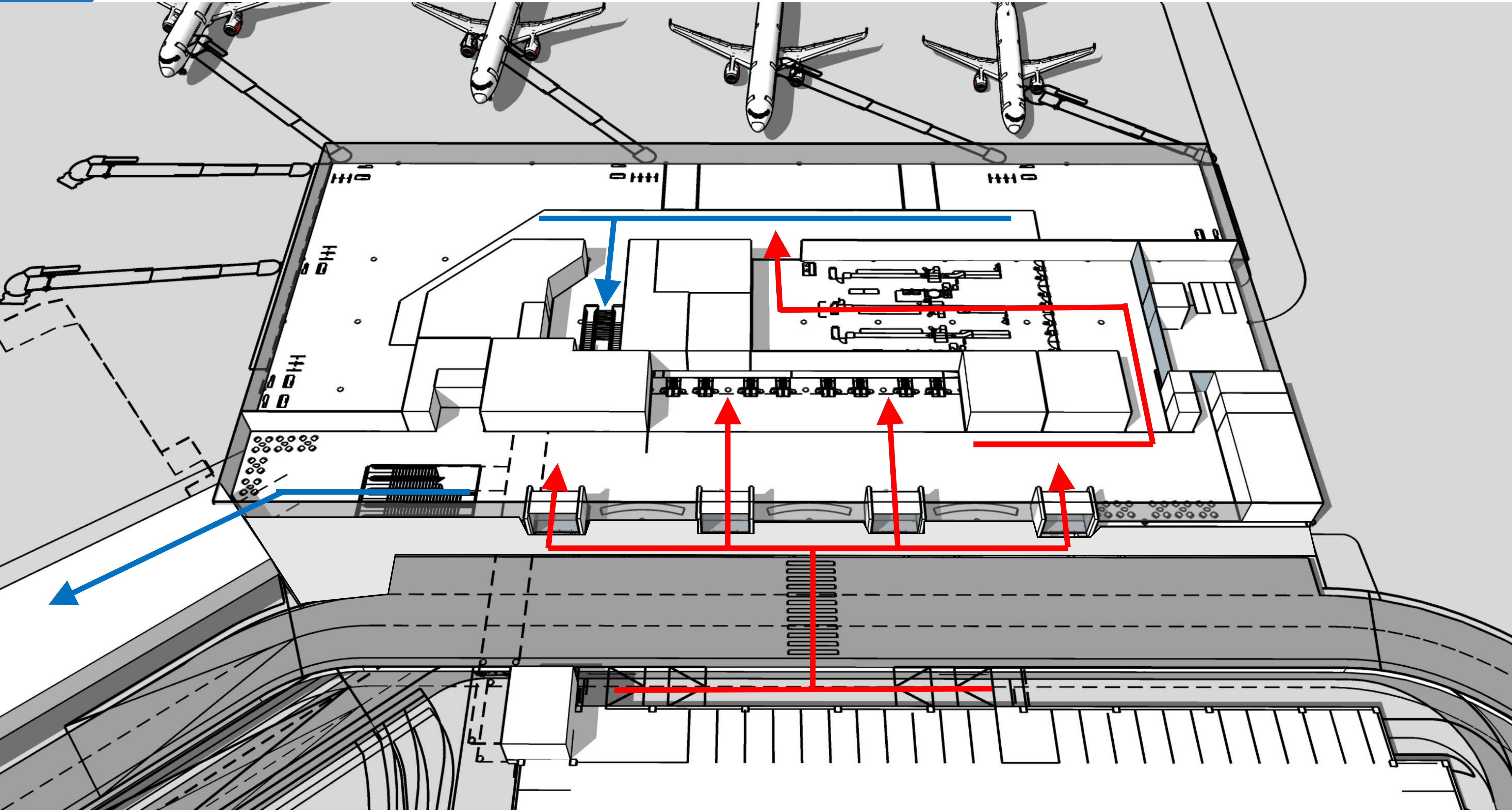

Security Checkpoint
Concourse
Holdrooms
Concessions
Ticketing / Check-in
Level 2

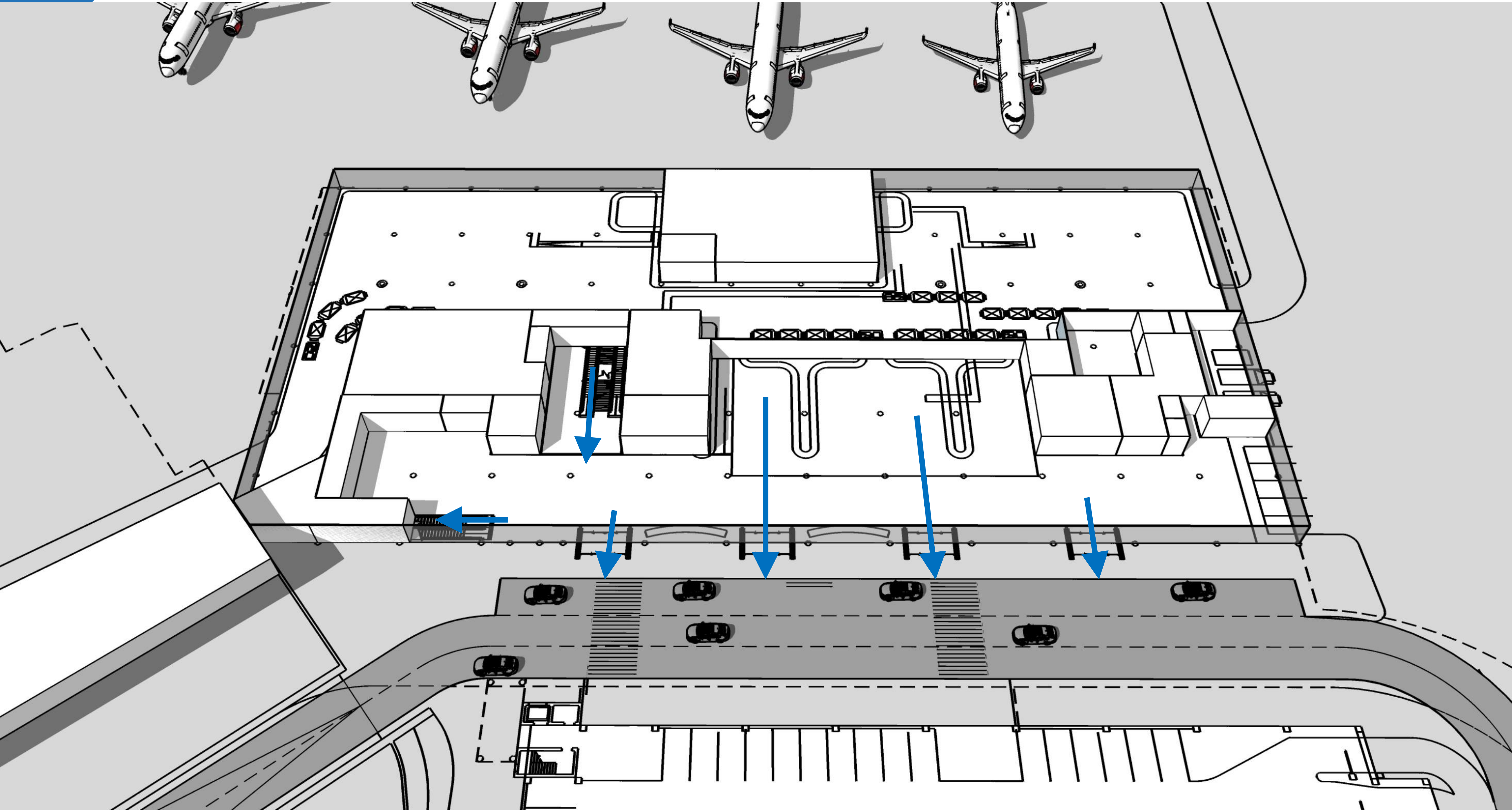


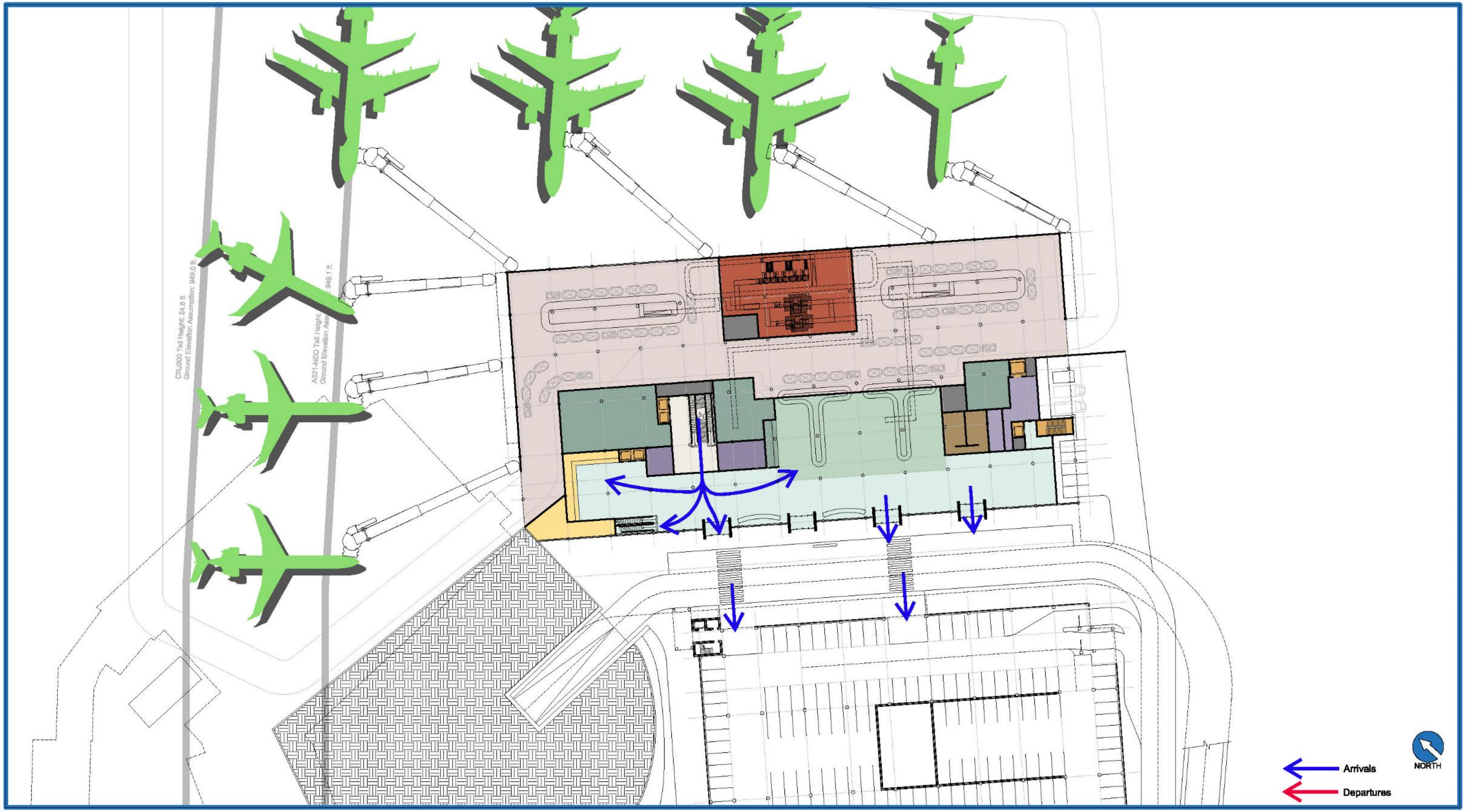
Baggage Systems
Meeter / Greeter
Baggage Claim
Rental Car
Loading/Receiving


# Level 1










## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Check-In
- Concession Support
- Loading Dock
- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

# CRW
# First Floor Alternative 1C

File: 2 Crub Rec - L1 - V1.dwg Layout: L1 Last Saved: 1/26/2022 11:41 AM Plotted On: 1/26/2022 12:01 PM

Scale: 1/64"=1'-0"

Source:
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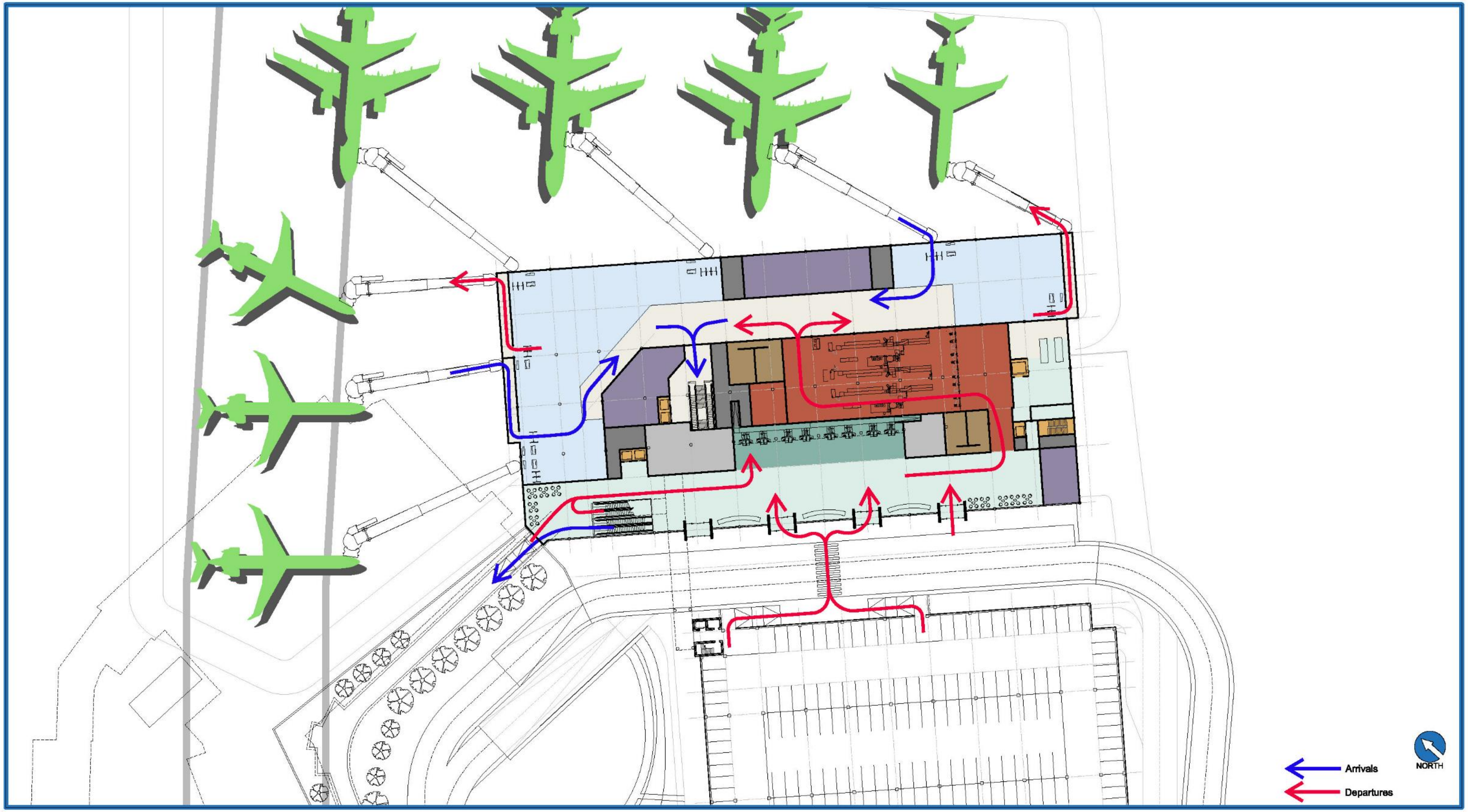


## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
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- Concession Support
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- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

# CRW
# Second Floor Alternative 1C

File: 2 Crub Rec - L2 - V1.dwg Layout: L2 Last Saved: 1/26/2022 11:42 AM Plotted On: 1/26/2022 11:48 AM

Scale: 1/64"=1'-0"

Source:
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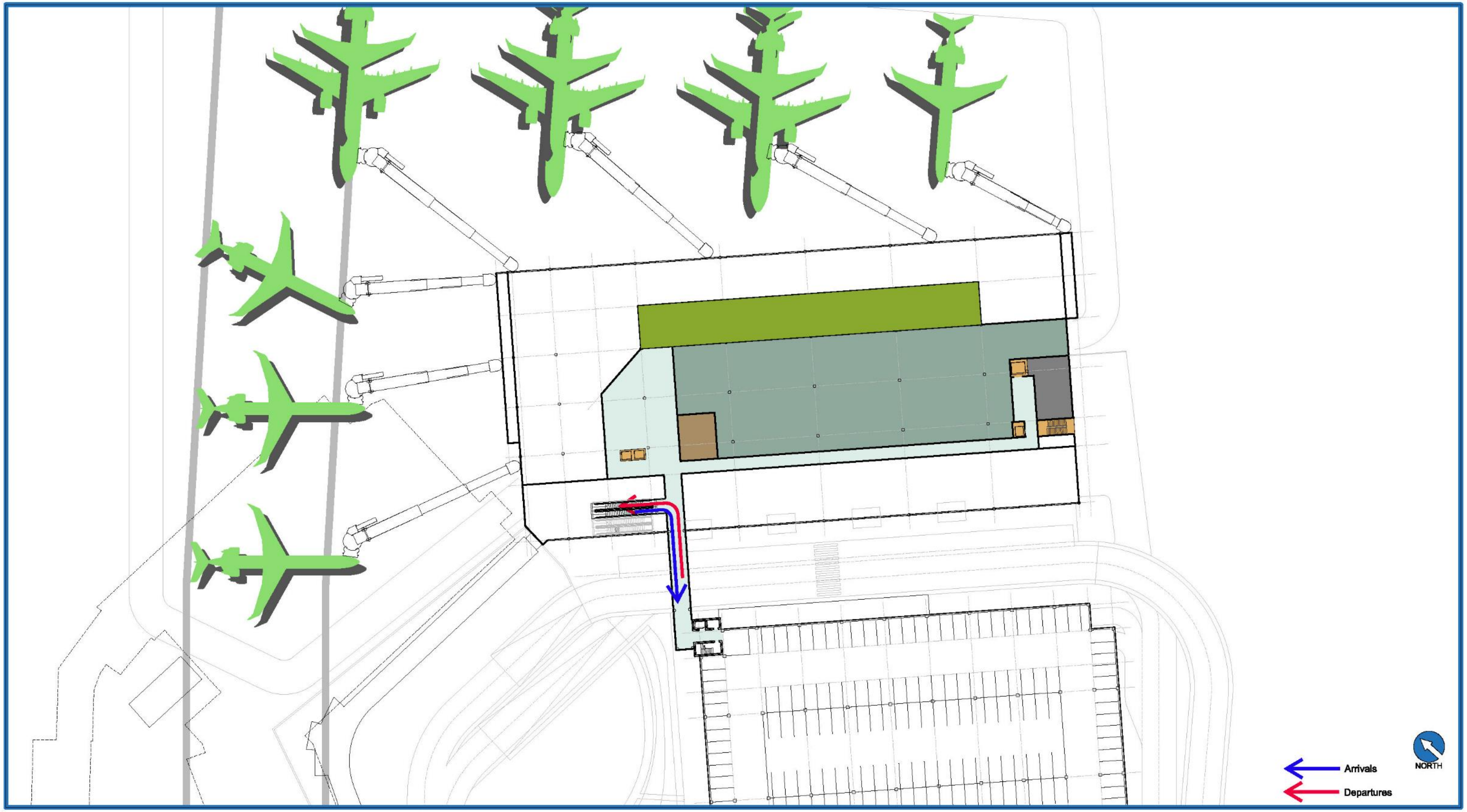


## Legend

- Restrooms
- Airport Operations
- BSO
- Checkpoint
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
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- Support or MEP
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- Concession Support
- Loading Dock
- Inbound Baggage
- Baggage Make Up
- Claim Area
- FIS
- Airline Operations
- ATO
- Amenities
- Vacant

**CRW**
**Second Floor Alternative 1C**

File: 2 Crub Rec - L3 - V1.dwg Layout: L2 Last Saved: 1/28/2022 11:40 AM Plotted On: 1/28/2022 12:03 PM

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown
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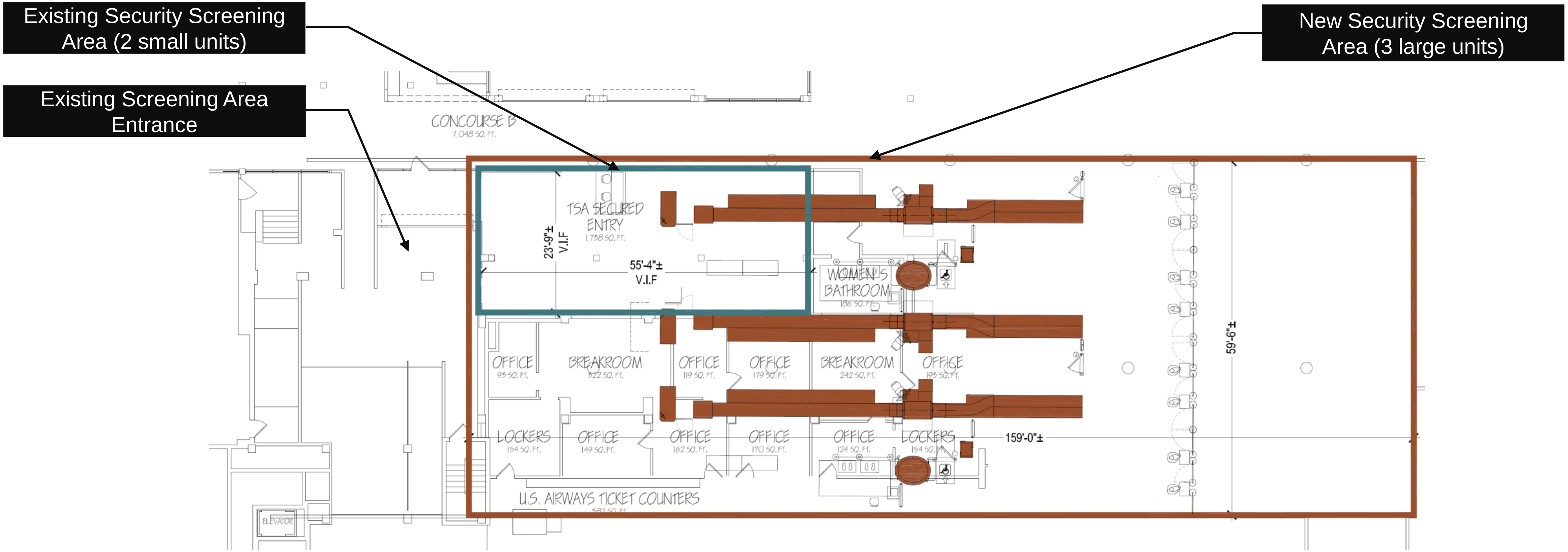
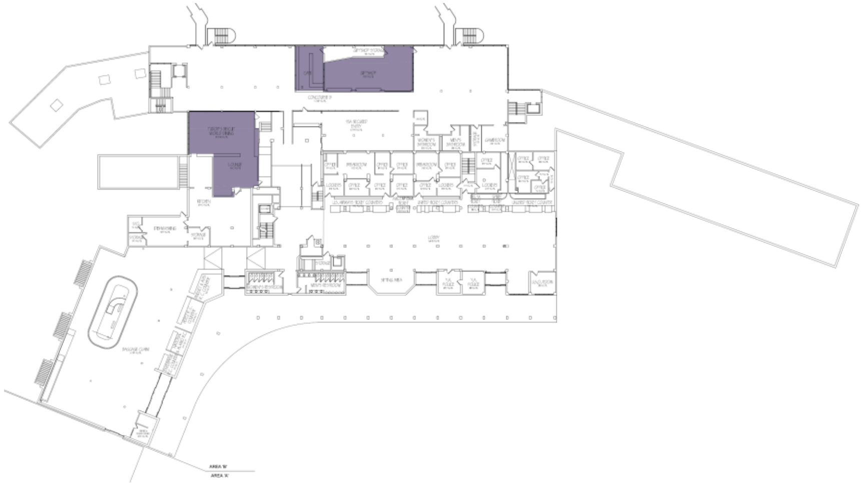
# Security Screening Comparison Existing vs New

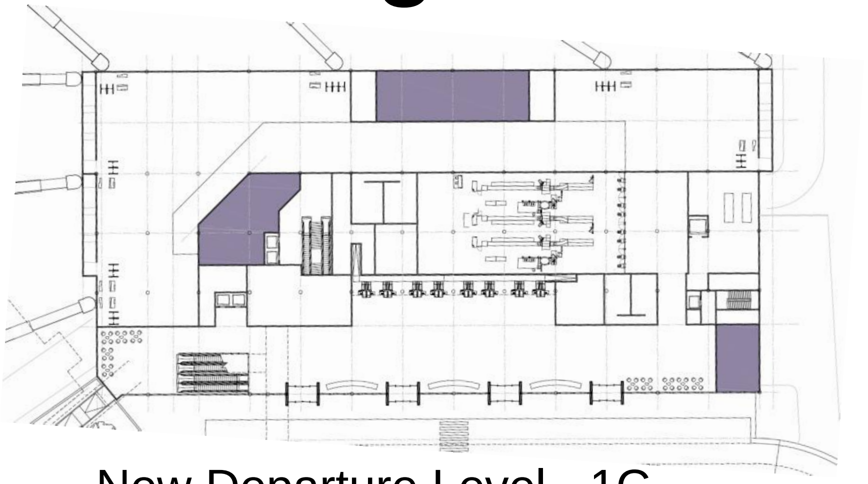



- Program Requirement = 2 units
- Third unit can be added with increased demand or at opening for higher level of service

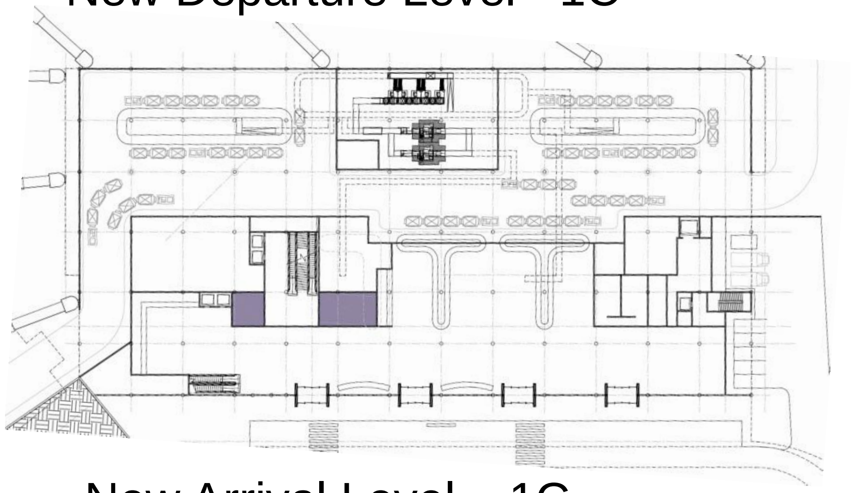
# Concessions Comparison Existing vs New



Existing Curb Level



New Departure Level - 1C



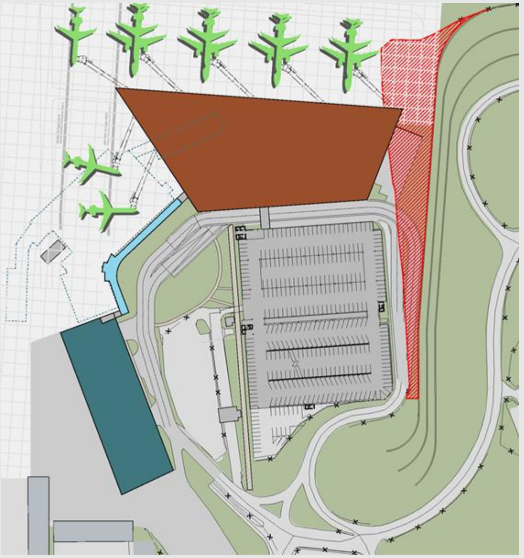
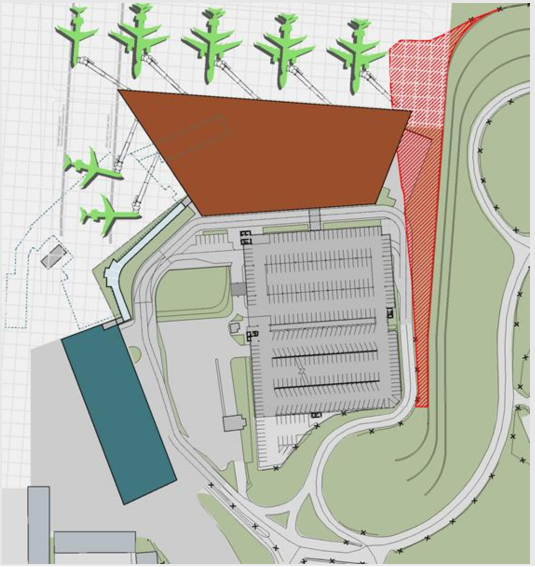
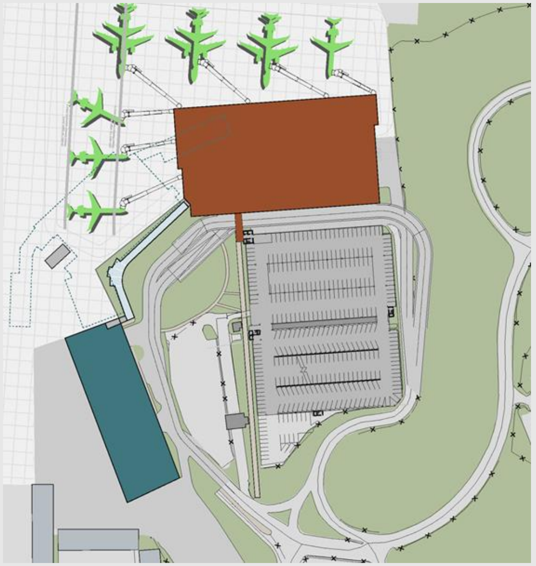
New Arrival Level – 1C

| Space Designation | Existing | | Program 2037 High | | Option 1A | | Option 1B | | Option 1C | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Unit | SF | Unit | SF | Unit | SF | Unit | SF | Unit | SF |
| Concessions | | 4,434 | | 6,260 | | 10,909 | | 10,852 | | 6,736 |

# Area Summary

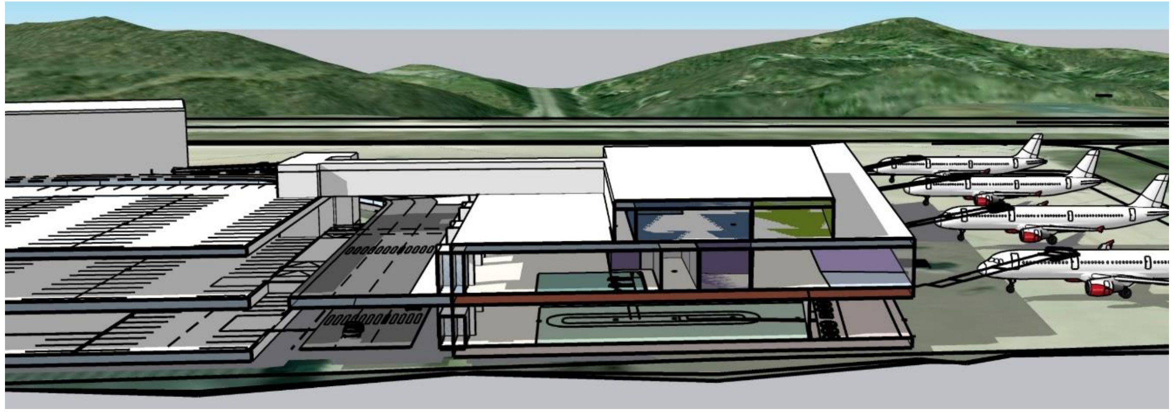
| Space Designation | Existing | | Program 2037 High | | Option 1A | | Option 1B | | Option 1C | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Unit | SF | Unit | SF | Unit | SF | Unit | SF | Unit | SF |
| Check-in | 16 | 5,074 | 12 | 4,010 | 16 | 4,757 | 16 | 4,760 | 16 | 3,643 |
| Airline Offices | | 3,297 | | 1,050 | | 1,794 | | 3,021 | | 2,769 |
| Baggage Make-up / Drop-off | | 5,263 | | 26,360 | | 31,906 | | 33,210 | | 32,533 |
| CBIS/CBRA Checked Bag Screening | | 1,938 | | 7,200 | | 3,122 | | 2,832 | | 5,003 |
| Baggage Claim | 1 | 3,873 | | 8,450 | 2 | 11,345 | 2 | 8,653 | 2 | 6,820 |
| Holdrooms | | 14,410 | | 13,800 | | 19,868 | | 19,868 | | 17,784 |
| Business Lounge | | | | 5,220 | | | | | | |
| Airline Operations | | 1,166 | | 7,760 | | 7,506 | | 6,812 | | 5,925 |
| Non-Secure Circulation / Lobbies | | 13,497 | | 8,414 | | 44,012 | | 33,409 | | 38,832 |
| Secured Circulation | | 3,486 | | 29,187 | | 12,499 | | 10,683 | | 12,982 |
| Restrooms | | 3,592 | | 5,750 | | 3,421 | | 1,896 | | 3,775 |
| Security Screening Check Point | 2 | 1,813 | 2 | 5,400 | 3 | 9,170 | 3 | 10,811 | 3 | 9,962 |
| TSA Offices | | 2,391 | | 920 | | 3,820 | | 1,676 | | 723 |
| Concessions | | 4,434 | | 6,260 | | 10,909 | | 10,852 | | 6,736 |
| Airport Operations / Administration | | 11,233 | | 11,733 | | 9,000 | | 14,528 | | 19,183 |
| Tenant Spaces | | 13,451 | | | | 2,585 | | 763 | | 1,605 |
| Vertical Circulation | | 4,568 | | 4,060 | | 2,137 | | 2,379 | | 2,213 |
| MEP/Support | | 5,689 | | 16,210 | | 5,648 | | 4,314 | | 5,129 |
| Loading Dock | | | | 750 | | 3,435 | | 2,752 | | 1,099 |
| **Total Areas** | | **99,175** | | **162,534** | | **186,934** | | **173,218** | | **176,717** |
| Terrace | | | | | | 7,139 | | 5,351 | | 7,065 |

# Summary Matrix

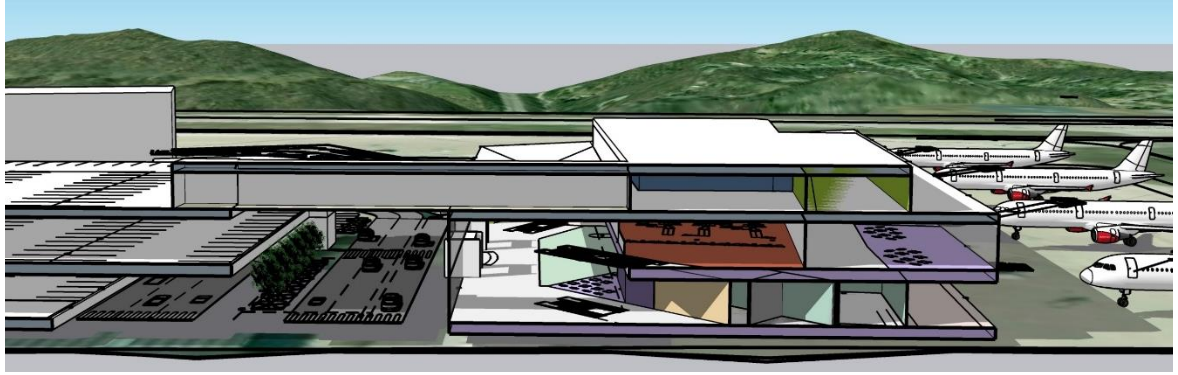
| | Alternative 1A (2 level) | Alternative 1B (1 level) | Alternative 1C (2 level) |
|---|---|---|---|
| |  |  |  |
| **Pros** | • No level change for departing passengers<br>• More narrowbody gate positions | • Lower cost due to single level curb<br>• More narrowbody gate positions | • No level change for departing passengers<br>• Rectangular building will have lower cost<br>• No fill required |
| **Cons** | • Higher cost due to two level curb<br>• Requires fill | • Departing and arriving passengers must change levels<br>• Requires fill | • Higher cost due to two level curb<br>• Fewest narrowbody gate positions |

# Alternatives

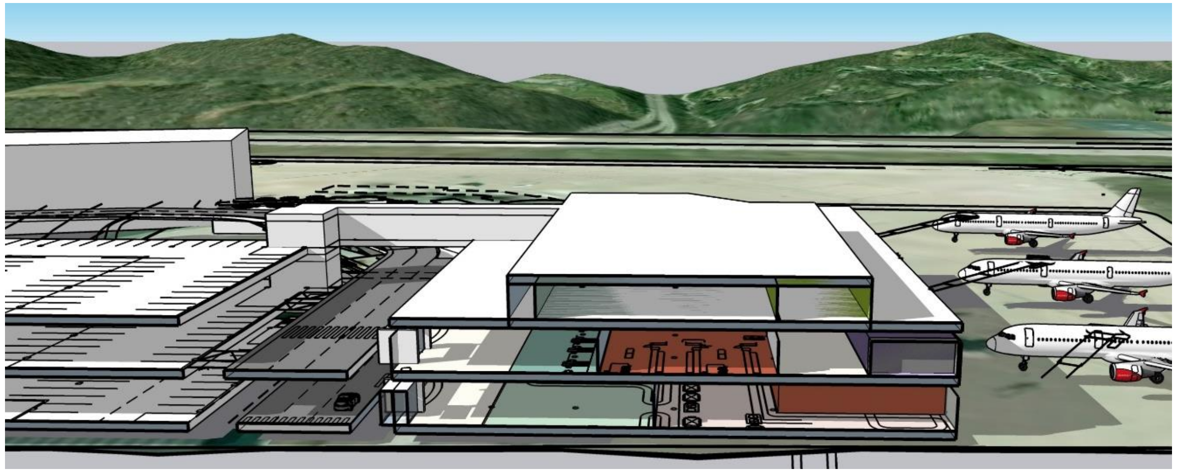
**Option 1a**
Two level curb



**Option 1b**
One level curb
Use Ex. Garage



**Option 1c**
Two level curb



# Key Decisions

1. Develop a 1 level or 2 level curbside roadway
2. Construct a bridge to connect from the garage to the terminal
3. Include fill to maximize narrowbody gate positions
4. Maximize building envelope (Options 1a or 1b) or provide optimized terminal (Option 1c)

# Next Steps

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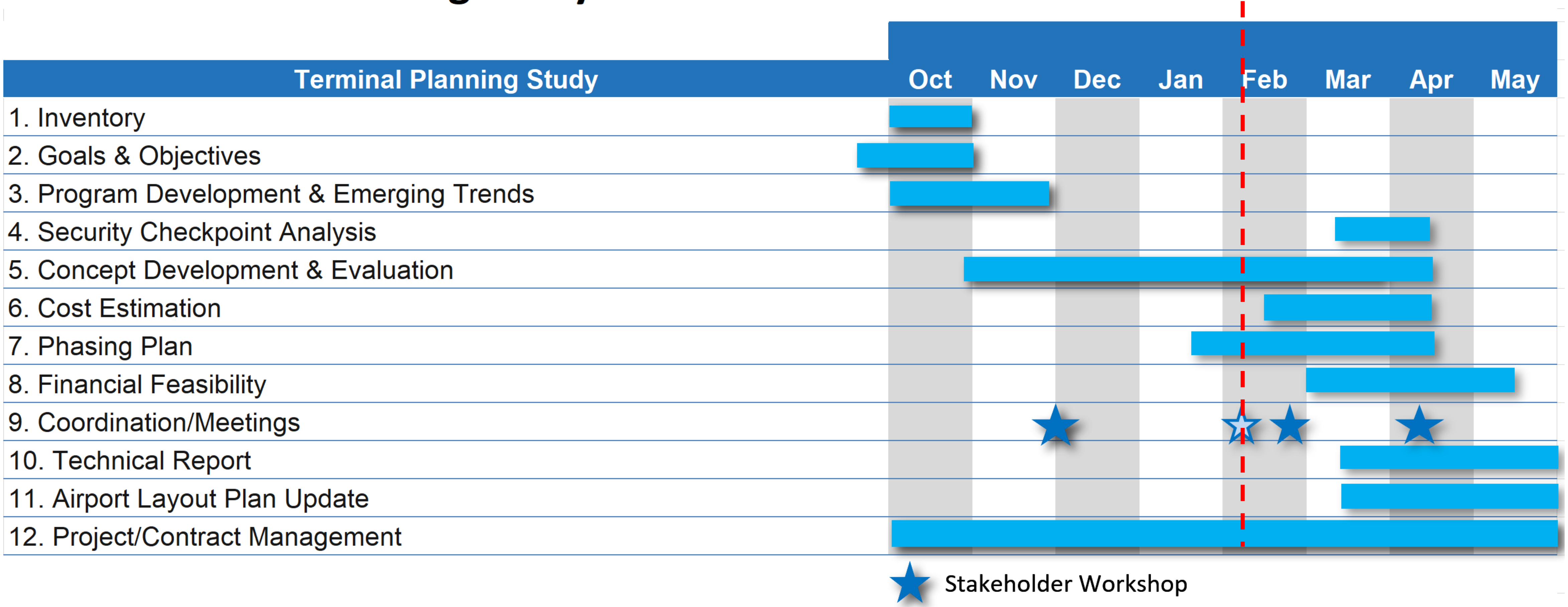
# Next Steps

## CRW Terminal Planning Study



# Next Steps

1. February 23 Workshop (in-person at Yeager)
   - Concept Refinement – Terminal, Airside, Landside
   - Initial Cost Estimation
   - Phasing
   - Financial
2. Final Workshop (early April – TBD)

# TO 1401 – Terminal Planning Study
## Workshop 3

Landrum & Brown | February 23, 2022

YEAGER AIRPORT

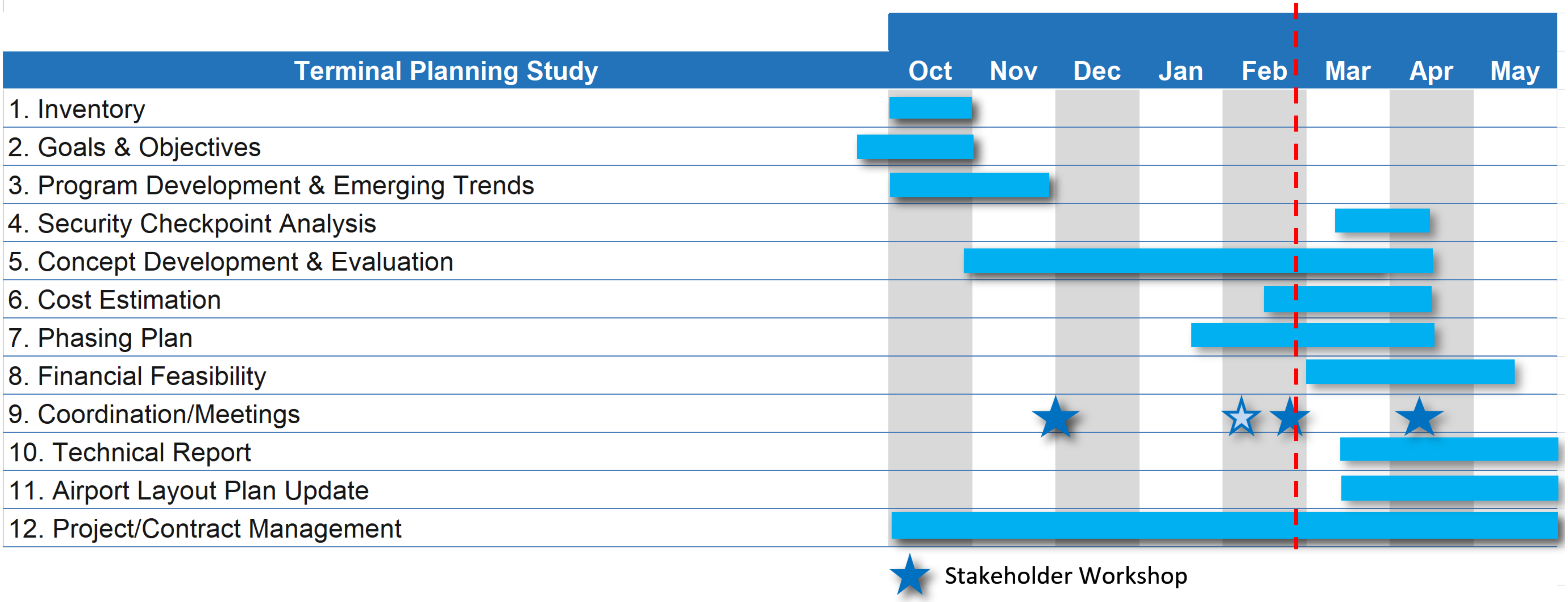
L&B

# Agenda

- Project Schedule
- Overview/Refresher
- Initial Comparison Cost Analysis
- Concept 1A Refinement and Phasing
- Landside Considerations
- Intro to Advanced Air Mobility
- Air Traffic Control Tower
- Implementation (Environmental and Funding)
- Next Steps
- Short-term Section 163/ALP submittal

# Project Schedule

## CRW Terminal Planning Study



# Overview/Refresher

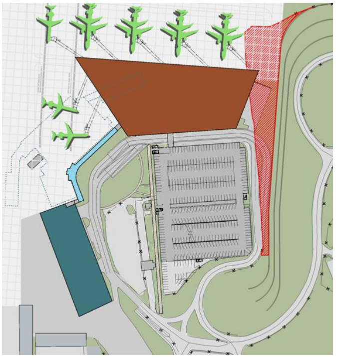
YEAGER AIRPORT

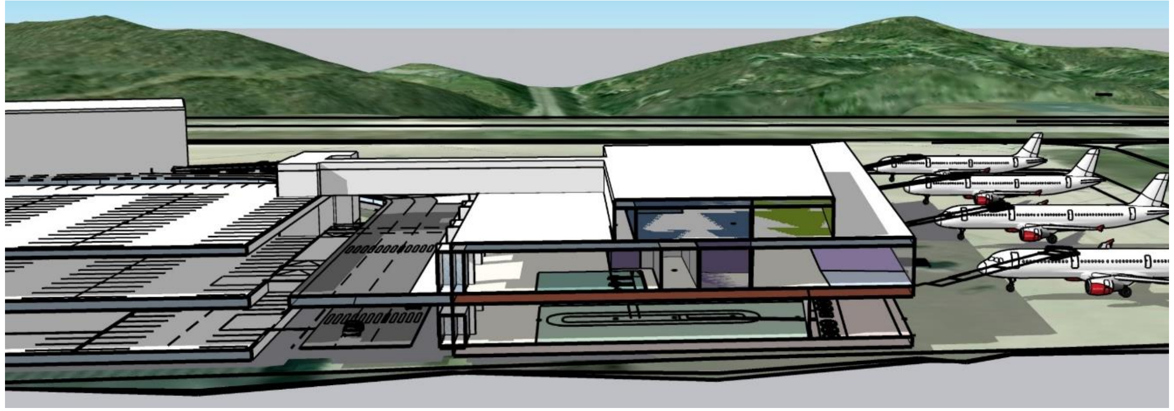
# Overview/Refresher

- Terminal Plan
  - **Selected Alternative 1A as the preferred option**
  - Move forward with two-level curbside roadway
  - Refine floorplans and phasing
- Phased Approach
  - Develop phasing approach that targets funding this fiscal year (list design projects that could start this year)
  - Can remove existing bridge to expedite the design process
- Other Considerations
  - Provide dedicated walkway to the future hotel
  - Identify potential locations for eVTOL operations
  - Existing high voltage for the solar panels along roadway is a constraint
  - Existing building must be torn down but ATCT is a constraint
  - Landside & commercial vehicle improvements

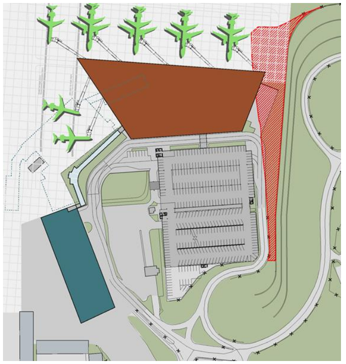
# Summary

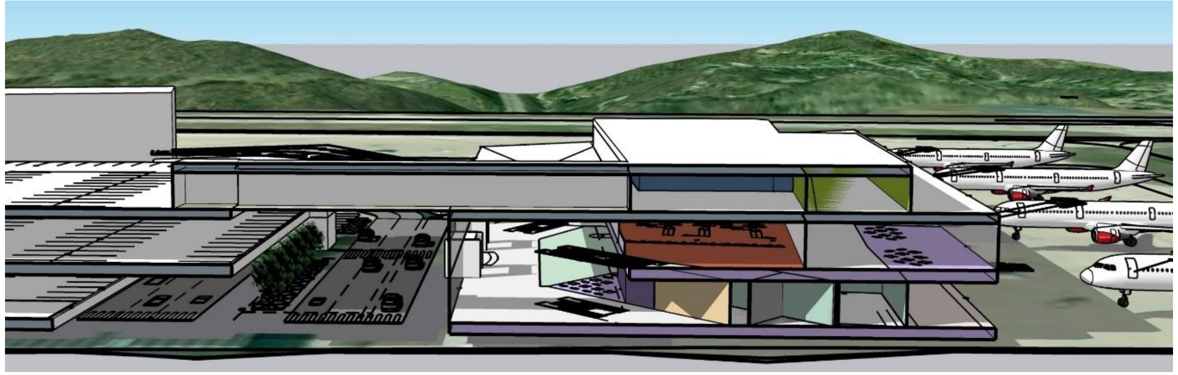
**Option 1a**
Two level curb



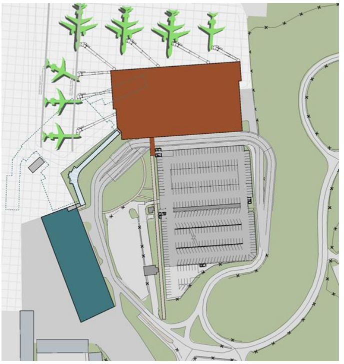


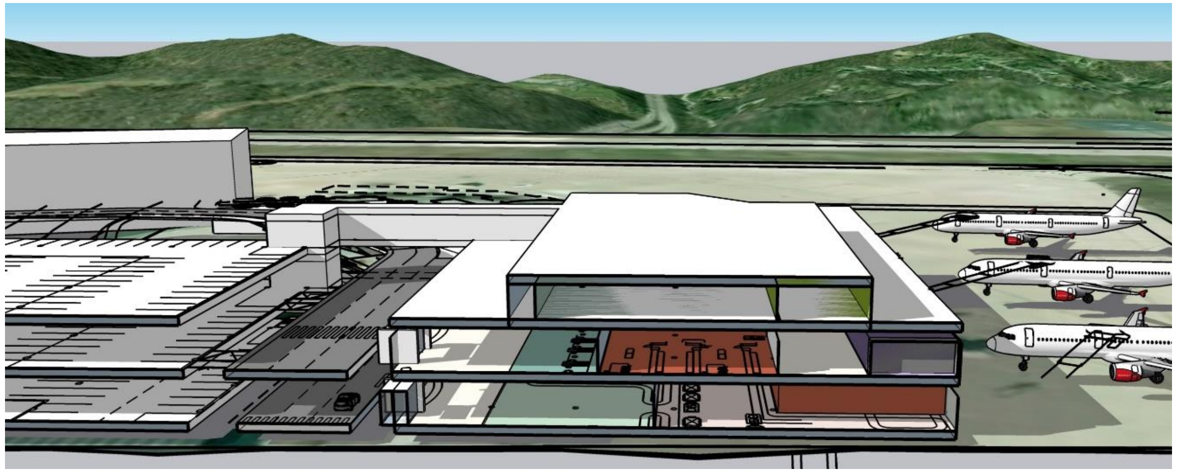
**Option 1b**
One level curb
Use ex. Garage



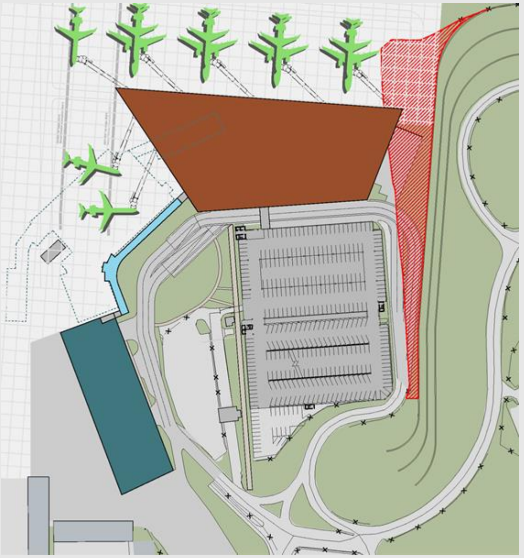
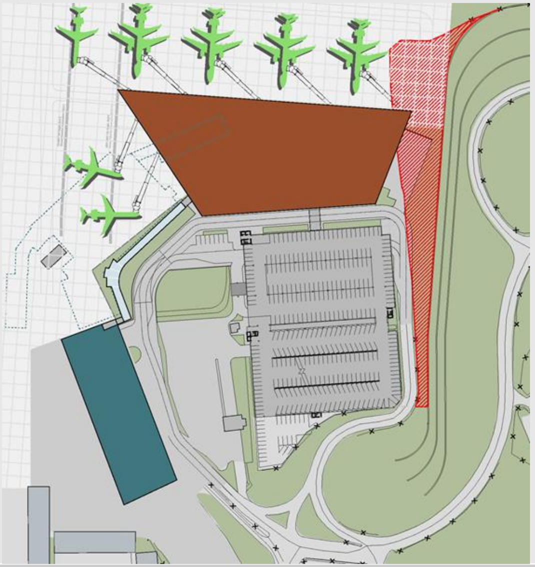
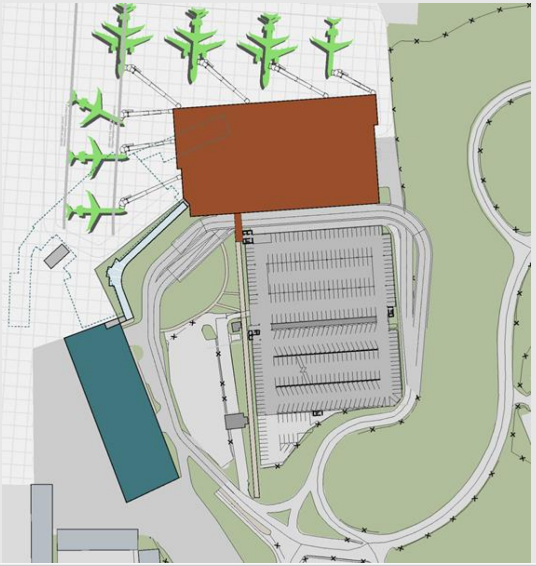


**Option 1c**
Two level curb





# Summary Matrix

| | Preferred Option: Alternative 1A (2 level) | Alternative 1B (1 level) | Alternative 1C (2 level) |
|---|---|---|---|
| |  |  |  |
| **Cost*** | $145-150m | $131-136m | $134-139m |
| **Pros** | • No level change for departing passengers<br>• More narrowbody gate positions | • Lower cost due to single level curb<br>• More narrowbody gate positions | • No level change for departing passengers<br>• Rectangular building will have lower cost<br>• No fill required |
| **Cons** | • Higher cost due to two level curb<br>• Requires fill | • Departing and arriving passengers must change levels<br>• Requires fill | • Higher cost due to two level curb<br>• Fewest narrowbody gate positions |



*Total program cost including construction and soft costs

# Initial Comparison Cost Estimate

# Initial Cost Summary

| DEVELOPMENT ALTERNATIVES | | CONSTRUCTION COST | PROGRAM COST |
|---|---|---|---|
| OPTION 1A | TERMINAL | $ 80.0 M | $ 121.0 M |
| | AIRSIDE | $ 7.5 M | $ 11.0 M |
| | LANDSIDE | $ 8.5 M | $13.0 M |
| | **TOTAL =** | **$ 95.0 M – $100.0 M** | **$ 145.0 M - $150.0 M** |
| OPTION 1B | TERMINAL | $ 75.0 M | $ 112.5 M |
| | AIRSIDE | $ 7.5 M | $ 11.0 M |
| | LANDSIDE | $ 5.5 M | $ 8.5 M |
| | **TOTAL =** | **$ 87.0 M - $92.0 M** | **$ 131.0 M – $136.0 M** |
| OPTION 1C | TERMINAL | $ 75.0 M | $ 113.5 M |
| | AIRSIDE | $ 5.5 M | $ 8.0 M |
| | LANDSIDE | $ 8.5 M | $13.0 M |
| | **TOTAL =** | **$ 88.0 M - $93.0 M** | **$ 134.0 M – $139.0 M** |

Note: Costs are for comparative purposes only. Costs do not include taxiway improvements or building demolition.

# Initial Cost Summary

Terminal

- Based upon S.F. area
- With Concept 1A refinement, the SF areas are decreasing
- Does not include existing building demolition

Landside

- 2 level curb is approx. $4.0M more than 1 level curb
- Further analysis on fill vs bridge piers for roadway loop will be reviewed in next steps
- Does not include modifications to garage entry/exit or short term lot yet

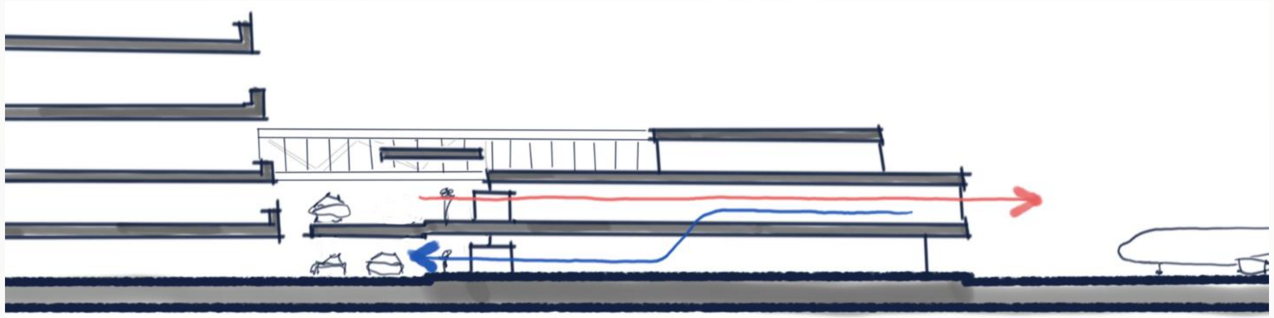
Airside

- Fill option for pavement is approx. $3.0 - $4.0M more than no fill
- Fill option provides the fifth aircraft position on new concourse. Can only accommodate four positions on existing flat area.
- Does not include taxiway improvements

Note:

- Initial cost estimation for comparison purposes only. Cost will be refined for next Workshop with the Concept 1A refinement.

# Concept 1A Refinement and Phasing



Two Level Curb

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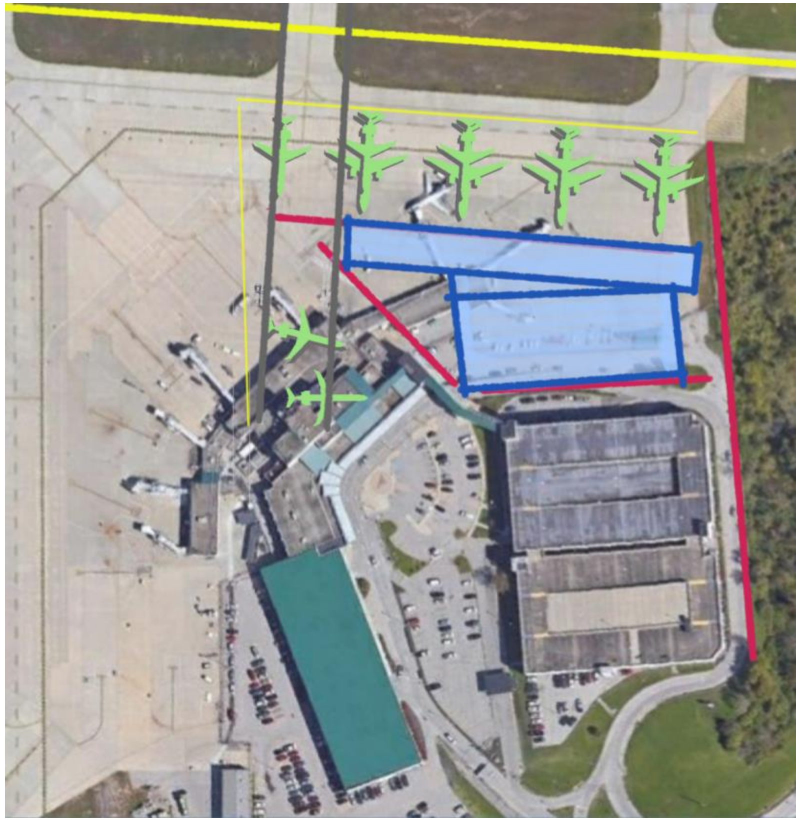
# Planning Process

## Evolve the High Level Concepts (1A) with Refinement

Maximum Envelope

*Option 1A last Workshop*
*Explore the possibilities*

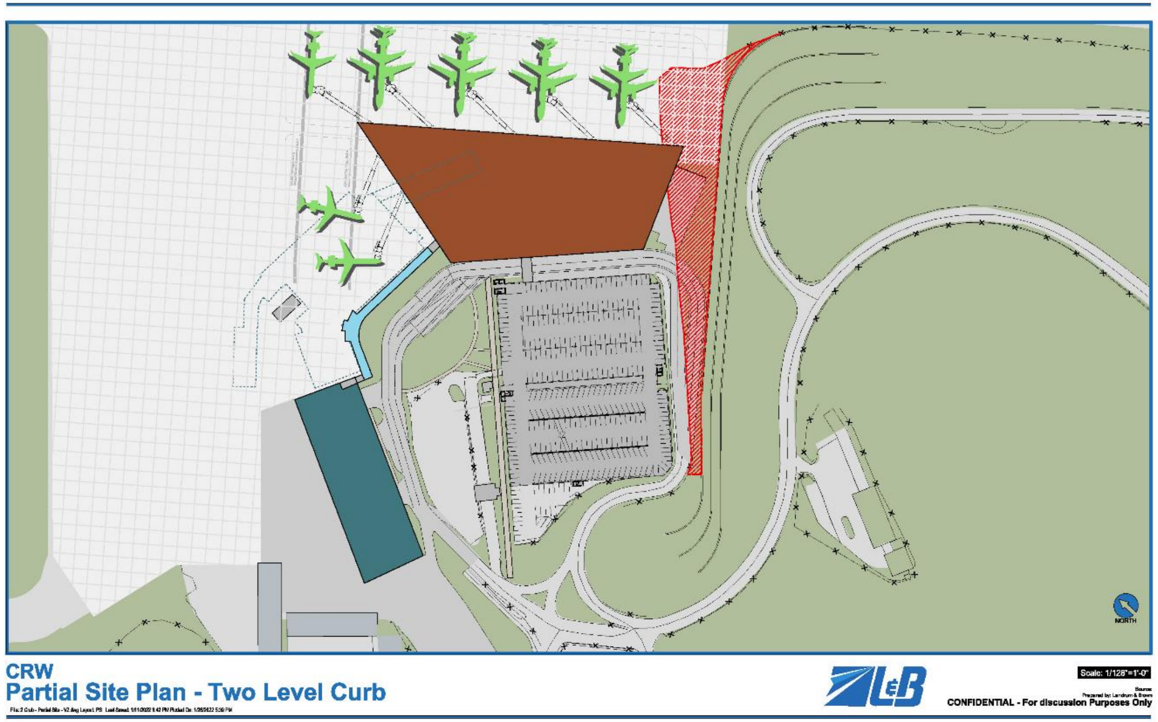


Optimized

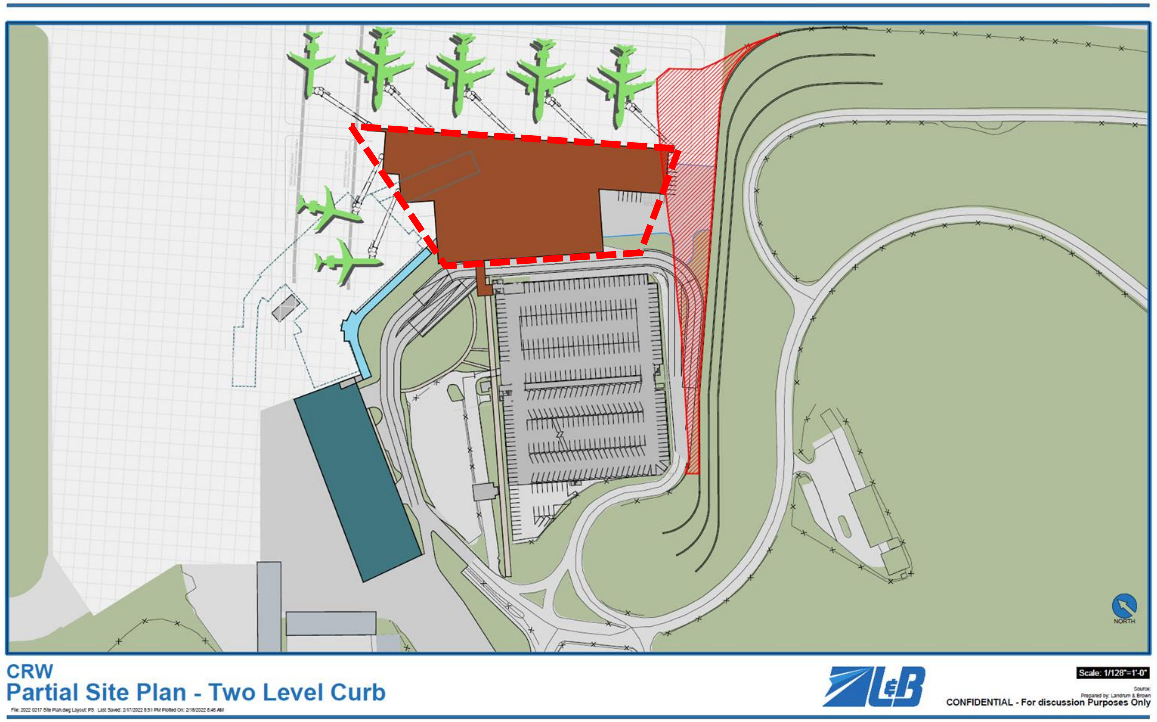
*Simplify construction, easy phasing, right-size building SF area*

# Concept 1A Building Footprint Optimization

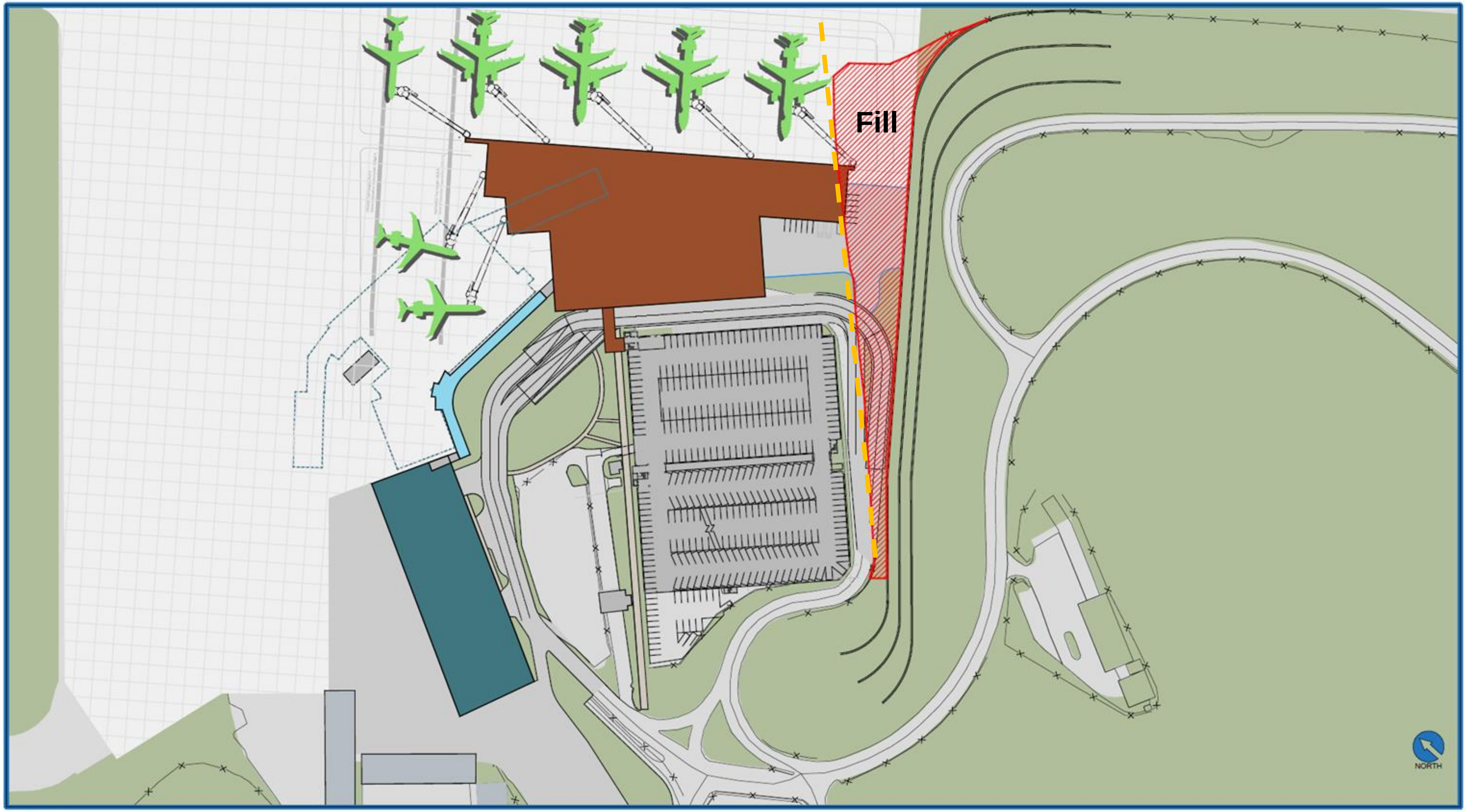
Original




Optimized




- Improved building layout to reduce cost
  - Removed excess program
  - Optimized building structural grid
  - Improved passenger flows and building functions




CRW

## Partial Site Plan - Two Level Curb

File: 2022 0217 Site Plan.dwg Layout: P5 Last Saved: 2/17/2022 8:51 PM Plotted On: 2/18/2022 8:46 AM

Scale: 1/128"=1'-0"

Source:

Prepared by: Landrum & Brown

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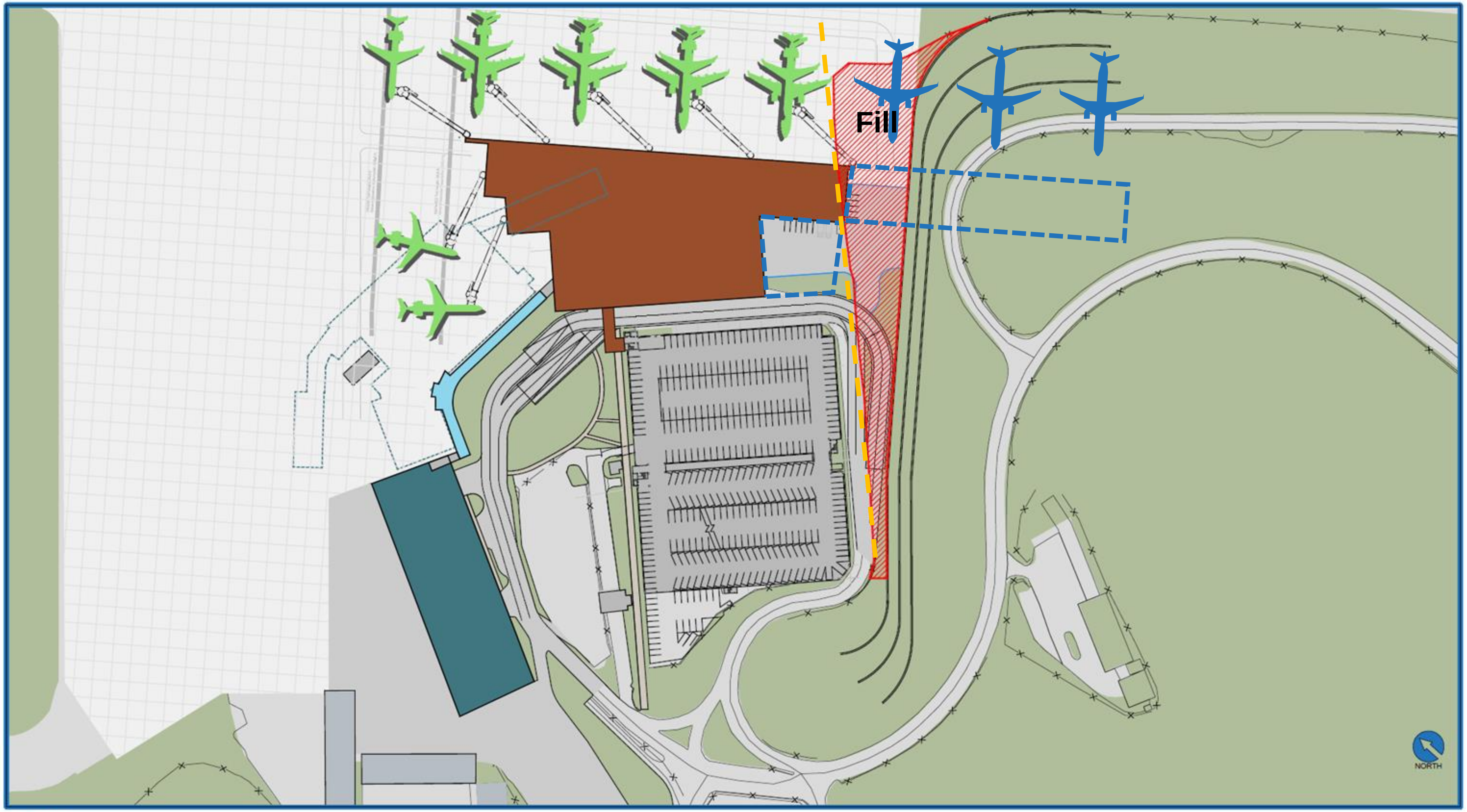


**CRW**

**Partial Site Plan - Two Level Curb**

File: 2022 0217 Site Plan.dwg Layout: P5 Last Saved: 2/17/2022 8:51 PM Plotted On: 2/18/2022 8:46 AM

Scale: 1/128"=1'-0"

Source:
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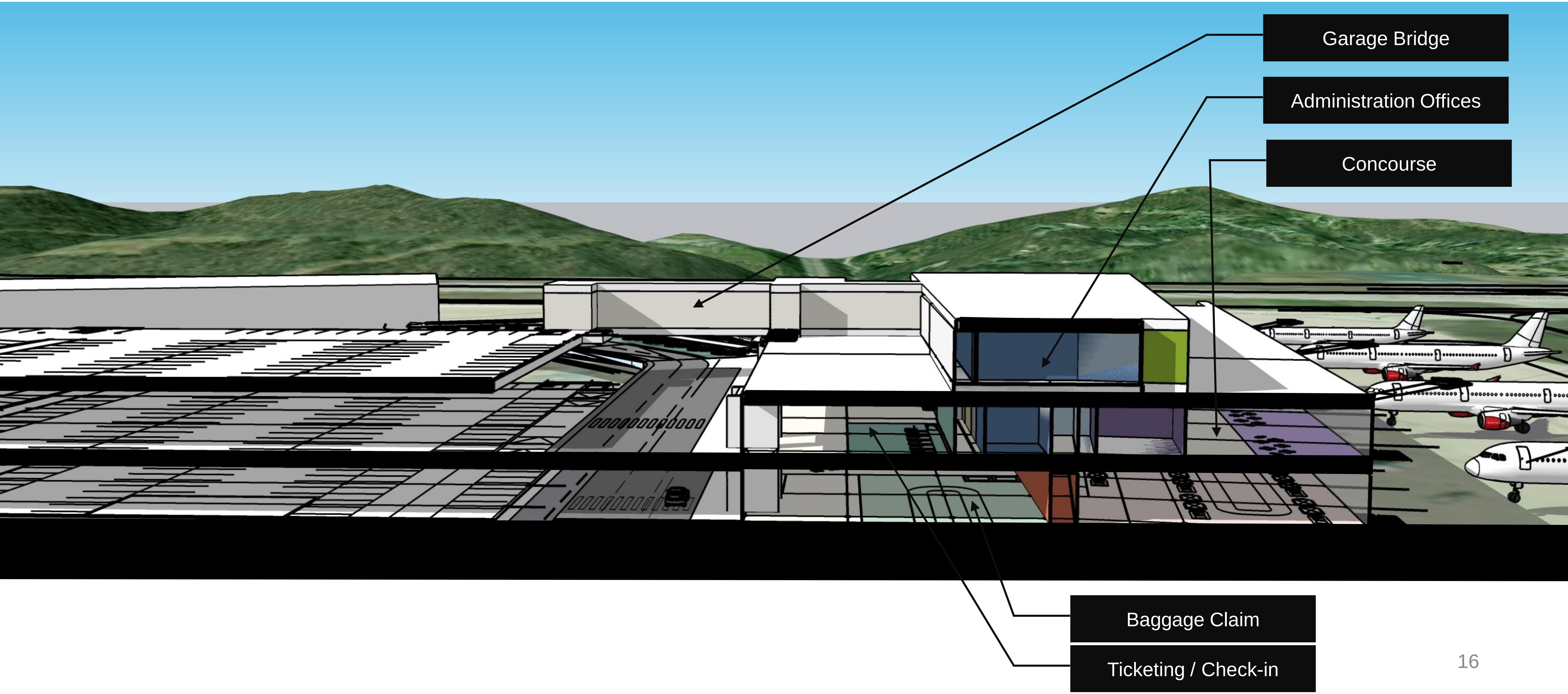
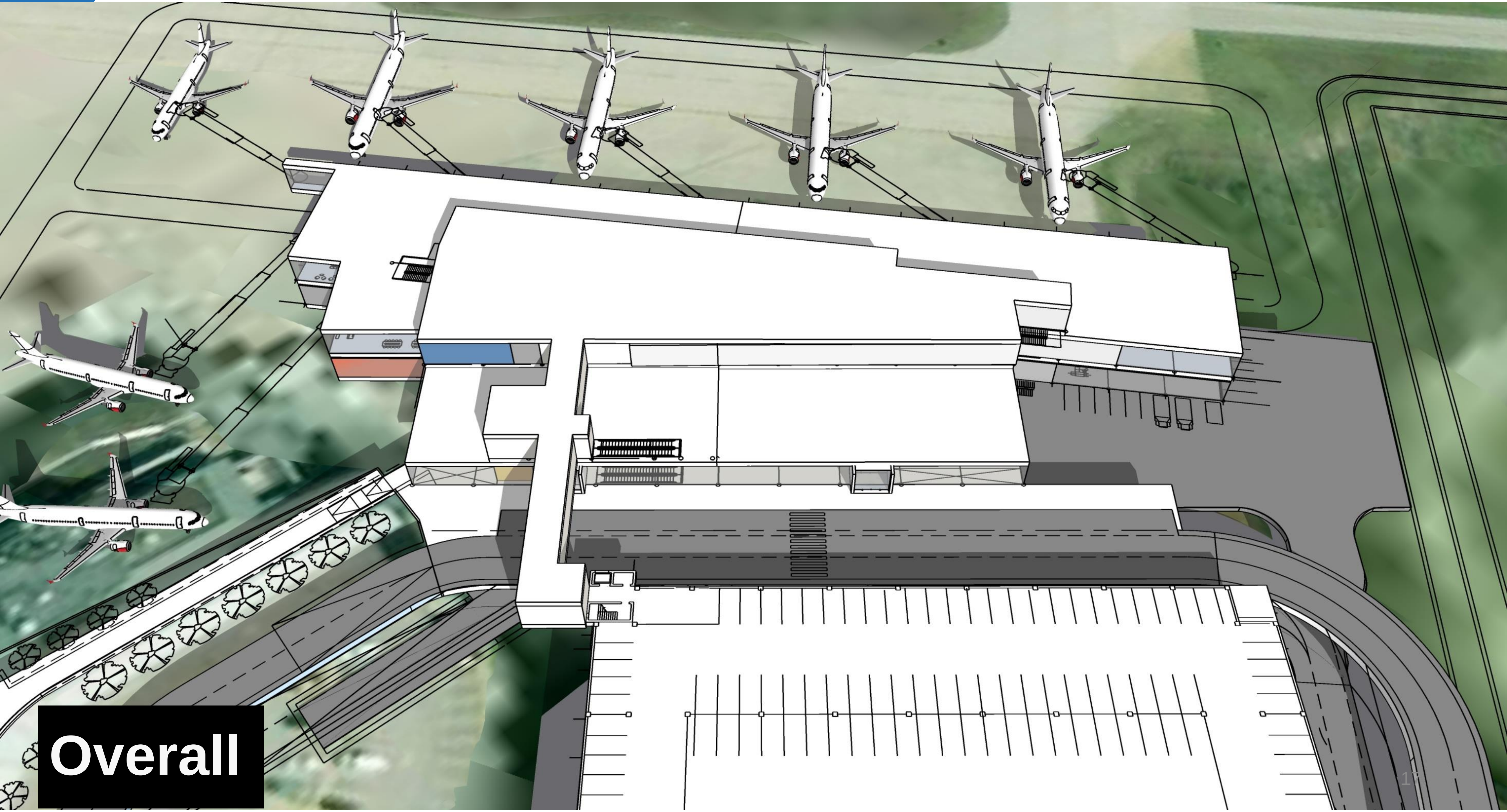
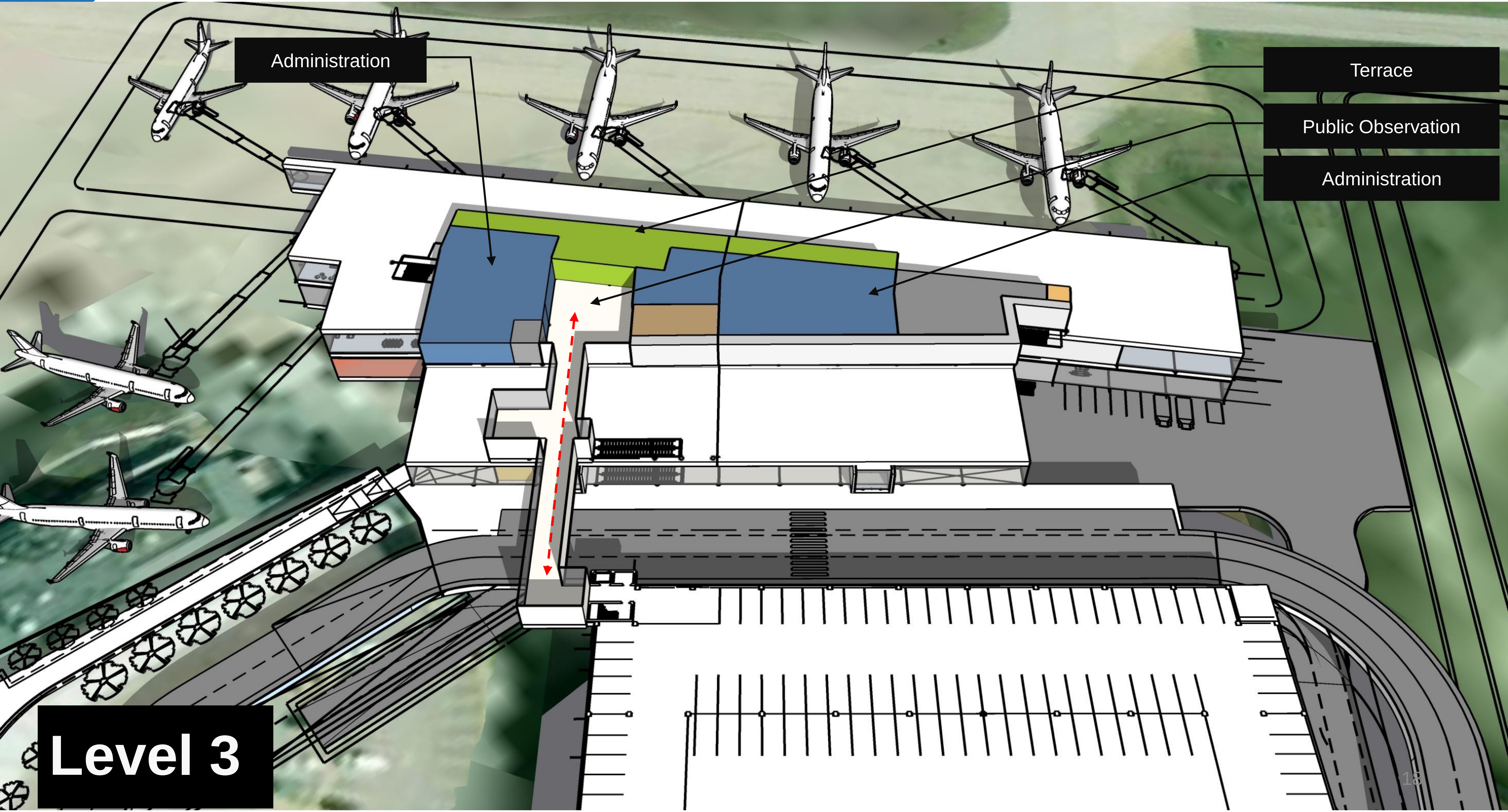
# Concept 1A Section



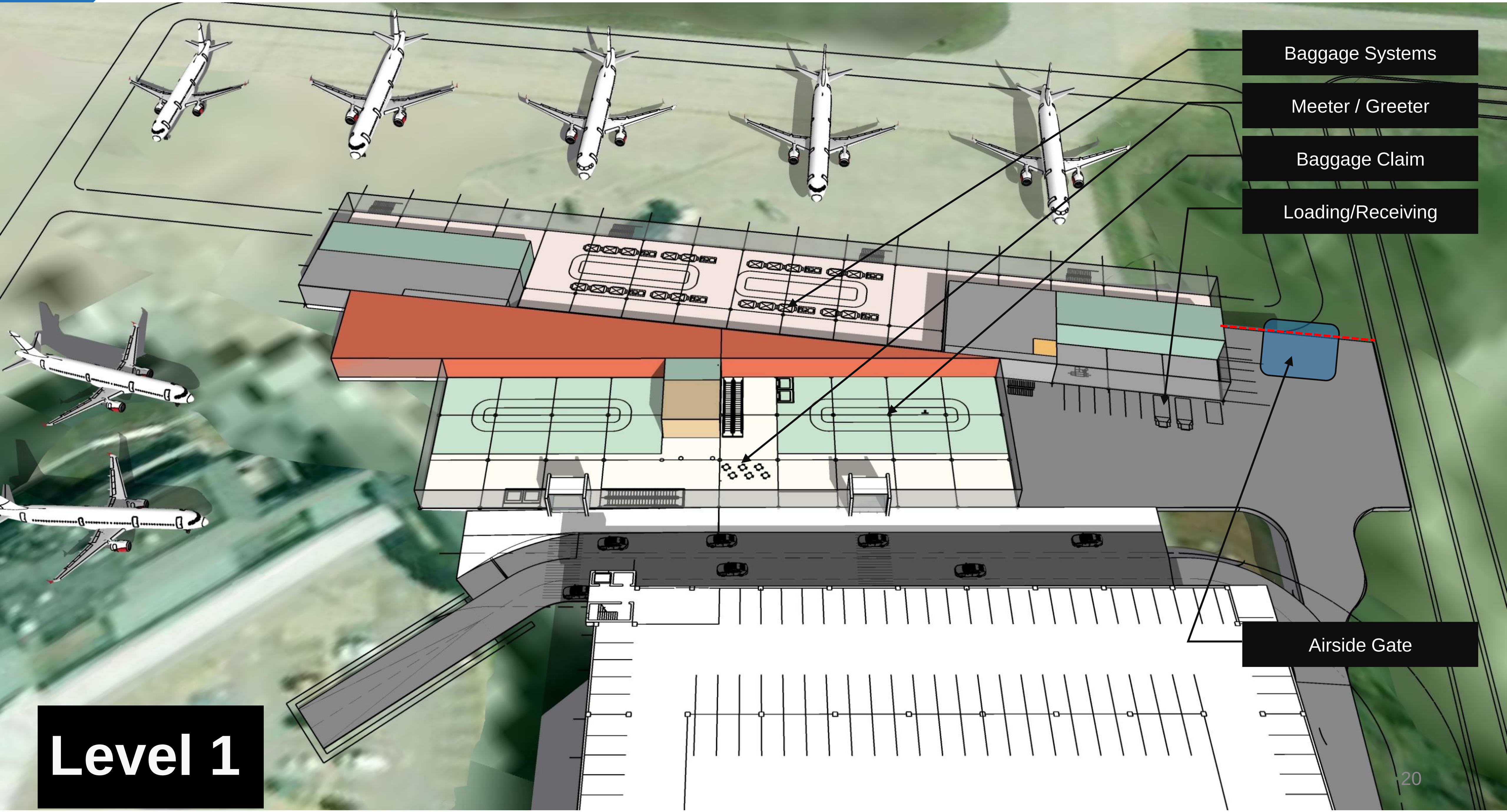


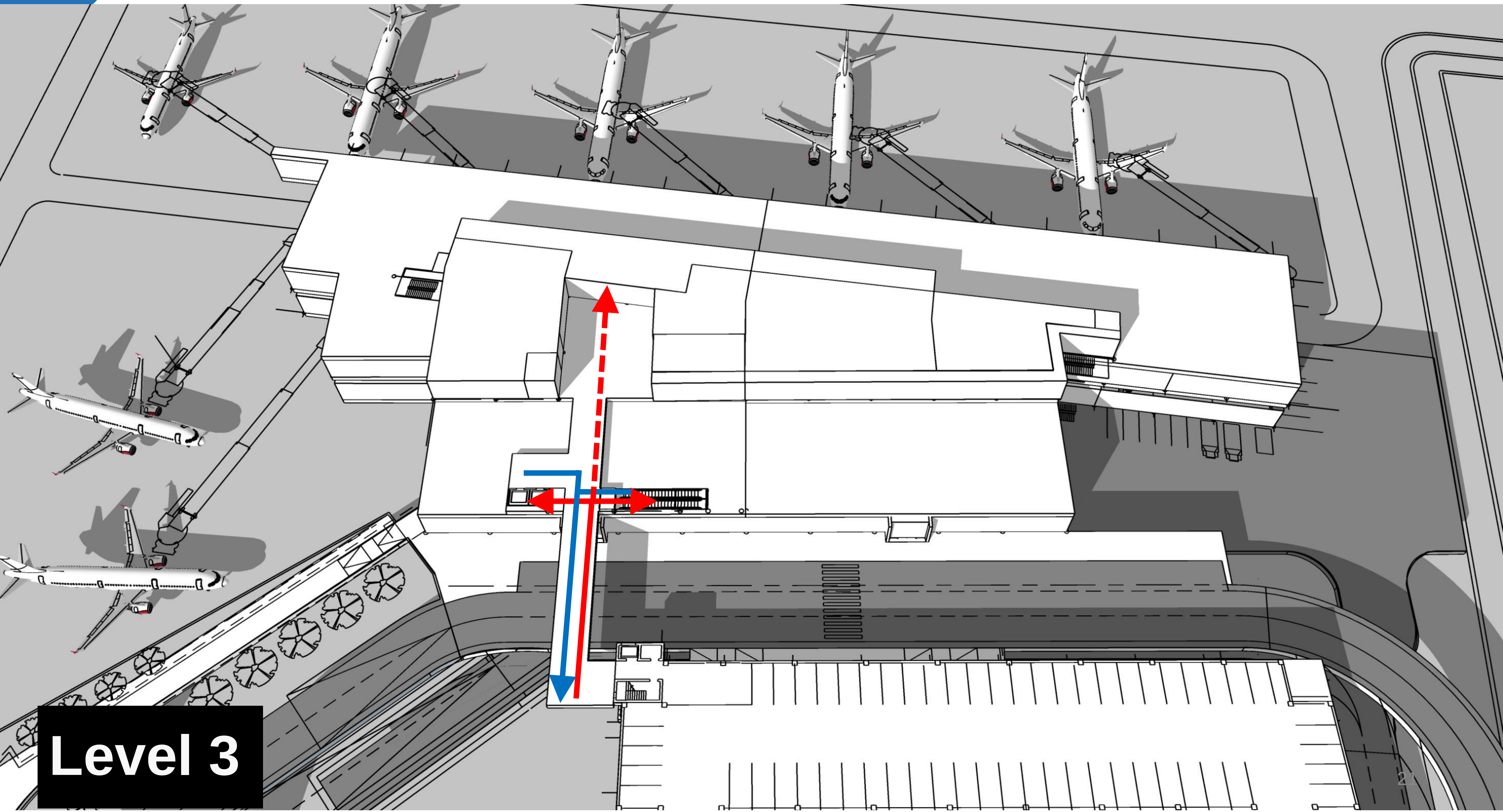
# Overall

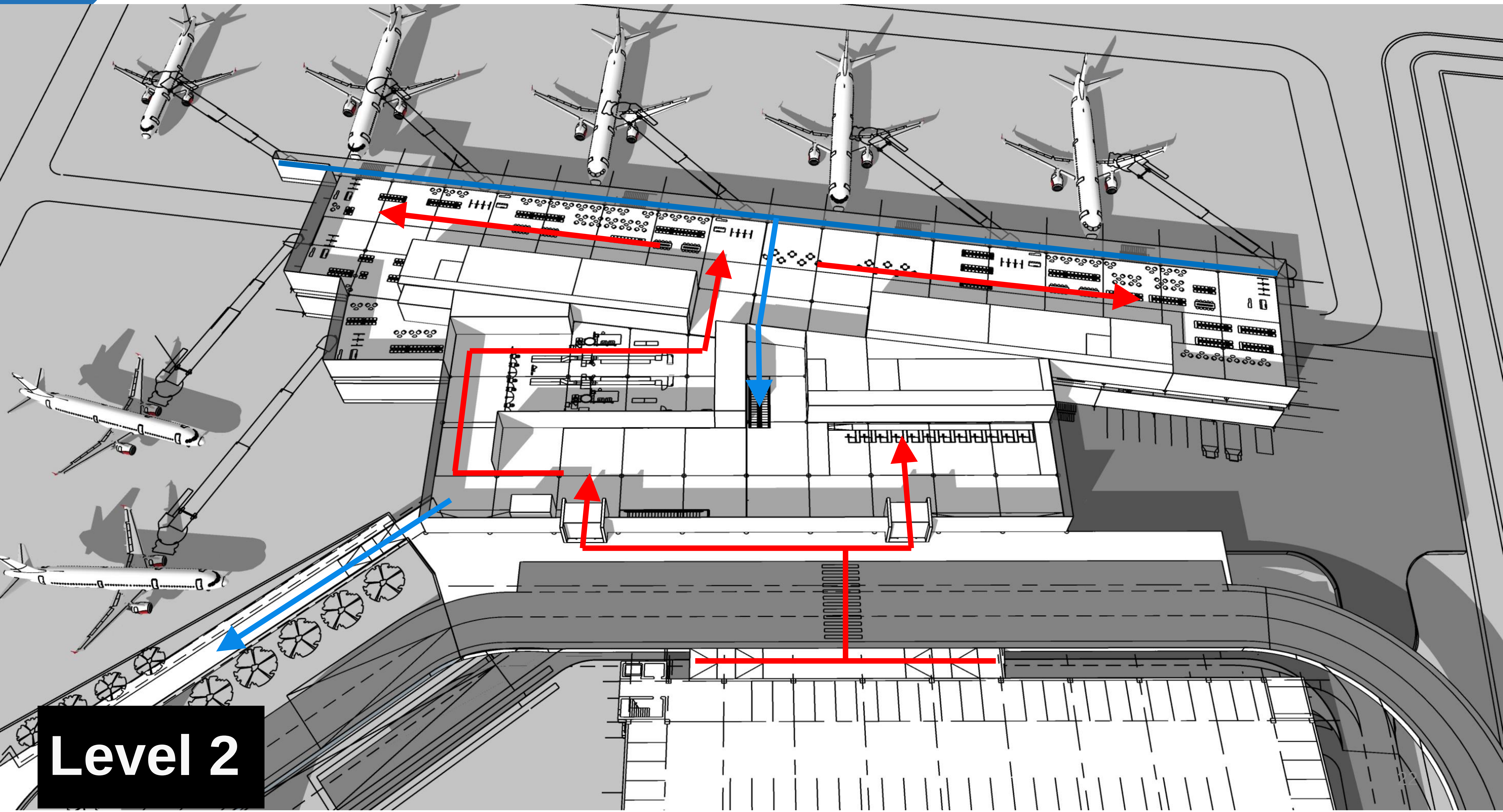

Administration
Terrace
Public Observation
Administration

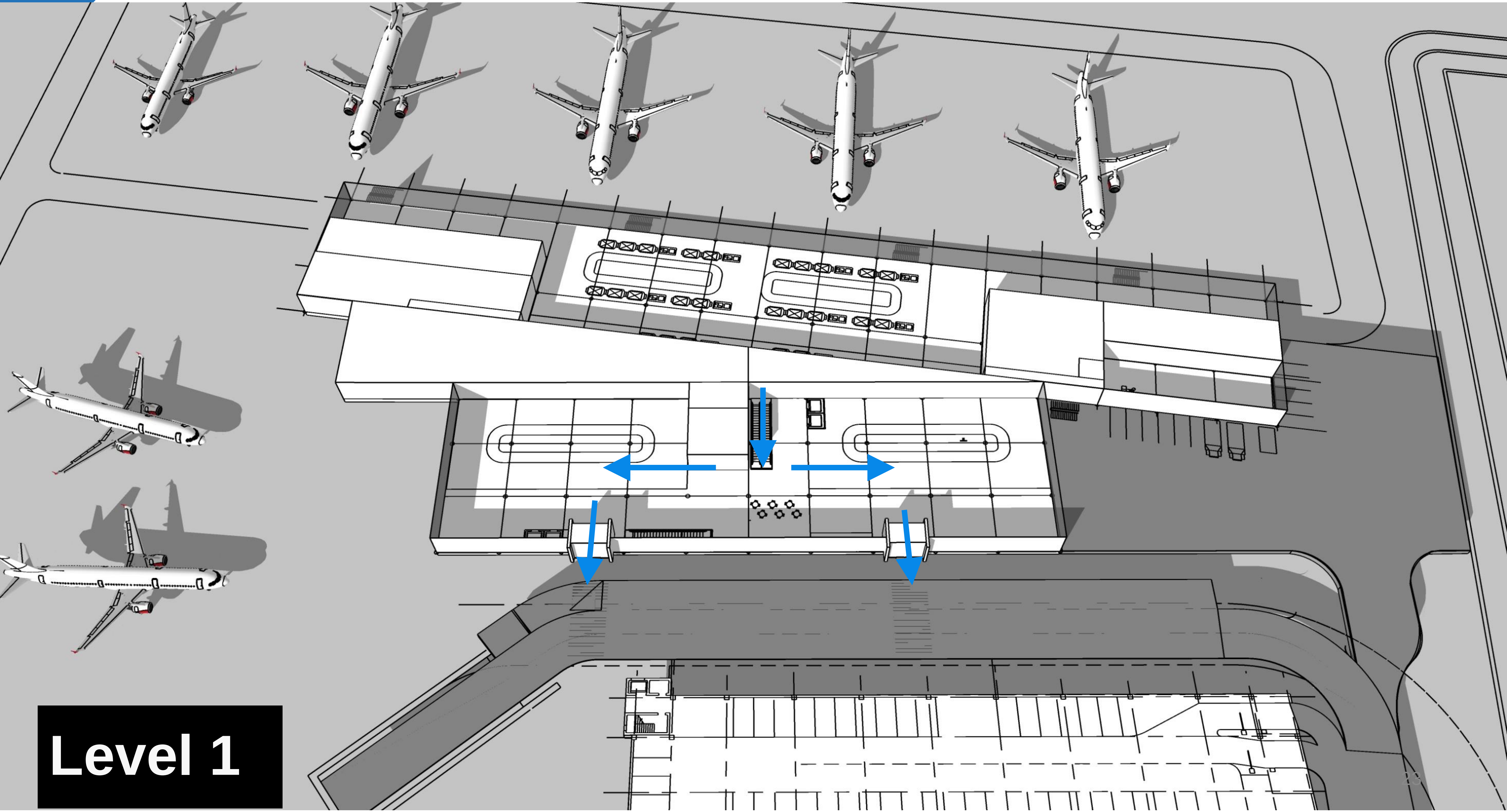
# Level 3


Security Checkpoint
Concourse
Holdrooms
Concessions
Ticketing / Check-in
Level 2

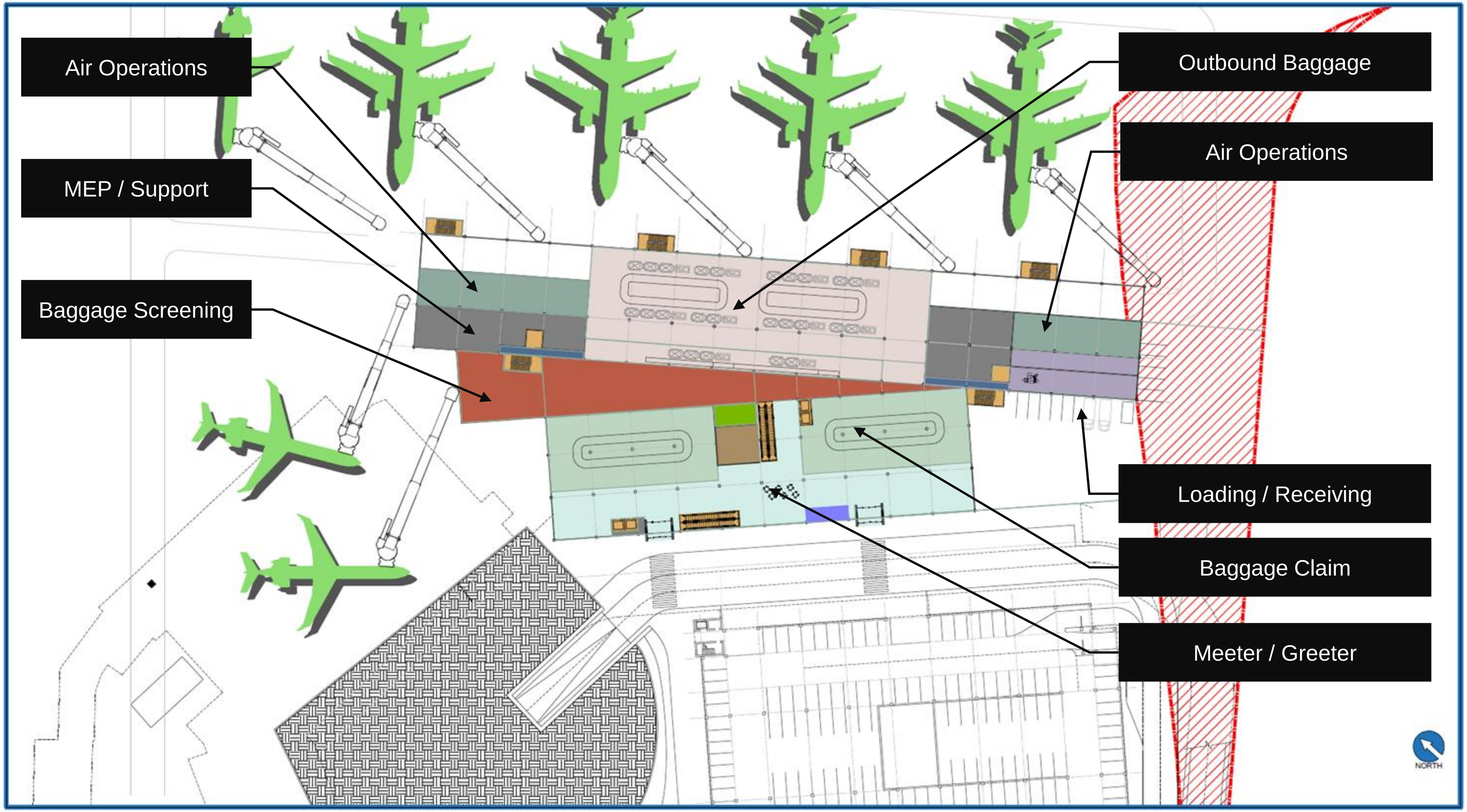

Baggage Systems
Meeter / Greeter
Baggage Claim
Loading/Receiving
Airside Gate
Level 1


Level 3


Level 2



# Level 1




## Legend

- Restrooms
- Airport Operations
- BSO
- Baggage Make Up
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Vertical Circulation
- Support or MEP
- Tenant Spaces
- Concession Support
- Loading Dock
- Inbound Baggage
- Amenities

# CRW
# First Floor Alternative 1A

File: 2022 0214 Preferred Concept 1A.dwg Layout: L1 Last Saved: 2/18/2022 3:18 PM Plotted On: 2/18/2022 4:18 PM

Scale: 1/64"=1'-0"

Source:
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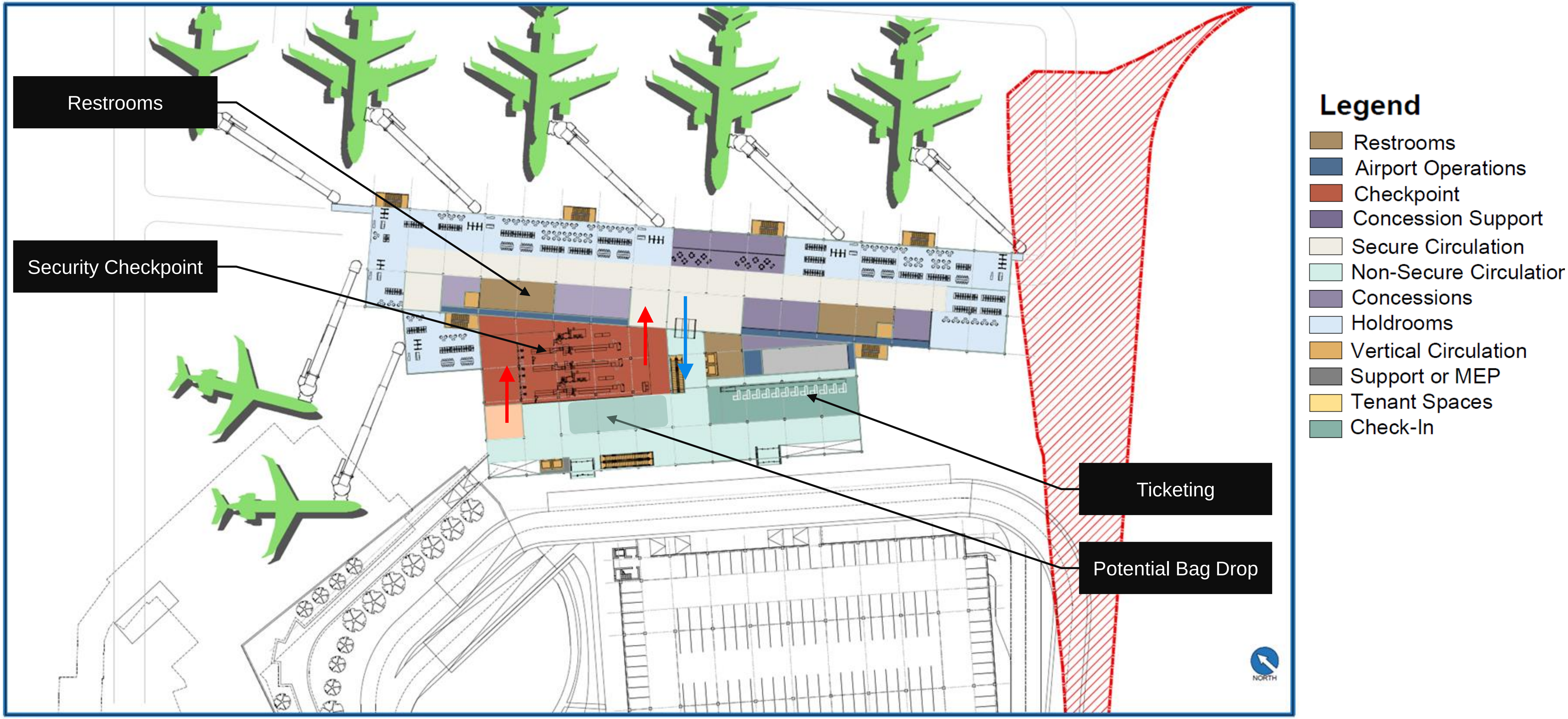


# CRW
# Second Floor Alternative 1A

File: 2022 0214 Preferred Concept 1A.dwg Layout: L2 Last Saved: 2/18/2022 3:18 PM Plotted On: 2/18/2022 4:16 PM

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown
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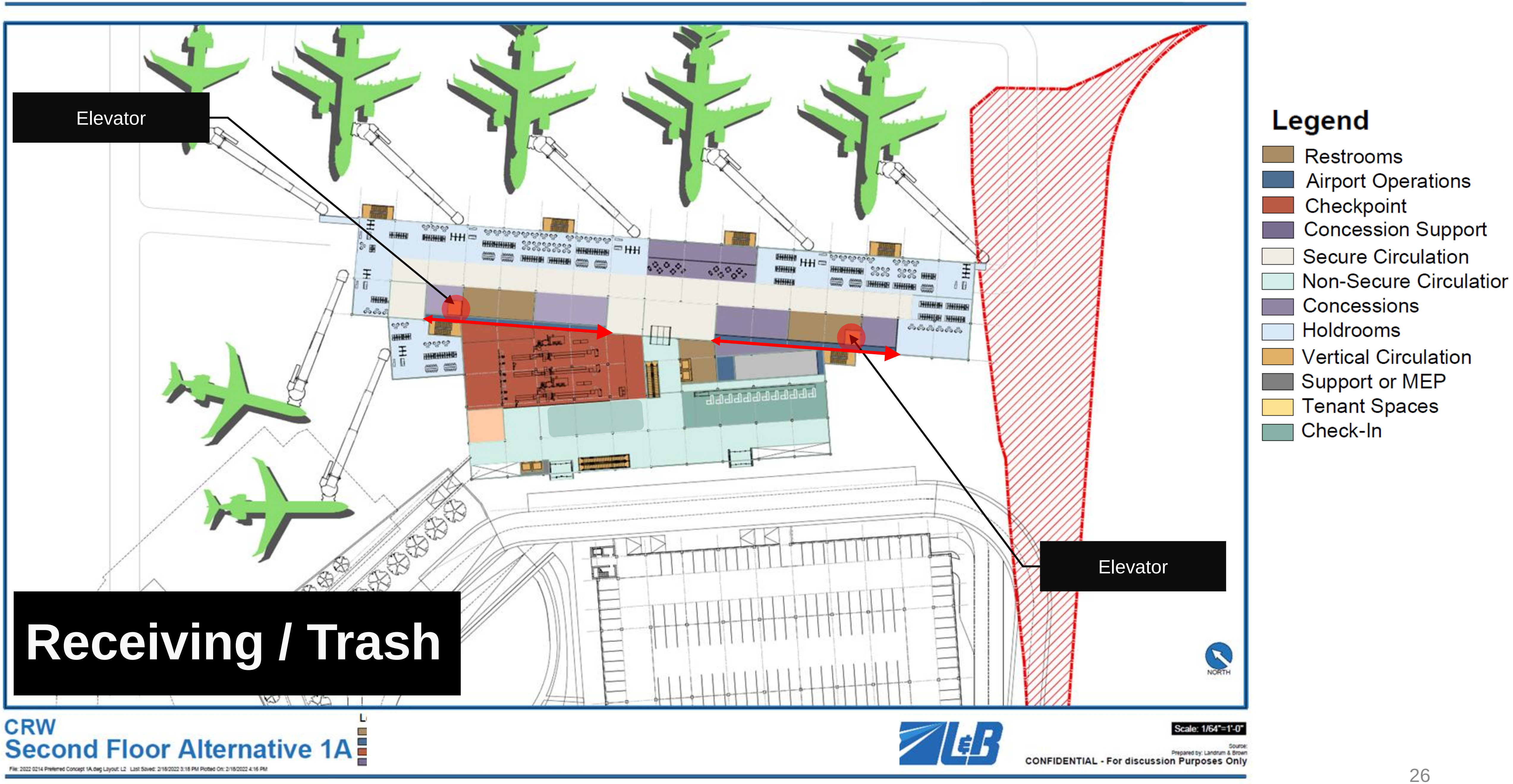
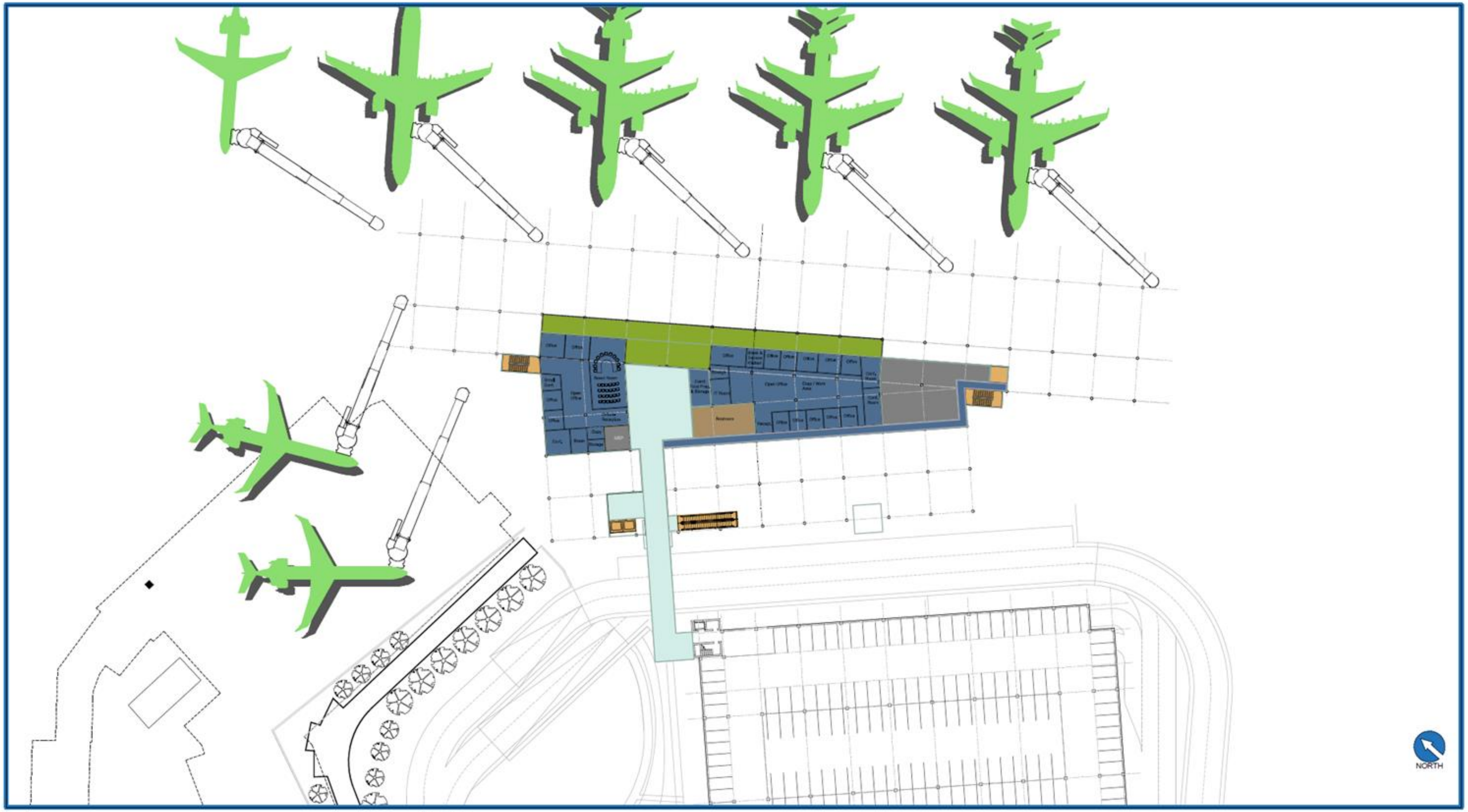

Elevator
Elevator
Receiving / Trash
Legend
Restrooms
Airport Operations
Checkpoint
Concession Support
Secure Circulation
Non-Secure Circulatior
Concessions
Holdrooms
Vertical Circulation
Support or MEP
Tenant Spaces
Check-In
NORTH
CRW
Second Floor Alternative 1A
Scale: 1/64"=1'-0"
CONFIDENTIAL - For discussion Purposes Only




## Legend

- Restrooms
- Airport Operations
- Vertical Circulation
- Support or MEP
- Secure Circulation

CRW
# Third Floor Alternative 1A

File: 2022 0214 Preferred Concept 1A.dwg Layout: L3 Last Saved: 2/18/2022 3:18 PM Plotted On: 2/18/2022 4:08 PM

Scale: 1/64"=1'-0"

Source:
Prepared by: Landrum & Brown

CONFIDENTIAL - For discussion Purposes Only


## Legend

- Restrooms
- Airport Operations
- Vertical Circulation
- Support or MEP
- Secure Circulation

# CRW
# Third Floor Alternative 1A

File: 2022 0214 Preferred Concept 1A.dwg Layout: L3-Zoom Last Saved: 2/18/2022 3:18 PM Plotted On: 2/18/2022 4:08 PM

Scale: 1/32"=1'-0"

Source:
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# Area Summary

| Space Designation | Existing | | Program 2037 High | | Option 1A (Original) | | Option 1A (Revised) | |
|---|---|---|---|---|---|---|---|---|
| | Unit | SF | Unit | SF | Unit | SF | Unit | SF |
| Check-in | 16 | 5,074 | 12 | 4,010 | 16 | 4,757 | 12 | 3,492 |
| Airline Offices | | 3,297 | | 830 | | 1,794 | | 1,368 |
| Baggage Make-up / Drop-off | | 5,263 | | 17,920 | | 31,906 | | 15,570 |
| CBIS/CBRA Checked Bag Screening | | 1,938 | | 7,200 | | 3,122 | | 8,751 |
| Baggage Claim / BSO | 1 | 3,873 | | 9,210 | 2 | 11,345 | 2 | 12,871 |
| Holdrooms | | 14,410 | | 14,340 | | 19,868 | | 19,150 |
| Business Lounge | | | | | | | | |
| Airline Operations | | 1,166 | | 5,500 | | 7,506 | | 5,266 |
| Non-Secure Circulation / Lobbies | | 13,497 | | 8,414 | | 44,012 | | 29,255 |
| Secured Circulation | | 3,486 | | 29,187 | | 12,499 | | 12,153 |
| Restrooms | | 3,592 | | 5,750 | | 3,421 | | 5,320 |
| Security Screening Check Point | 2 | 1,813 | 2 | 5,400 | 3 | 9,170 | 3 | 8,419 |
| TSA Offices | | 2,391 | | 920 | | 3,820 | | 1,459 |
| Concessions | | 4,434 | | 6,260 | | 10,909 | | 7,351 |
| Airport Operations / Administration | | 11,233 | | 10,833 | | 9,000 | | 14,086 |
| Tenant Spaces | | 13,451 | | | | 2,585 | | 282 |
| Vertical Circulation | | 4,568 | | 4,060 | | 2,137 | | 7,495 |
| MEP/Support | | 5,689 | | 16,210 | | 5,648 | | 8,777 |
| Loading Dock | | | | 750 | | 3,435 | | 2,580 |
| **Total Areas** | | **99,175** | | **146,794** | | **186,934** | | **163,645** |
| Terrace | | | | | | 7,139 | | 4,045 |

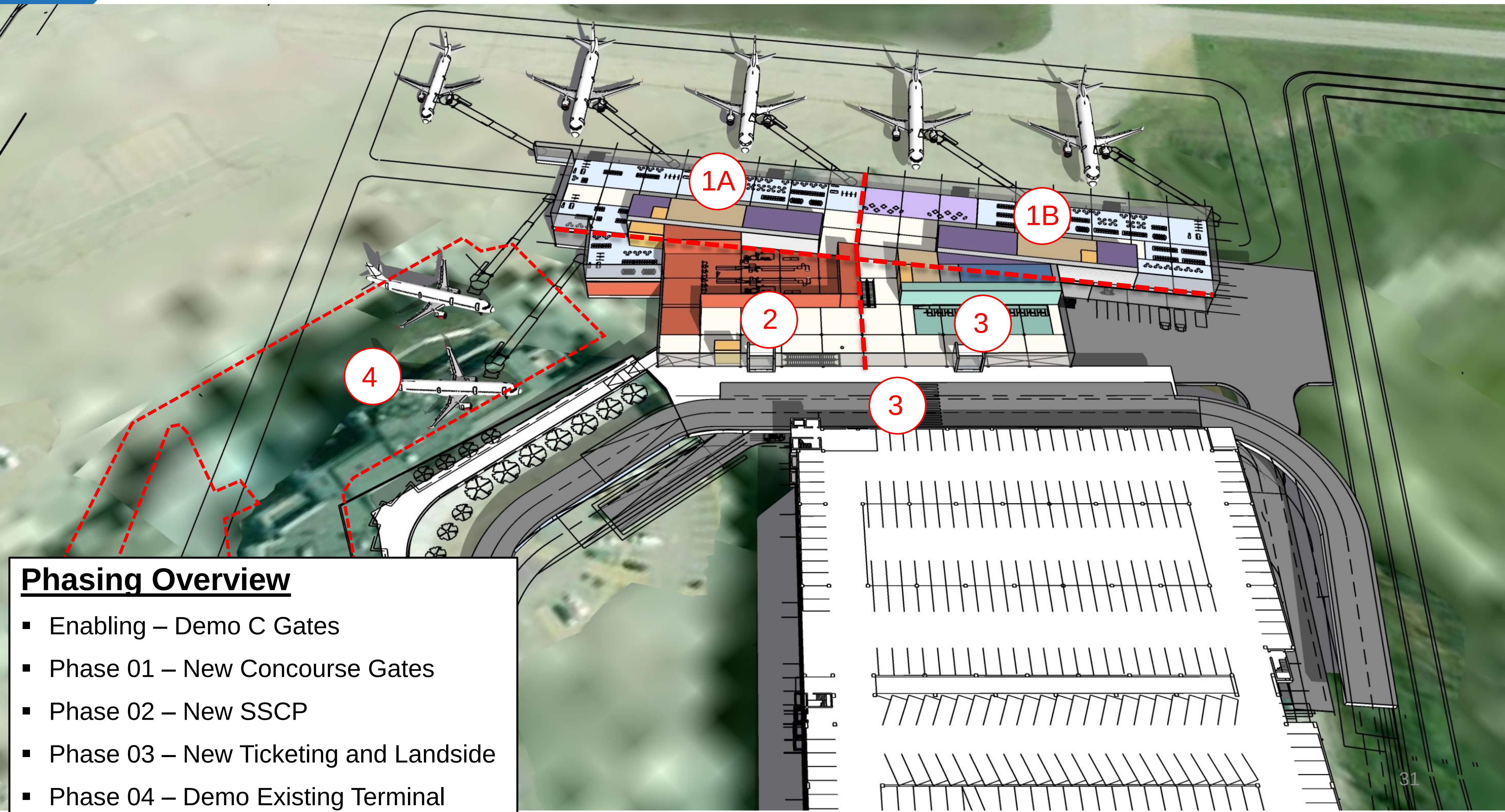
# Terminal Phasing Approach

Purpose:

*Logical phased approach with the flexibility to implement the preferred solution to align with funding source availability as needed.*

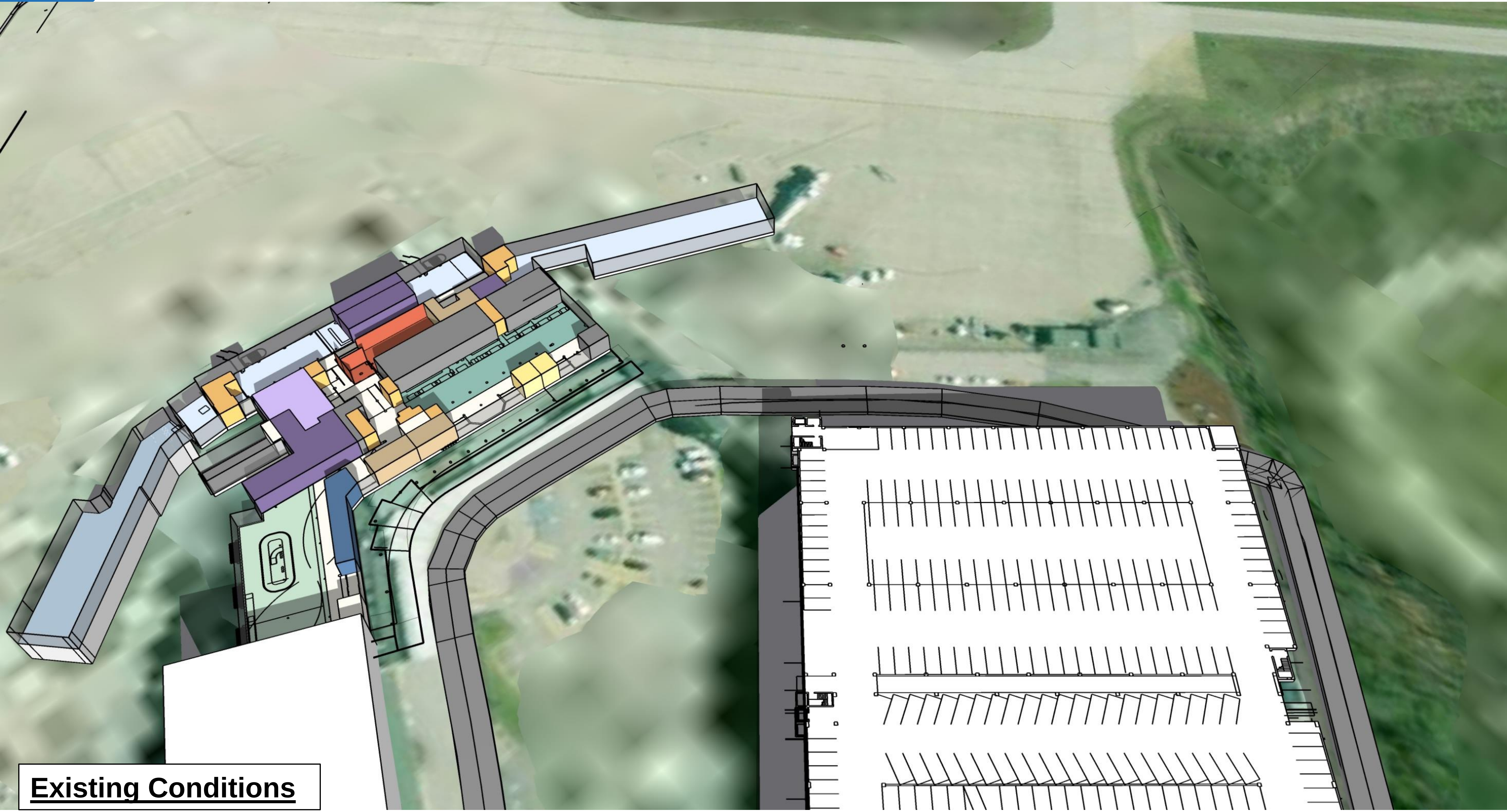
Priorities:

- Security Checkpoint
- Holdroom and Gate Capacity
- Increase Concessions / Revenue
- Allow for ADA Compliance and Safety Enhancements
- Create an Efficient Curbfront, Flexible for Growth
- Modernize CRW Administration and Support Spaces (Board Room, other)
- Minimize Fill for Cost Reduction

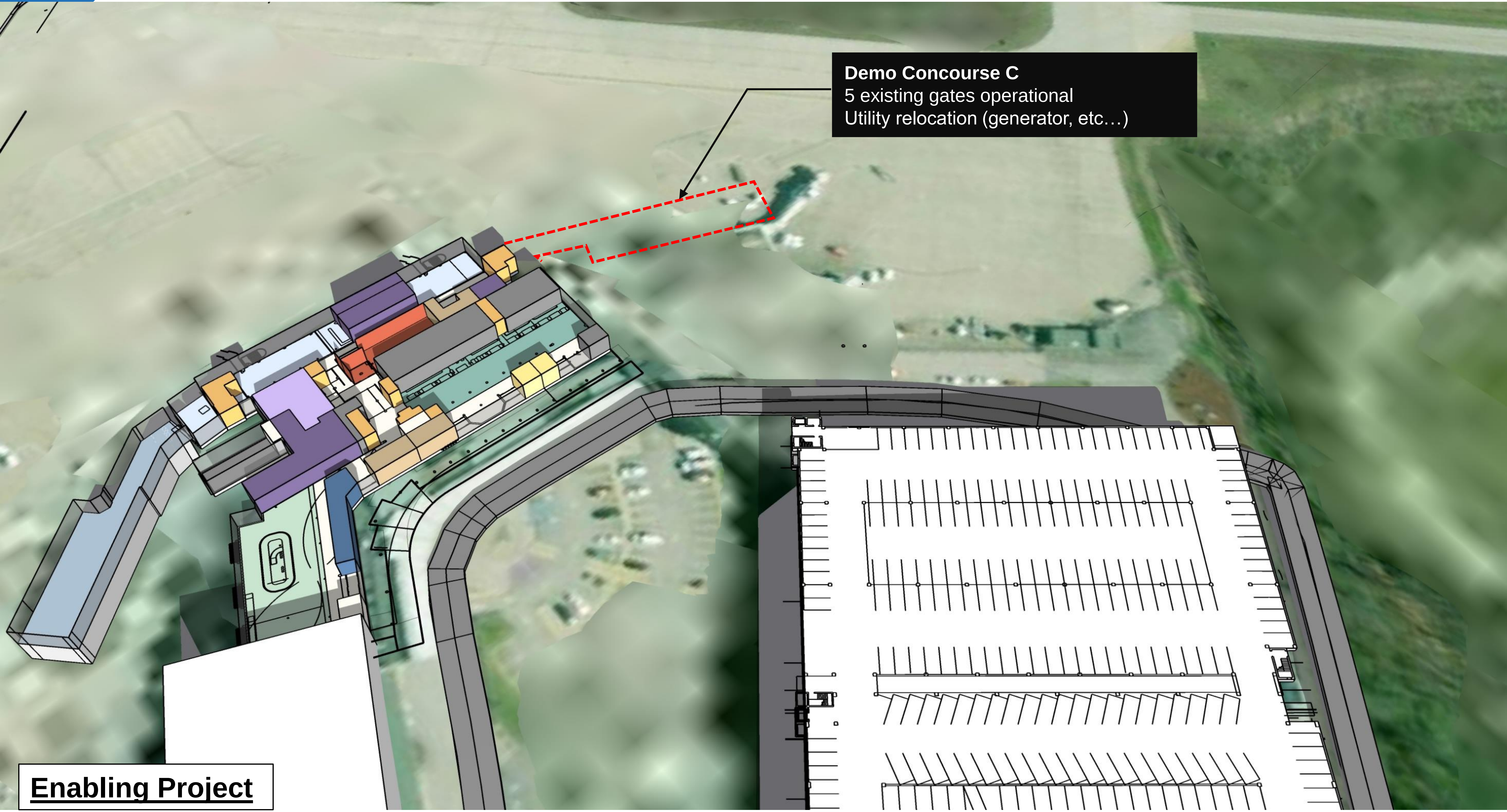



## Phasing Overview

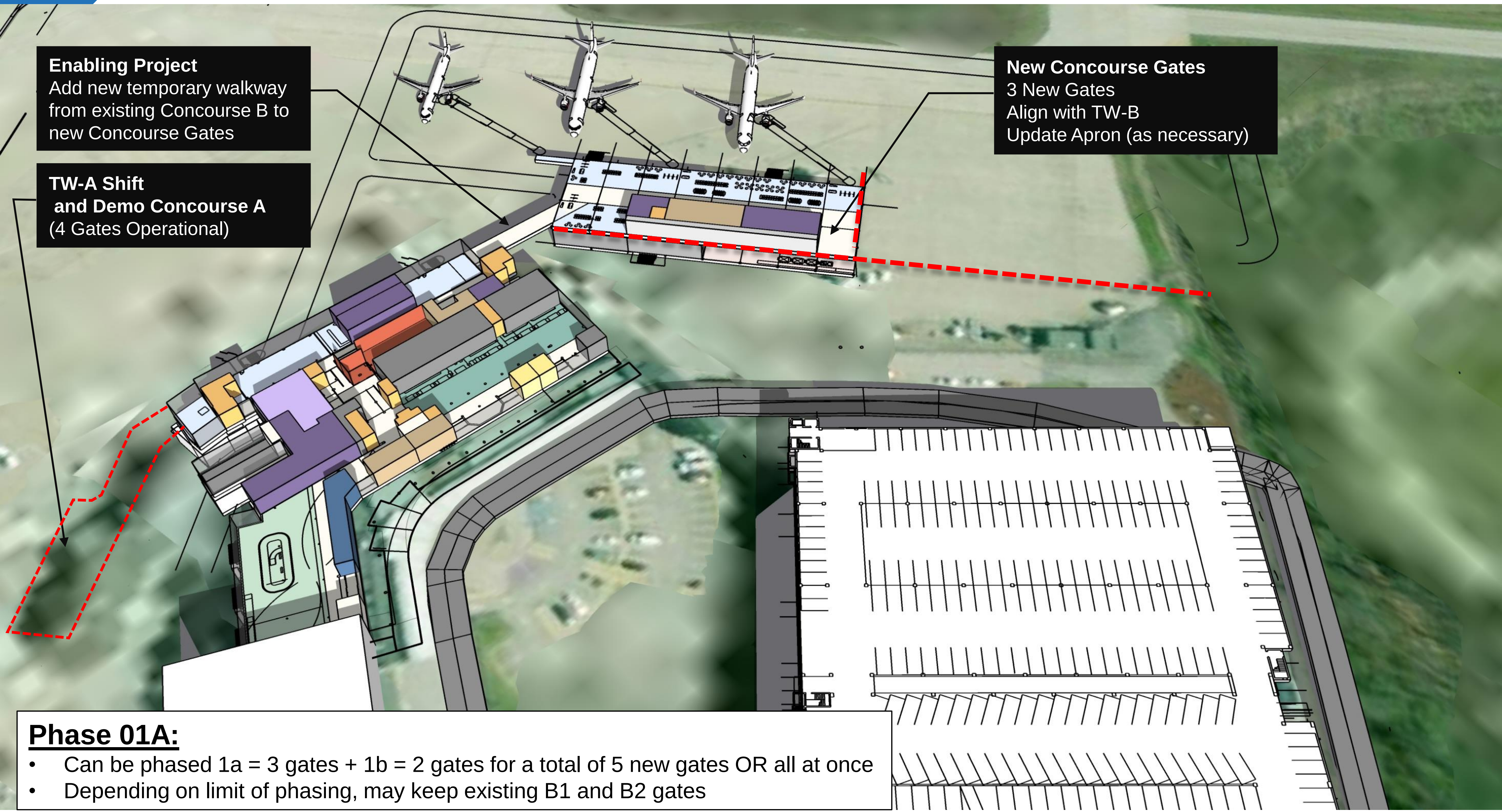
- Enabling – Demo C Gates
- Phase 01 – New Concourse Gates
- Phase 02 – New SSCP
- Phase 03 – New Ticketing and Landside
- Phase 04 – Demo Existing Terminal



**Existing Conditions**

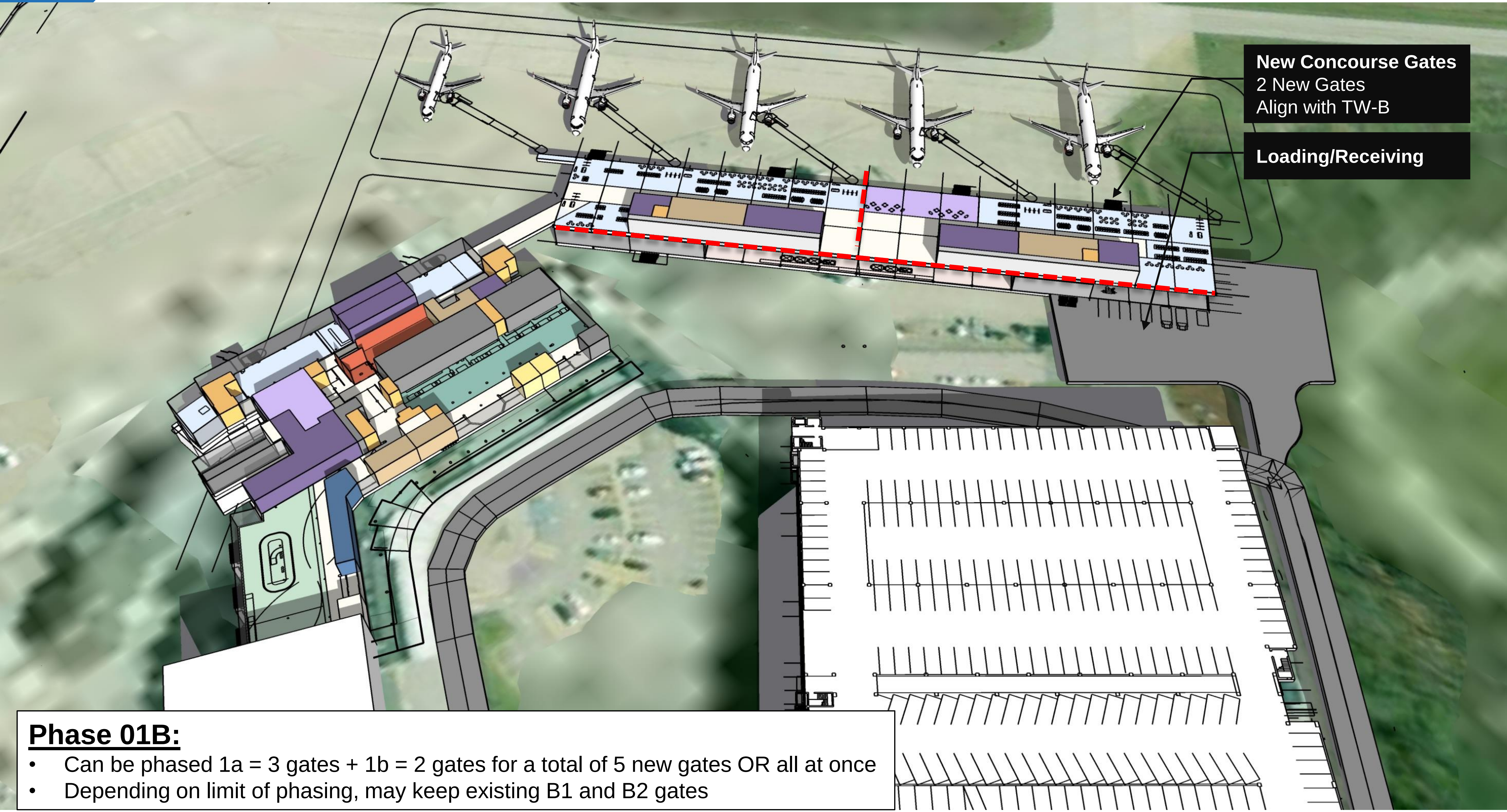



**Enabling Project**



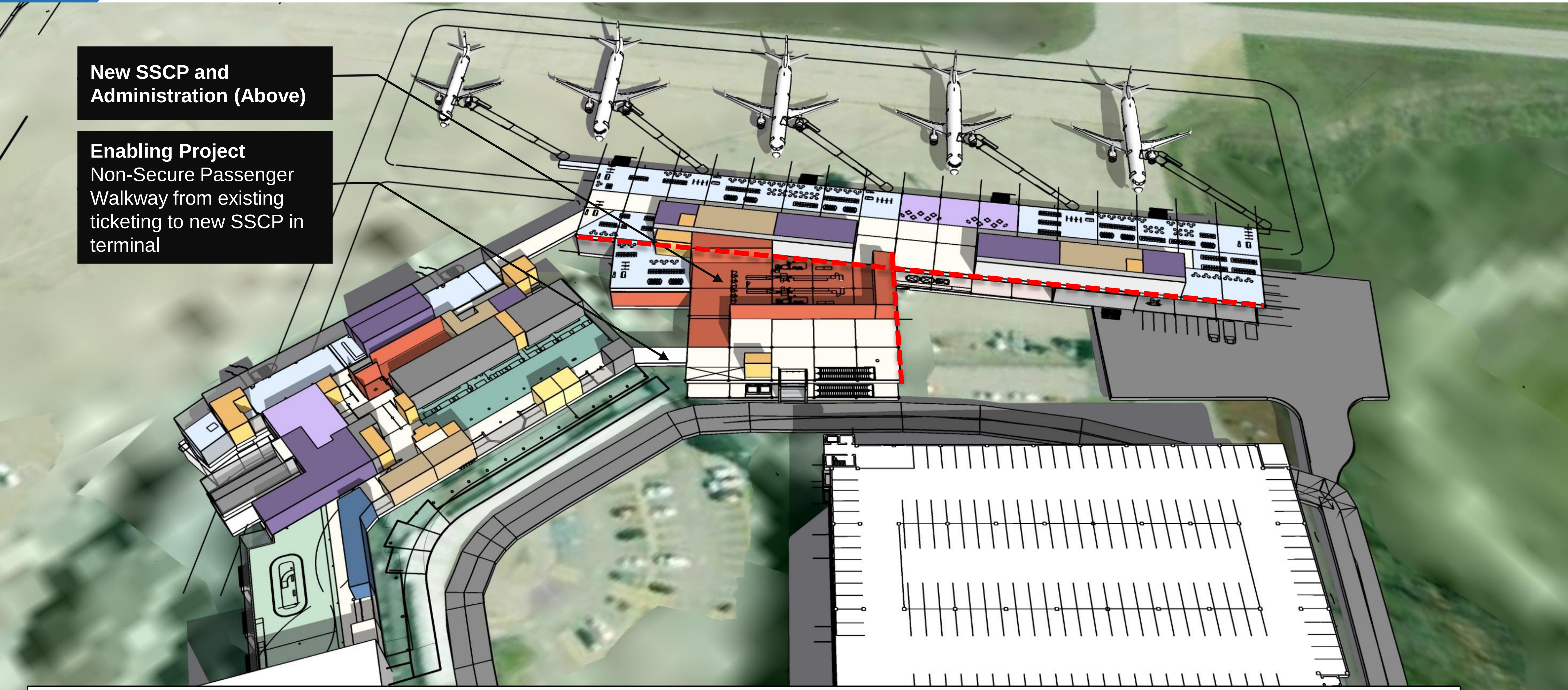

## Phase 01A:

- Can be phased 1a = 3 gates + 1b = 2 gates for a total of 5 new gates OR all at once
- Depending on limit of phasing, may keep existing B1 and B2 gates



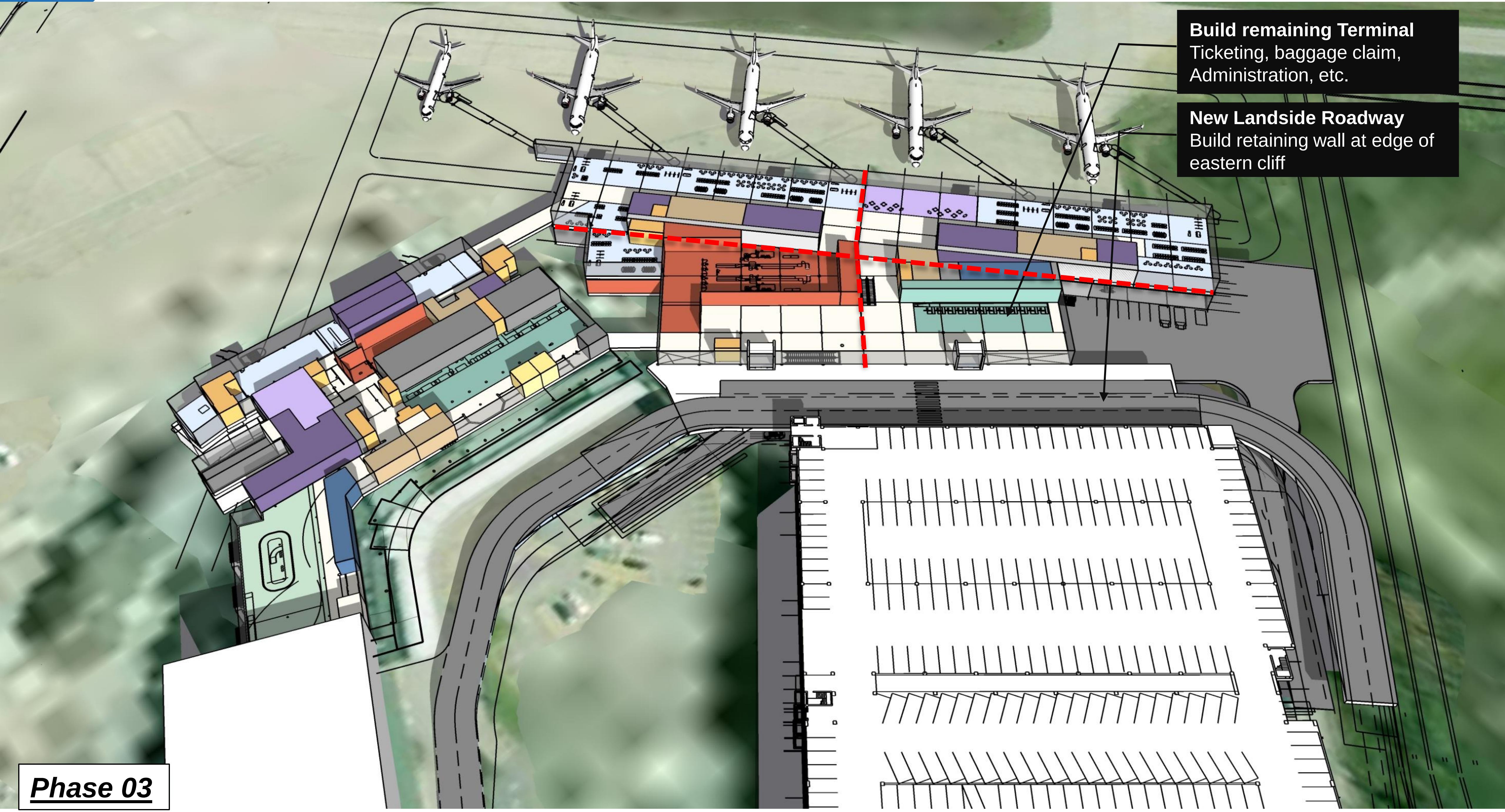

**Phase 01B:**

- Can be phased 1a = 3 gates + 1b = 2 gates for a total of 5 new gates OR all at once
- Depending on limit of phasing, may keep existing B1 and B2 gates




**Phase 02:**

- Enabling Project: Demolish existing garage bridge and build new bridge to new terminal SSCP building
- SSCP Alternate Option:
  - Renovate existing SSCP by expanding into existing concourse (demo existing B1 and concessions). Move exit lane to outer wall.
  - Defers the need for new terminal SSCP if existing building can remain in place longer.


Build remaining Terminal
Ticketing, baggage claim, Administration, etc.
New Landside Roadway
Build retaining wall at edge of eastern cliff

**Phase 03**


New Walkway to Rental Car
covered/conditioned walkway
to existing Rental Car Garage
Demolish Existing Terminal
Phase 04A


2 New Gates Online
Phase 04B

# Landside Considerations

# Landside Considerations

- Curbfront
  - Requirements (lengths and modal differences)
  - Potential solutions
- Garage Entry Options
- Construction Phasing Options

# Landside Requirements – 2037 Demand Level

- **242’ combined curb length requirement for arrivals and departures operations**

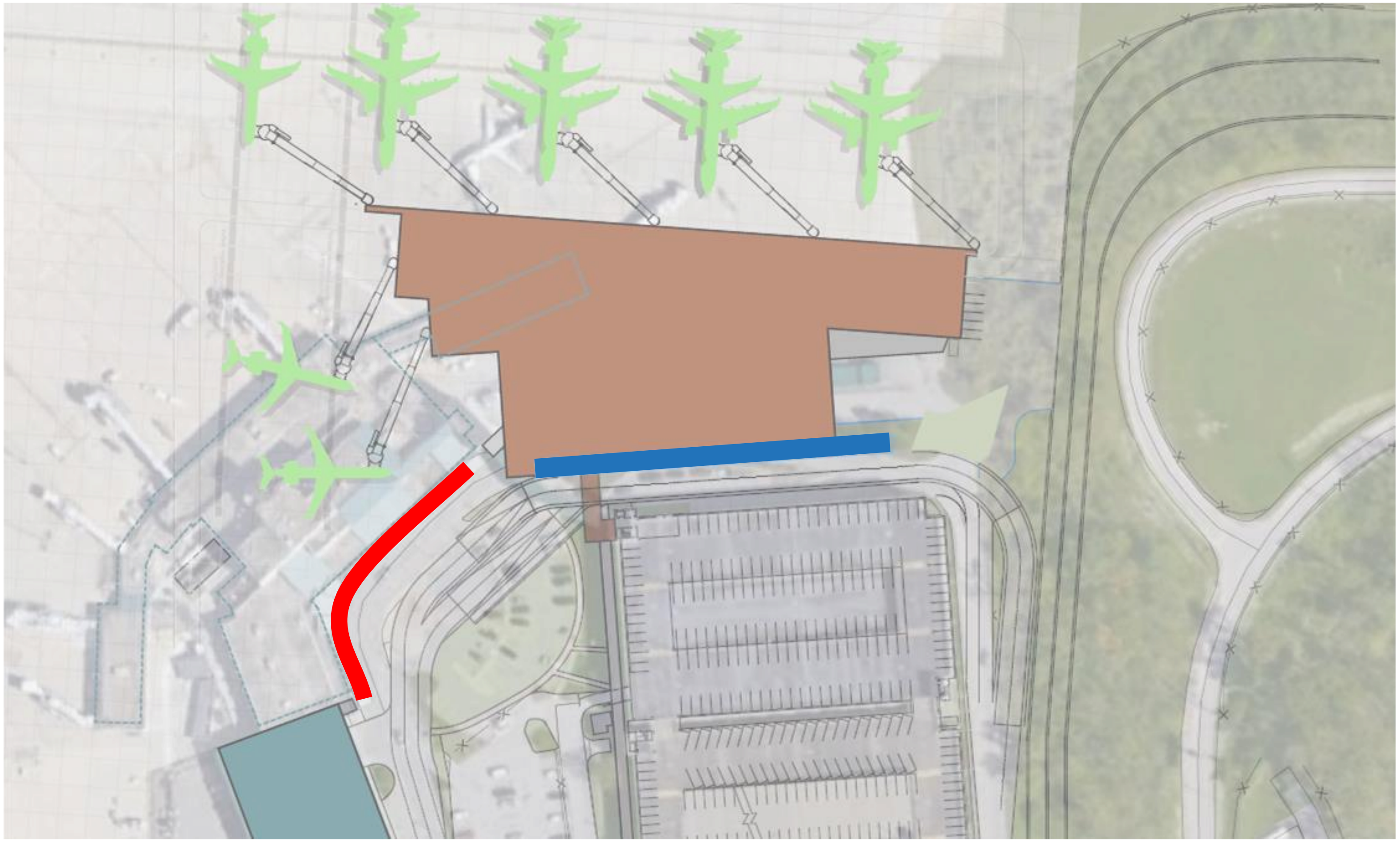
| Vehicle Type | Design Hour Demand in Vehicles | Peak 15 Minutes as % of Demand 40% | Vehicle Dwell Time (min.) | Peak 15 Min. Demand in Minutes | Vehicle Length (ft) | Peak 15 Min. Demand (ft* min.) | Peak 15 Min. Demand (ft) |
|---|---|---|---|---|---|---|---|
| Private Auto | 119 | **48** | 2.0 | **95** | 22 | **2,094** | **140** |
| Rental Car Shuttle* | 1 | **0** | 2.0 | **1** | 50 | **40** | **3** |
| Taxis | 60 | **24** | 2.0 | **48** | 22 | **1,056** | **70** |
| Limousines | 1 | **0** | 2.0 | **1** | 50 | **40** | **3** |
| Hotel Shuttles* | 1 | **0** | 2.0 | **1** | 50 | **40** | **3** |
| Bus | 3 | **1** | 5.0 | **6** | 60 | **360** | **24** |
| Metro/Train | 0 | **0** | 2.0 | **0** | 30 | **0** | **0** |
| Total | **185** | **74** | | | | Total | **242** |

- Assumptions:

| Mode | Location | % |
|---|---|---|
| Dropped-off at Curb | Curb | 26% |
| Rideshare / Taxi | Curb | 14% |
| Shuttle | Curb | 9% |
| Bus | Curb | 3% |
| Parking | Garage | 36% |
| Rental Car | Rental Center | 12% |
| Total | - | 100% |

- Assumed a combined peak of 502 passengers
- Allocated a higher percentage of passengers dropped off at curb
- 40% of passengers are at the curb in the peak 15 minutes
- **Existing Curb is approximately 260’**

# Curb Comparison

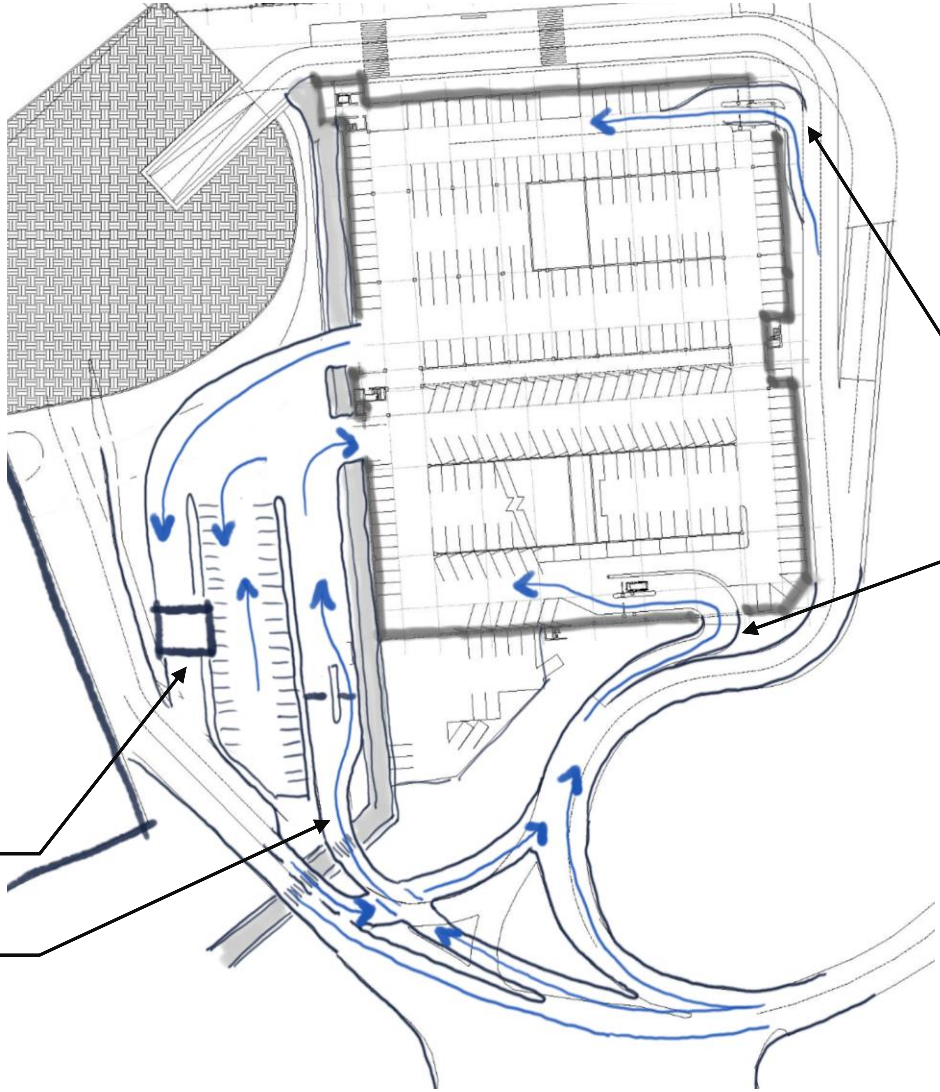


Proposed Curb: 640’ (320’ x 2)

Existing Curb: 260’

- A straight curb provides better utilization, capacity and better decision marking than a curved curb.
- The preferred plan exceeds the required curb linear frontage.

# Garage Entrances Options A



Garage Entrance Alternate 2

Garage Entrance Alternate 1

Garage Exit

Garage Entrance Alternate 3

# Garage Entrances Options B

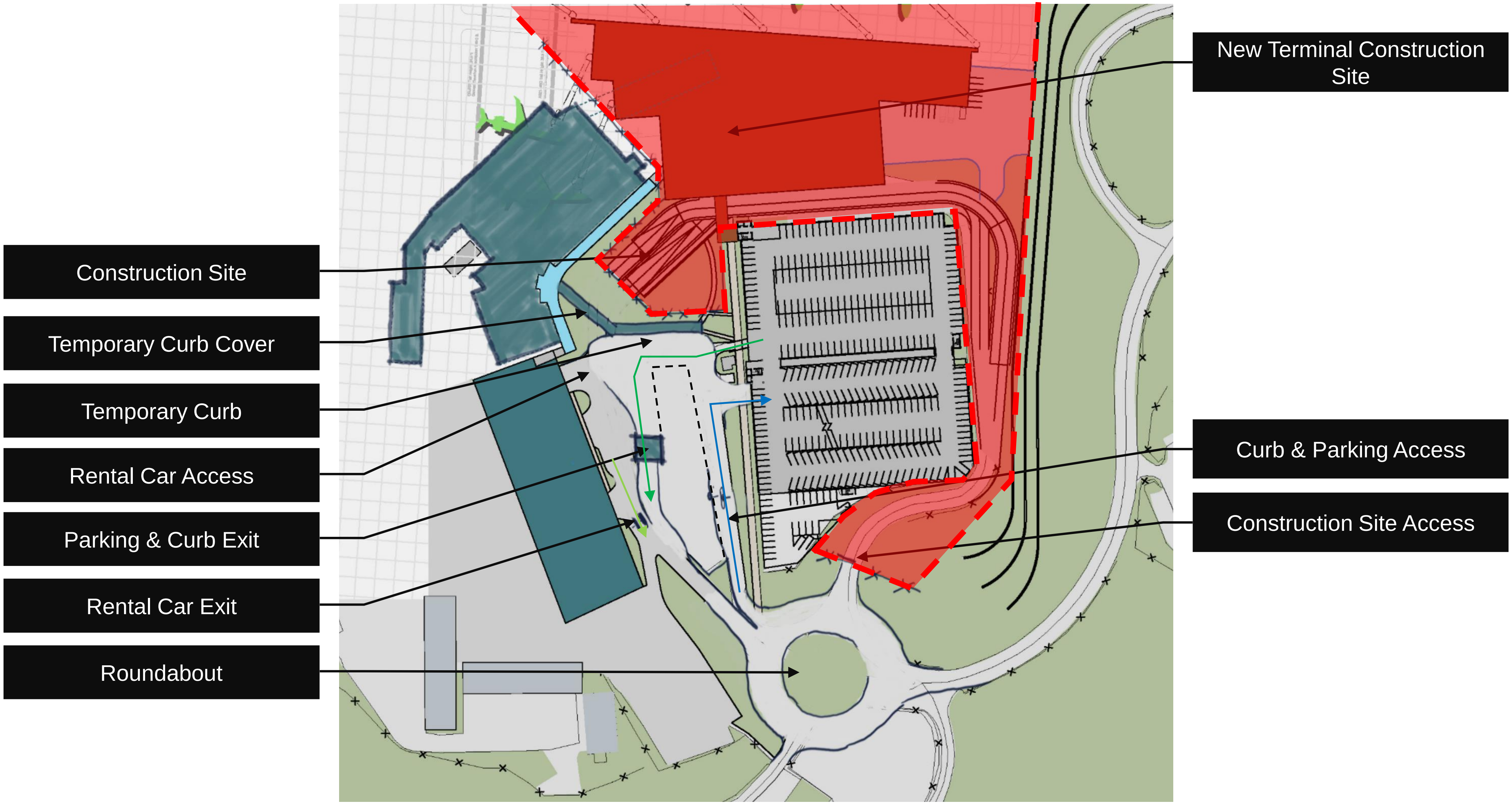
Garage Entrance Alternate 2

Garage Entrance Alternate 1

Garage Entrance Alternate 3

Roundabout

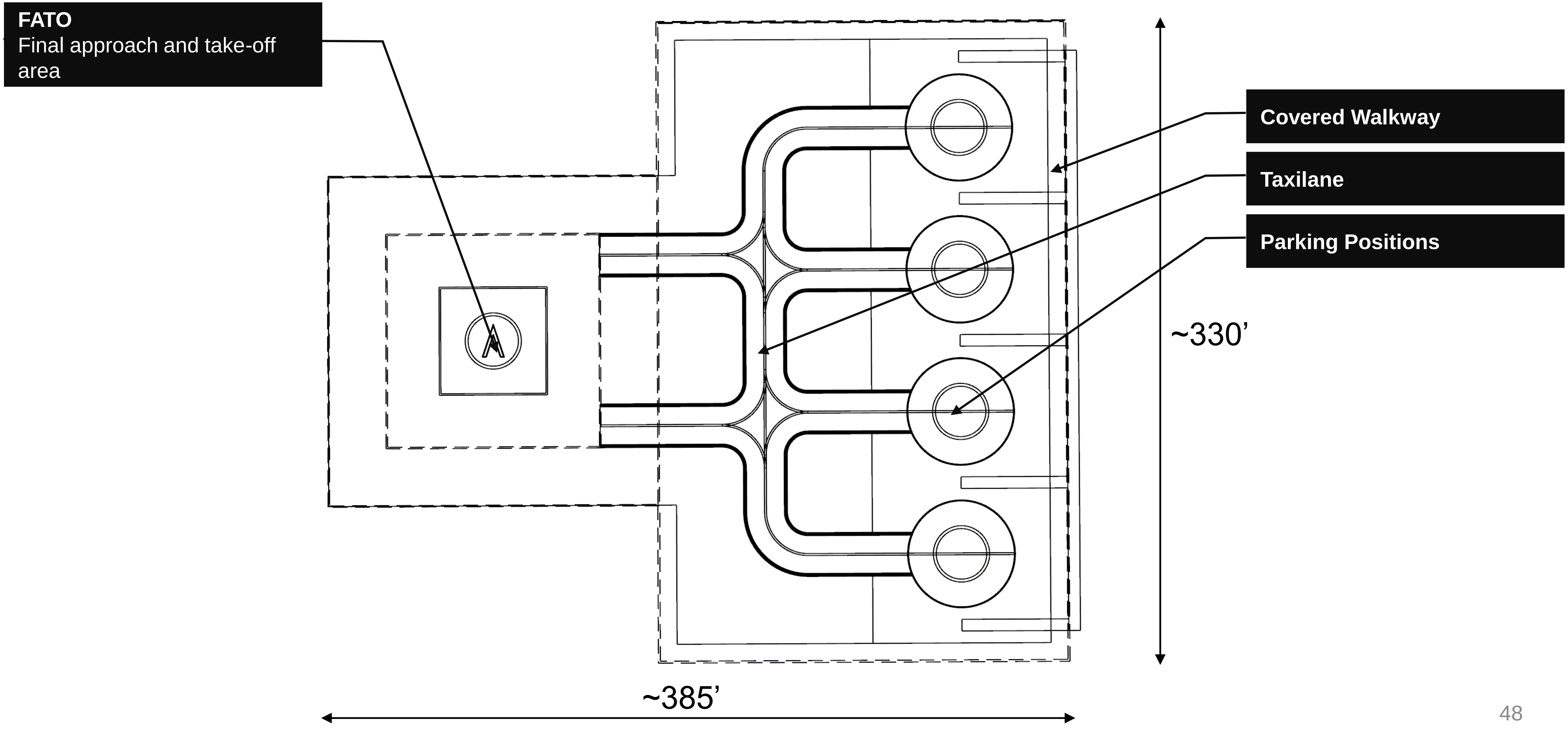
# Construction Phasing

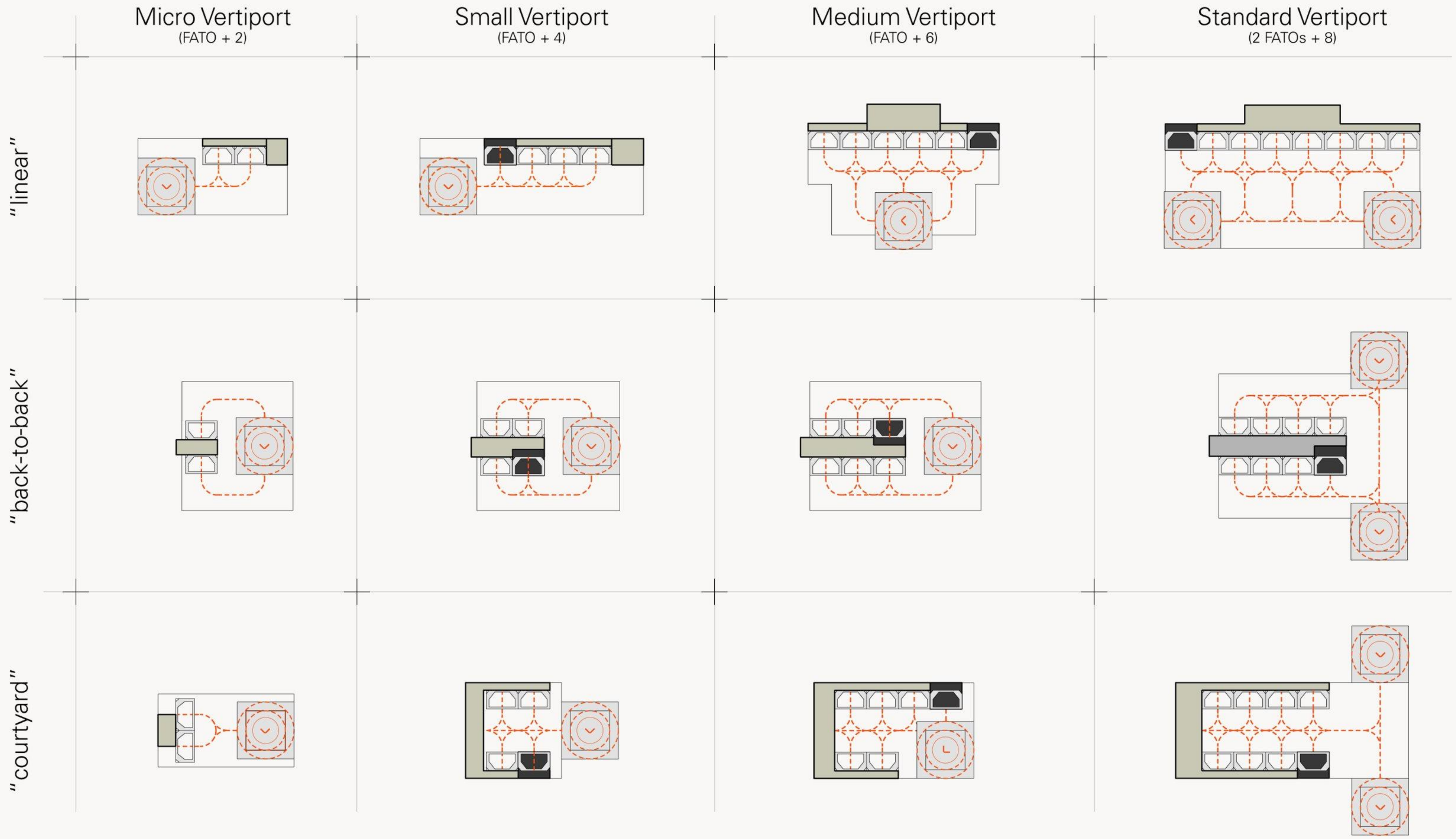


# Intro to Advanced Air Mobility

YEAGER AIRPORT

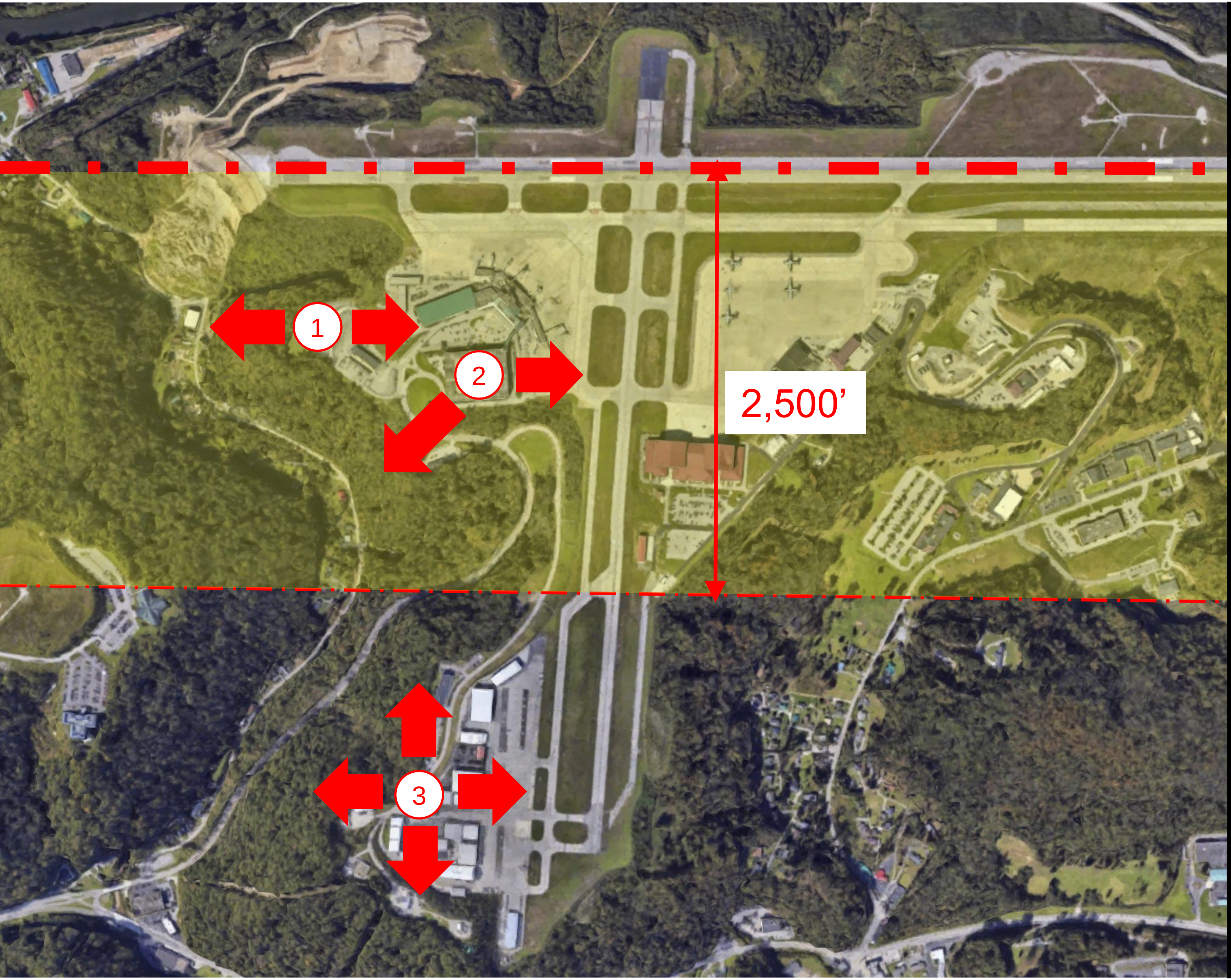
# Advanced Air Mobility





Micro Vertiport
(FATO + 2)
Small Vertiport
(FATO + 4)
Medium Vertiport
(FATO + 6)
Standard Vertiport
(2 FATOs + 8)
"linear"
"back-to-back"
"courtyard"

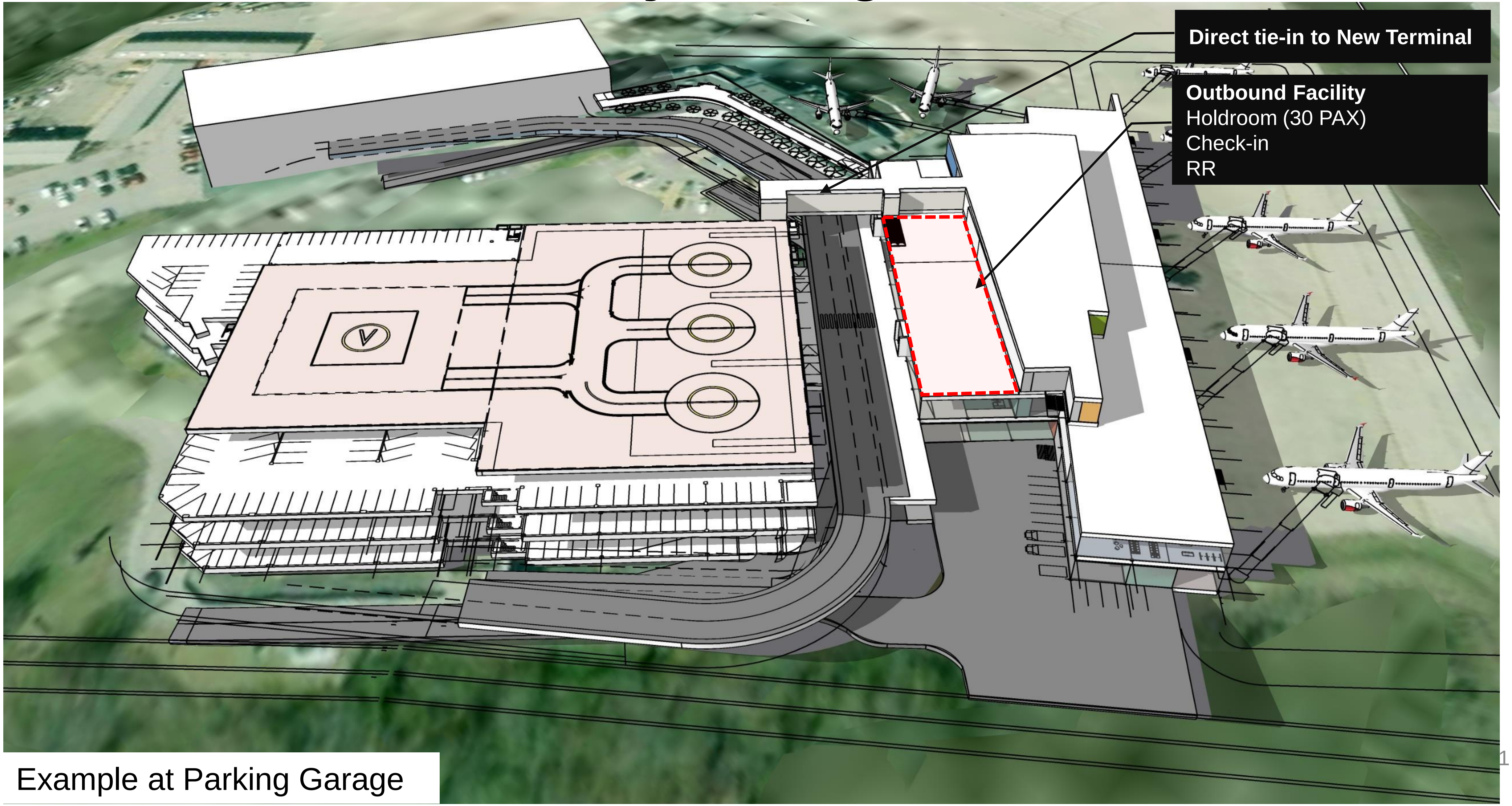
# Advanced Air Mobility - Opportunities




1. **Business Center / Hotel**
   - Consider walking distances
2. **Parking Garage**
   - Direct tie-in to facility
   - Potential fire dangers on existing garage
3. **GA Site**
   - Requires limo/busing operation

- *Sites within this 2,500' area may be subjected to wake impacts and air traffic controllers may provide wake warnings to eVTOL pilots prior to approach/take-off. While this does not preclude UAM operations, there may be an impact on UAM operations in terms of capacity and efficiency that may need to be considered.*

# Advanced Air Mobility - Integration




Example at Parking Garage

# Air Traffic Control Tower

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# Air Traffic Control Tower

- Oldest ATCT in U.S.
- Security issues with being co-located with terminal
- ATCT is airport-owned
    - If FAA builds a new tower they will gain ownership
    - ATCT is in all three BIL buckets; focus *may be* on FAA-owned ATCTs
- Possible triggers for ATCT relocation:
    - Part 77 issues – will runway project trigger ATCT relocation; could be included in EIS
    - Line of sight (LOS) over proposed terminal – L&B working on LOS height limitation to the new terminal
    - Possible structural issues that require terminal building to remain in place – needs investigated
- Goal is to keep ATCT relocation separate from terminal project for NEPA purposes

# ATCT Options

| Option | Pros | Cons |
|---|---|---|
| 1 – Build new ATCT and demolish entire terminal building | • No on-going maintenance of terminal building required | • Connector corridor required to access rental car facility<br>• Cost and time |
| 2 – Keep ATCT and demolish surrounding terminal portions | • Minimizes on-going maintenance of building | • Need to determine structural feasibility<br>• May need to address egress code issues<br>• Need to provide connector corridor to access rental car facility |
| 3 – Keep ATCT and maintain original building (demolish additions) | • More maintenance required than Option 2<br>• Building that remains can be used to access rental car facility | • May avoid egress code issues<br>• Partial connector corridor required to access rental car facility |

# Implementation (Environmental and Funding)

# Environmental Process

**Decide/Define**

- Terminal site plan
- Purpose & need
  - Level of service/space needs and/or
  - Taxiway A MOS
- Plans for existing terminal/ ATCT

**1 Month**

**FAA Coordination**

- Is Section 163 needed (go straight to NEPA?)
- EA vs CATEX
- Push for CATEX

**1 Month**

**NEPA**

- CATEX: 6-9 months
- EA: 12 months

**Timing depends on type of NEPA**

Proceed with Design at Risk

# Potential Terminal Funding Sources

| | Source | Description | Project Eligibility | Total Funding Available | CRW Amount |
|---|---|---|---|---|---|
| FAA | Entitlement Grants | Annual apportionment based on enplanements | 90% | ~ $2 million per year | ~ $2 million per year |
| FAA | Discretionary Grants | Discretionary amounts available after allocation of other AIP funds | 90% | Up to $20 million for non-hub airport terminals | $7.6 million per year avg. $38.1 million total 2017-2021 |
| FAA | Supplemental Grants | Funds derived from the General Fund and are not subject to existing AIP discretionary formulas or set-asides. | 90% | $400 million from FY 2021-2023 | $3.7 million in 2018 |
| FAA | Small Airport Fund (Eligible Mountaintop Airports) | Priority consideration to mass grading and associated structural support at mountaintop airports | 90% | Unknown | To be determined |
| Federal Relief Funds | CARES Act | The Coronavirus Aid, Relief, and Economic Security (CARES) Act | 100% | $10 billion total | $4.8 million ($1.9M already used) |
| Federal Relief Funds | CRRSA Act | Coronavirus Response and Relief Supplemental Appropriation Act | 100% | $2 billion total | $2.1 million ($2.1M already used) |
| Federal Relief Funds | ARP Act | American Rescue Plan Act | 100% | $8 billion total | $3.3 million ($194k already used) |

# Potential Terminal Funding Sources - Continued

| | Source | Description | Project Eligibility | Total Funding Available | CRW Amount |
|---|---|---|---|---|---|
| Bipartisan Infrastructure Law (BIL) | Airport Infrastructure Grants | Airport infrastructure funding allocated based on airport enplanements | Based on PFC Eligibility | $2.39 billion per year over 5 years<br>$20 million per year for | ~ $2.1 million per year<br>~ $10.5 million total |
| | Airport Terminal Program | Competitive grants for terminal development, ATCTs, and on-airport rail projects | 95% | $100 million per year for non-hub & non-primary airports over 5 years | To be determined |
| | FAA Facilities & Equipment | Funds for eligible for ATC facilities, fuel storage tank replacement, electrical systems, hazardous materials and environmental cleanup | 100% | $1 billion per year over 5 years | To be determined |
| | Transportation Infrastructure Finance and Innovation Act (TIFIA) | Provides access to low-interest loans and loan guarantees | 33% | 15% of annual TIFIA amounts for airports | To be determined |
| | Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant Program | Competitive grants for funding for eligible airport surface transportation projects that have a significant local or regional impact | 80% | $1.5 billion for 2022 (goes through FY 2026) | To be determined |

# Potential Terminal Funding Sources - Continued

| | Source | Description | Project Eligibility | Total Funding Available | CRW Amount |
|---|---|---|---|---|---|
| State of West Virginia | West Virginia Department of Transportation Aeronautics Commission | Airport infrastructure funding allocated based on airport enplanements | 5% FAA matching amount | $1.7 million in FY 2020<br>$525,000 in FY 2021 | $33,734 in 2020<br>$509,559 in 2021 |
| State of West Virginia | UNKNOWN AT THIS TIME | | | | |
| Local | UNKNOWN AT THIS TIME | | | | |

# Infrastructure Investment and Jobs Act – Airport Infrastructure Funding

**$15B**

**AIRPORT INFRASTRUCTURE GRANTS**

For Airport projects that increase safety and expand capacity

**$25 Billion Over 5 Years**

**$5B**

**AIRPORT TERMINAL PROGRAM**

To replace aging terminals and airports-owned towers, increase terminal energy efficiency and accessibility, and more.

**$5B**

**FAA FACILITIES AND EQUIPMENT**

To replace facilities and equipment and improve safety, security, and environmental standards

**CRW FY 2022 Airport Infrastructure Grants**

**$2.1 million**

# Summary Aviation Infrastructure Funding

| Funding Source | Description | Project Eligibility |
|---|---|---|
| **Airport Infrastructure Grants** | • $15 billion over 5 years<br>• $2.39B/year for primary airports<br>• $500M/year for general aviation airports<br>• $20M/year for airport-owned ATCT's | • Allocated based on enplaned passengers<br>• Project eligibility based on PFC regulations<br>• Requires local match |
| **Airport Terminal Program** | • $5 billion over 5 years, allocated to:<br>Large Hubs: 55%<br>Medium Hubs: 15%<br>Small Hubs: 20%<br>Non-Hubs and Non-Primary: 10% | • Competitive process<br>• For terminal development, ATCTs, and on-airport rail projects<br>• 80% eligibility for Large and Medium Hubs; 95% for other airports |
| **FAA Facilities and Equipment** | • $5 billion over 5 years<br>• $200M for FAA Contract Tower Program airports | • Eligible for ATC facilities, fuel storage tank replacement, electrical systems, hazardous materials and environmental cleanup |
| **Transportation Infrastructure Finance and Innovation Act (TIFIA)** | • 15% of annual TIFIA amounts from 2021-2026 for airports<br>• Access to low-interest loans and loan guarantees | • Project eligibility based on PFC regulations<br>• Up to max of 33% eligible project costs<br>• Buy America |

# BIL Facilities and Equipment Grants – FY22

- $1B total
- Provided for (*most relevant to terminal/tower program*):
  - Replacing terminal and en route air traffic control facilities
  - Improving air route traffic control center and combined control facility buildings
  - Improving air traffic control en route radar facilities
  - Improving air traffic control tower and terminal radar approach control facilities
  - National airspace system facilities OSHA and environmental standards compliance
  - Facility security risk management
- Carve out for FAA owned and contract staffed towers (not all)
- Detailed spending plan established by Secretary 90 days after enactment listing project locations and ATCs. Future year spending plans to be determined.

# BIL Airport Infrastructure Grants – FY22

- $3B total; CRW allocation $2.1MM
  - Additional guidance anticipated May 2022
  - Apportionment for FY22 (and FY23) determined on airport passenger enplanements for calendar year 2019
- Any funds made available in a given year must be obligated by the end of the fourth year after which they were made available
- Remaining unobligated funds will be competitive grants, prioritized by reduction of airport emissions, noise impact, dependence on electrical grid or general benefits to the community
- May not be used to pay debt service (as were stimulus funds)
- Not subject to any limitations on obligations provided in any Act making annual appropriations (e.g., not offset by AIP discretionary)

# BIL Airport Terminal Program (ATP) Grants – FY22

- $1B total; Competitive process (*see priorities next slide*)
    - Notice of Funding Opportunities (NOFO) guidance expected in February (not later than 60 days after enactment)
    - Not less than 10% shall be available to non-hub and non-primary airports (approximately 195 non-hub and 107 non-primary airports; but how many to compete is undetermined)
- FAA asking airports to update their 5-year CIPs in anticipation of the Program's implementation. Deadlines for submittal of the revised CIPs are by mid- to late-March
    - 5-year CIP should include funding desired from all federal sources (entitlement, discretionary, AIG, FTP, FCT, etc.)
    - FAA has indicated that all airside needs should be prioritized over other projects

# BIL Airport Terminal Program (ATP) Grants Cont.

- Consider projects that qualify as "terminal development"
  - And projects for "relocating, reconstructing, repairing, or improving an **airport-owned** air traffic control tower"
- Preference to projects that achieve a "complete development objective, even if awards for the project must be phased"
- Specific needs for supporting documentation for BIL projects (e.g., FAA approved NEPA documents, benefit-cost analyses, and airport layout plans, etc.), and the ability to utilize design-build and construction management at risk delivery methods and Build America requirements are unknown at this time

# FAA Priorities For Airport Terminal Program Grants

| PRIORITY | COMMENTS | APPLICABILITY TO CRW |
|---|---|---|
| **Improve airfield safety through terminal relocation** | • Current gates are penetration to Part 77 transitional surface<br>• Current gate locations preclude ability to retire Taxiway A MOS | ✓ |
| **Replacing aging facilities** | • Original terminal was built in 1950s; renovated/expanded in multiple phases over time<br>• Existing building is unable to efficiently accommodate future growth and technologies due to age and complicated structural grid (multiple additions over time) | ✓ |
| **Increase capacity and passenger access** | • Provides ability to accommodate larger aircraft holdroom gates<br>• Provides ability to meet 20-year demand<br>• Allows for installation of CAT equipment in security checkpoint | ✓ |
| **Encourage competition** | • Encourages competition through expanded terminal/gate capacity and ability to continue to expand as needed | ✓ |
| **Improve energy efficiency (including LEED accreditation)** | • Provides ability for sustainable design<br>• Efficient building systems and reduced electrical loads with increased daylighting | ✓ |
| **Expand access for persons with disabilities** | • Current terminal includes multiple vertical transitions that do not meet ADA standards<br>• Non-secure restaurant does not have standard ramp access for wheelchairs<br>• Eliminate security checkpoint queue area on a sloped surface<br>• New terminal facility will be built to ADA standards | ✓ |
| **Improving airport access for historically disadvantaged populations *** | • New terminal will improve access to disadvantaged populations by increasing competition and air service at the Airport<br>• WV ranks as the 2nd poorest state, with a $48,850 median household income and 4th poorest with a poverty rate of 17.6%.<br>• Charleston ranks 7th in the State with 20.9% of individuals living below the poverty line | ✓ |



* Unesco Institute for Statistics definition: A population group at risk of education exclusion as a result of sex, location, poverty, disability, ethnicity, language, migration, displacement or other characteristics

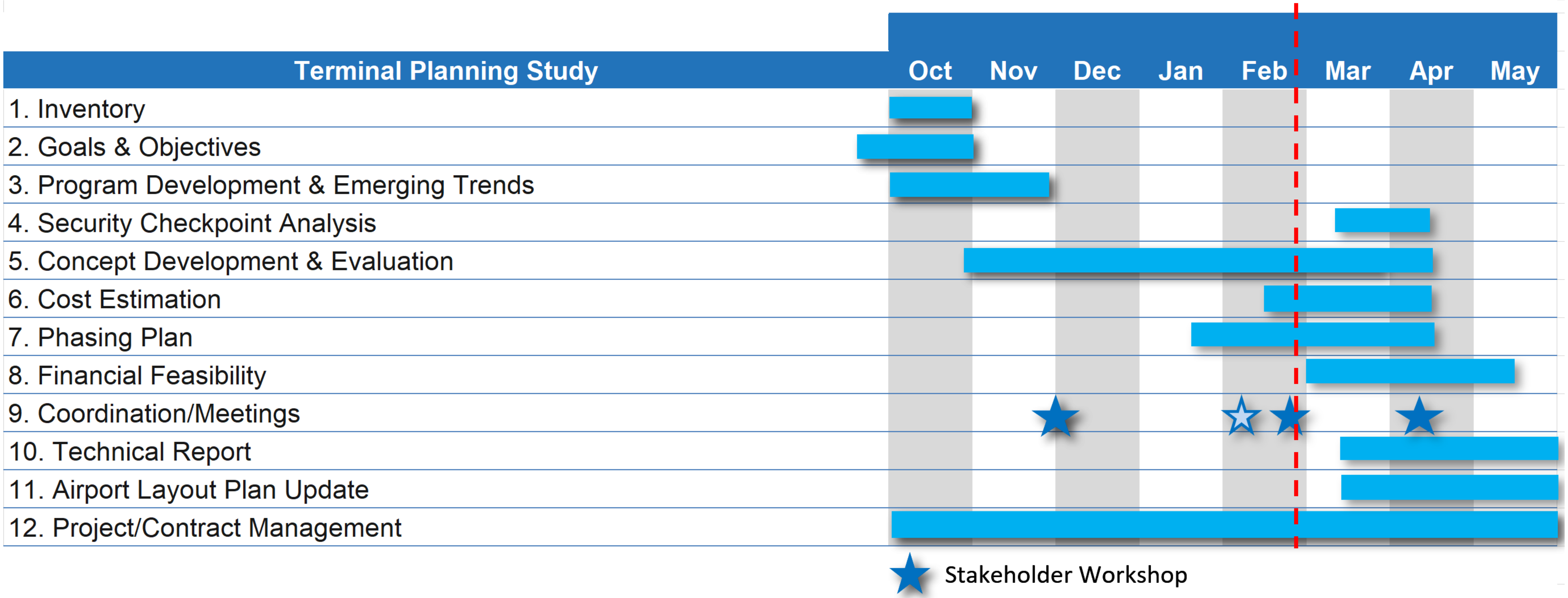
# Next Steps

# Next Steps

- Finalize site plan and phasing
- Refine costs and develop estimates for each phase
- Identify potential funding sources for each phase
- Identify what part of terminal building may need to remain to support ATCT in existing terminal
- Next workshop:
  - Meeting timing depends on timing of BIL terminal competition guidance
  - Package project costs by phase with potential funding sources
  - Present plan with 3D renderings to elected officials and media
- Document and ALP update

# Next Steps

## CRW Terminal Planning Study



# TO 1401 – Terminal Planning Study
## Stakeholder Workshop

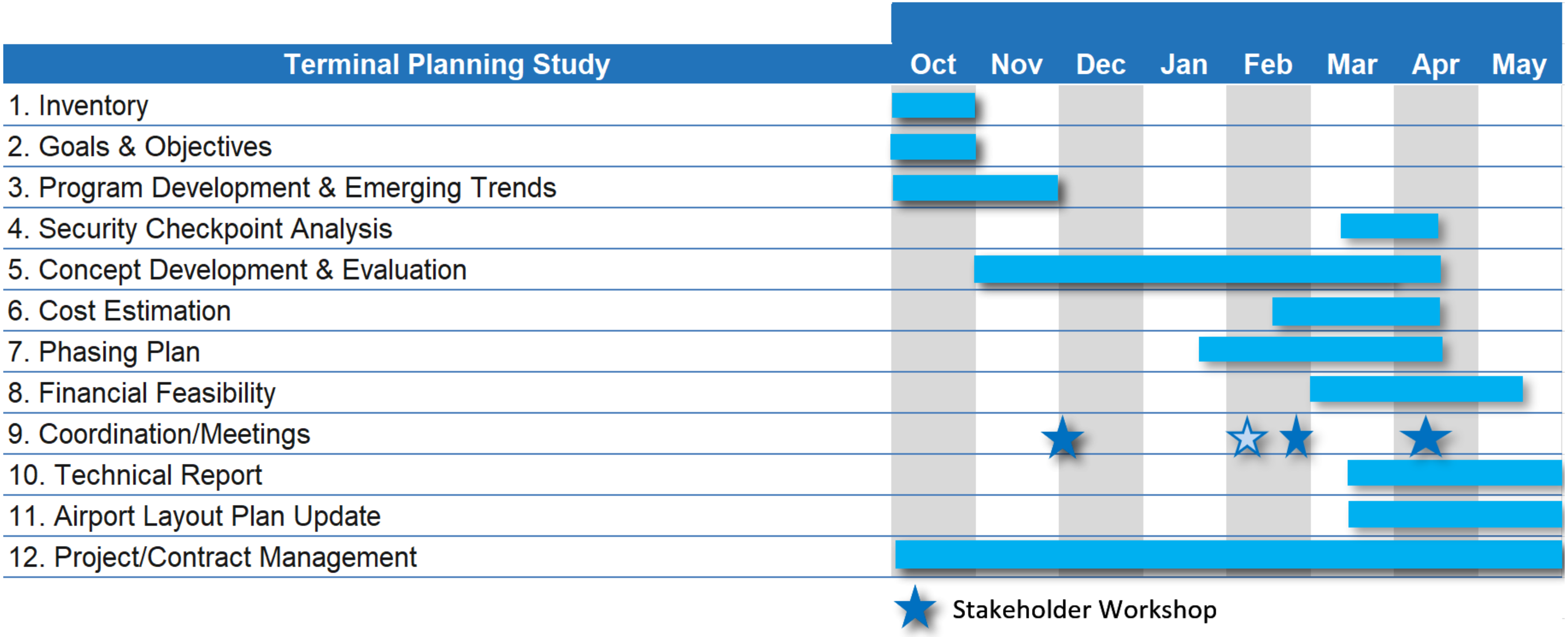
Landrum & Brown | April 26 - 27, 2022

# Agenda

- Background
  - Study Process & Meetings
  - Forecast / Program
  - Concept Evolution
- Recommended Concept
  - Terminal Floorplans
  - Renderings
  - Cost
  - Benefits
  - Implementation Schedule

# Background

# Study Process



# Study Process

| 1. Airport Analysis | 2. Terminal Planning | 3. Project Documentation |
|---|---|---|
| Inventory | Concept Development & Evaluation | Coordination/Meetings |
| Goals & Objectives | Cost Estimation | Technical Report |
| Program Development & Emerging Trends | Phasing Plan | Airport Layout Plan Update |
| Security Checkpoint Analysis | Financial Feasibility | Project/Contract Management |

# Forecast / Program

# Forecast

| Scenario | Year | Annual Passengers | Annual Commercial Ops | Gate Requirement |
|---|---|---|---|---|
| Existing | 2021 | 334,000 | 6,878 | 5 |
| Master Plan Base Case | 2037 | 625,898 | 12,588 | 6 |
| Master Plan High Case | 2037 | 707,270 | 13,665 | 7 |

- Program based on 7 preferential use gates.

# IATA Level of Service (LOS)

IATA metrics are the basis for space programming and define the amount of square footage needed per passenger to maintain an Optimum LOS:

| LoS Guidelines | | SPACE GUIDELINES [sqm/PAX] | | | MAXIMUM WAITING TIME GUIDELINES Economy Class [minutes] | | | MAXIMUM WAITING TIME GUIDELINES Business Class / First Class / Fast Track [minutes] | | | OTHER GUIDELINES & REMARKS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LoS Parameter: | Over-Design | Optimum | Sub-Optimum | Over-Design | Optimum | Sub-Optimum | Over-Design | Optimum | Sub-Optimum | Over-Design | Optimum | Sub-Optimum |
| **Public Departure Hall** | | >24.8 | 21.5-24.8 | <21.5 | n/a | | | n/a | | | Optimum proportion of seated occupants: 15-20%* | | |
| **Check-In** | Self -Service Kiosk (Boarding Pass / Bag Tagging) | >19.4 | 14.0-19.4 | <14.0 | <1 | 1-2 | >2 | <1 | 1-2 | >2 | | | |
| | Bag Drop Desk (queue width: 1.4- 1.6m) | >19.4 | 14.0-19.4 | <14.0 | <1 | 1-5 | >5 | <1 | 1-3 | >3 | | | |
| | Check-in Desk (queue width: 1.4- 1.6m) | >19.4 | 14.0-19.4 | <14.0 | <10 | 10-20 | >20 | <3 | Business Class 3-5 | >5 | | | |
| | | | | | | | | <1 | First Class 1-3 | >3 | | | |
| **Security Control** (queue width: 1.2m) | | >12.9 | 10.8-12.9 | <10.8 | <5 | 5-10 | >10 | <1 | First Track 1-3 | >3 | | | |
| **Gate Holdrooms** | Seating | >23.7 | 19.4-23.7 | <19.4 | n/a | | | n/a | | | Optimum proportion of seated occupants: 50-70%* | | |
| | Standing | >16.1 | 12.9-16.1 | <12.9 | | | | | | | | | |
| **Baggage Reclaim** | Narrow Body Aircraft | >18.3 | 16.1-18.3 | <16.1 | <0 | 0/15 | >15 | <0 | 0/15 | >15 | The first waiting time value relates to "first passenger to first bag". The second waiting time value related to "last bag on belt" (counting from the first bag delivery).** | | |
| | Wide Body Aircraft | >18.3 | 16.1-18.3 | <16.1 | <0 | 0/25 | >25 | | | | | | |
| **Public Arrival Hall** | | >24.8 | 21.5-24.8 | <21.5 | n/a | | | n/a | | | Optimum proportion of seated occupants: 15-20%* | | |

# Program of Requirements

## Parameters

| Space Designation | |
|---|---|
| **Check-in** | **Domestic** |
| **Passengers** | |
| Ratio of Pax in Business/First Class | 10% |
| Ratio of Self Check Passengers (kiosks) | 40% |
| Ratio of Passengers Using Traditional Check-in Facilities | 40% |
| Ratio of Passengers Using Home Check-in (App check-in) | 20% |
| Ratio of Total Passengers Using Bag Drop | 35% |
| Additional Counters to Account for Schedule Changes | 15% |
| **Self Service Kiosks** | |
| Average Process Time per Pax (in seconds) | 80 |
| Maximum Queuing Time (in minutes) | 3 |
| Area Required per Kiosk Including Queue | 50 |
| **Bag-Drop** | |
| Average Process Time per Pax (in seconds) | 60 |
| Maximum Queuing Time (in minutes) | 5 |
| **Traditional Check-in** | |
| Average Process Time per Pax (in seconds) | 90 |
| Maximum Queuing Time (in minutes) y class | 20 |
| Maximum Queuing Time (in minutes) j class | 5 |
| Maximum Queuing Time (in minutes) f class | 5 |
| **Security** | |
| **Departure Screening** | |
| Standard | 75% |
| TSA Pre | 25% |
| % Additional Traffic (employees, crew) | 10% |
| Process (throughput) Time per Passenger at Security (in seconds) | 24 |
| Maximum Queuing Time (in minutes) | 10 |
| Support Areas as % Security Hall | 17% |

| **Baggage Claim** | |
|---|---|
| Average Claim Device Occupancy per Code C (in minutes) | 30 |
| Length of Bag Claim Exposure to Passengers per Code C (LF) | 150 |
| Area per Incline Type Unit for Code C | 4200 |
| **Baggage Drop-off** | |
| Area per Unit for Code C (SF) | 1650 |
| **Gate Lounges** | |
| Individual Lounges | |
| Area per Large NB | 3000 |
| Area per Small NB | 1560 |
| **Concessions** | |
| Area per Million Passengers | 8000 |
| Total Retail | 45% |
| Retail Airside | 90% |
| Retail Landside | 10% |
| Total F&B | 55% |
| F&B Airside | 90% |
| F&B Landside | 10% |
| **Concession Support** | |
| % of Total Concessions for Storage (25% -35% typical) | 10% |
| **Support** | |
| **Airline Operations** | |
| Area per EQA | 1000 |
| **Airline Ticket Offices** | |
| Area per EQA | 58 |
| **Airline Baggage Service Offices** | |
| Area per Terminating Peak Hour Passenger | 1.50 |
| **Airport Operations** | |
| Area per EQA | 600 |
| **Mechanical / Electrical (as percent of Total Building)** | 10% to 12% |
| **Vertical Circulation** | 0% to 5% |
| **Miscellaneous (Two Level)** | 0% to 10% |

# Program

| Space Designation | Existing | | Program 2037 High | |
|---|---|---|---|---|
| | Unit | SF | Unit | SF |
| Check-in | 16 | 5,074 | 12 | 4,010 |
| Airline Offices | | 3,297 | | 1,050 |
| Baggage Make-up / Drop-off | | 5,263 | | 26,360 |
| CBIS/CBRA Checked Bag Screening | | 1,938 | | 7,200 |
| Baggage Claim | 1 | 3,873 | | 8,450 |
| Holdrooms | | 14,410 | | 13,800 |
| Business Lounge | | | | 5,220 |
| Airline Operations | | 1,166 | | 7,760 |
| Non-Secure Circulation / Lobbies | | 13,497 | | 8,414 |
| Secured Circulation | | 3,486 | | 29,187 |
| Restrooms | | 3,592 | | 5,750 |
| Security Screening Check Point | 2 | 1,813 | 2 | 5,400 |
| TSA Offices | | 2,391 | | 920 |
| Concessions | | 4,434 | | 6,260 |
| Airport Operations / Administration | | 11,233 | | 11,733 |
| Tenant Spaces | | 13,451 | | |
| Vertical Circulation | | 4,568 | | 4,060 |
| MEP/Support | | 5,689 | | 16,210 |
| Loading Dock | | | | 750 |
| **Total Areas** | | **99,175** | | **162,534** |
| Terrace | | | | |

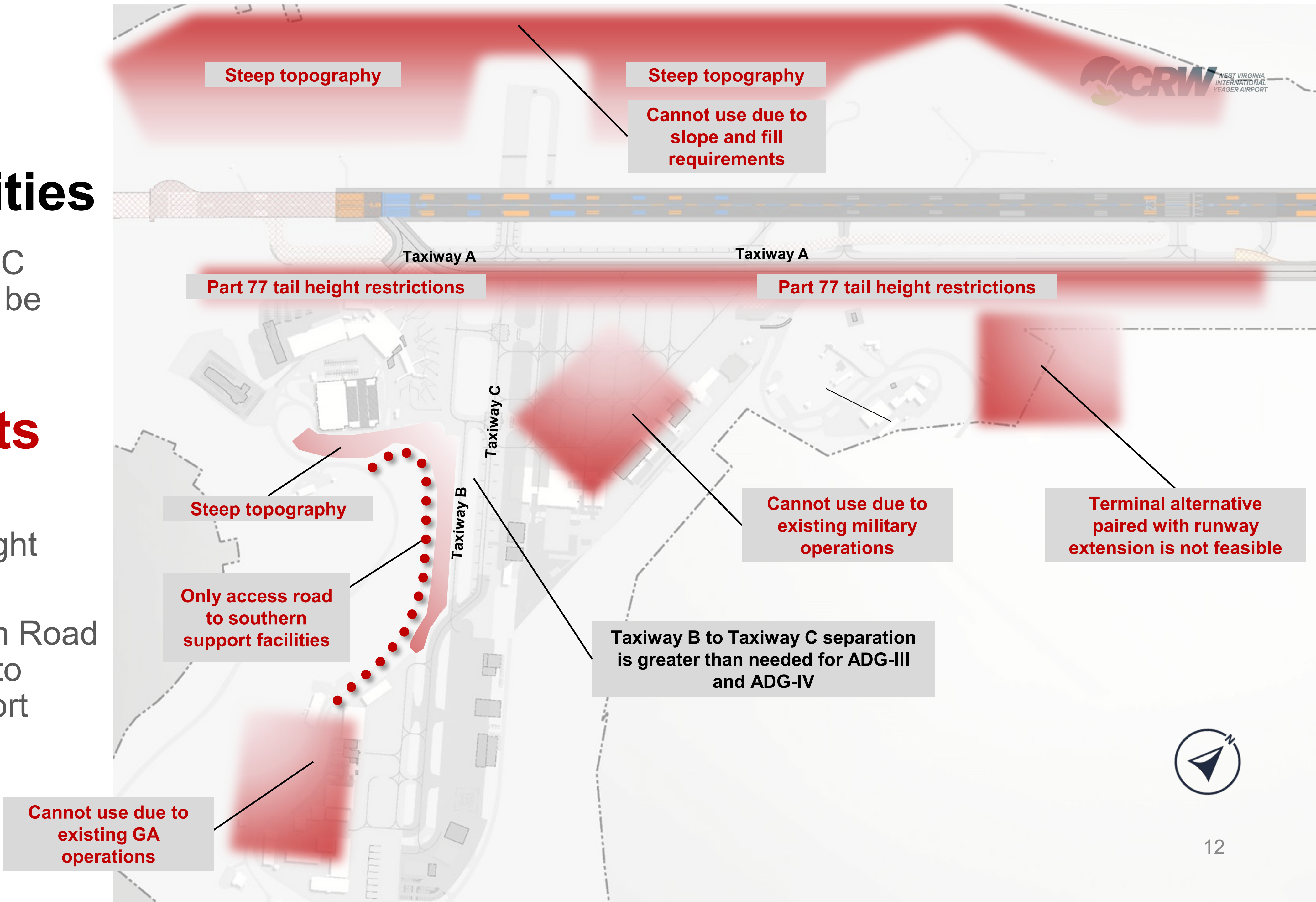
# Concept Evolution

# Opportunities

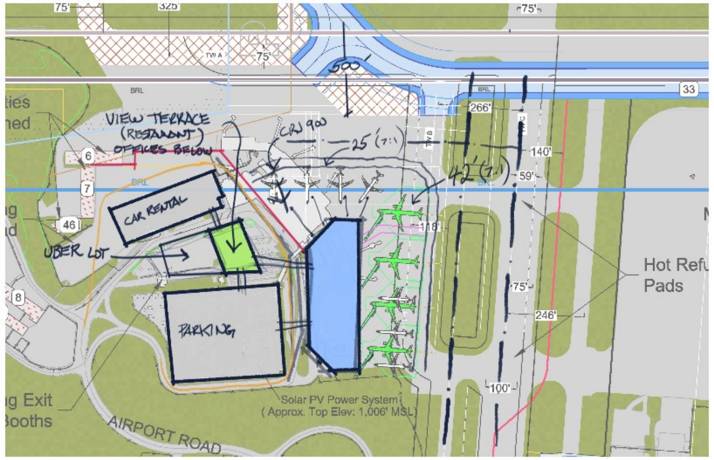
- Taxiway B and C separation can be reduced

# Constraints

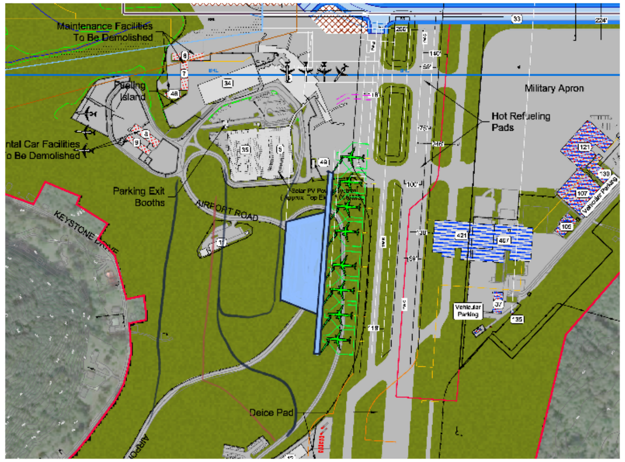
- Topography
- Part 77 tail height restrictions
- Eagle Mountain Road is only access to southern support facilities



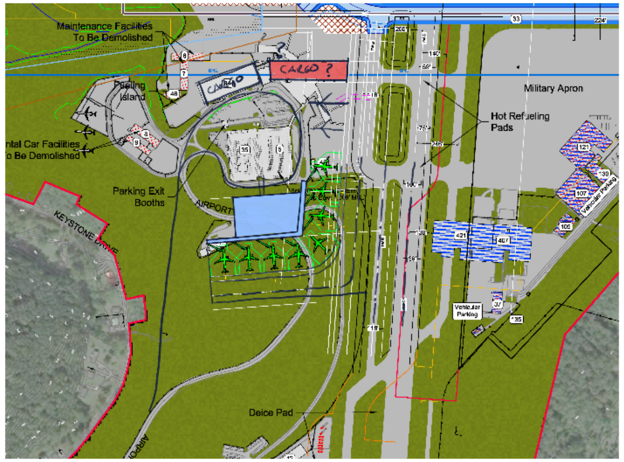
# Terminal Concepts Within Existing Area



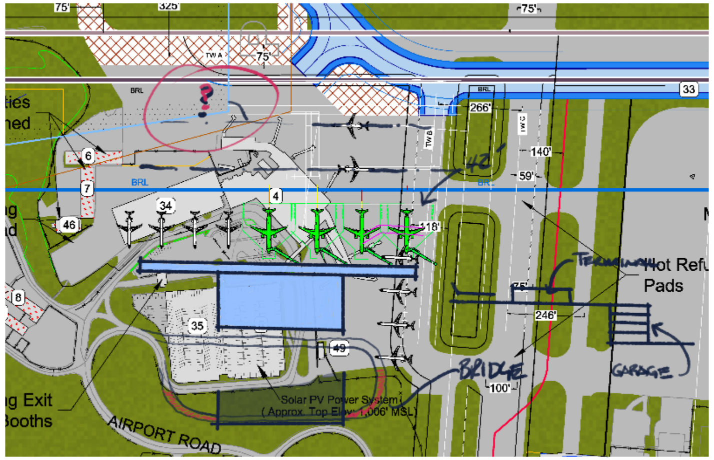

Alternative 1



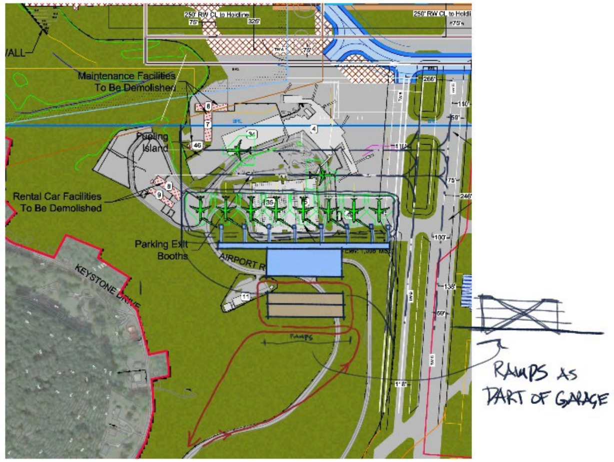

Alternative 2




Alternative 3

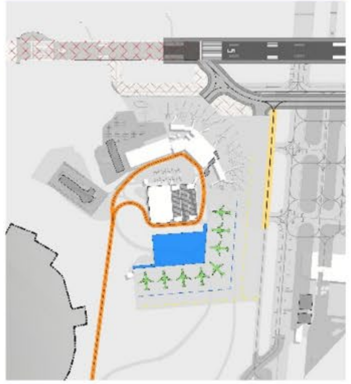
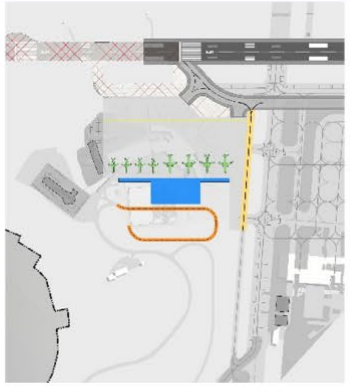
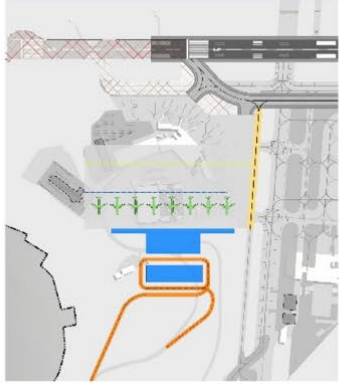



Alternative 4




Alternative 5

# Site Selection Process

| Evaluation Alternatives / Criteria | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| Fill Requirement | | | | | |
| Use of Existing Structures | | | | | |
| Apron / Taxilane Configuration | | | | | |
| Expandability | | | | | |
| Phasing / Impact to Operations | | | | | |
| Access Road Impacts | | | | | |

Excellent
Good
Average
Poor

# New Terminal Concepts

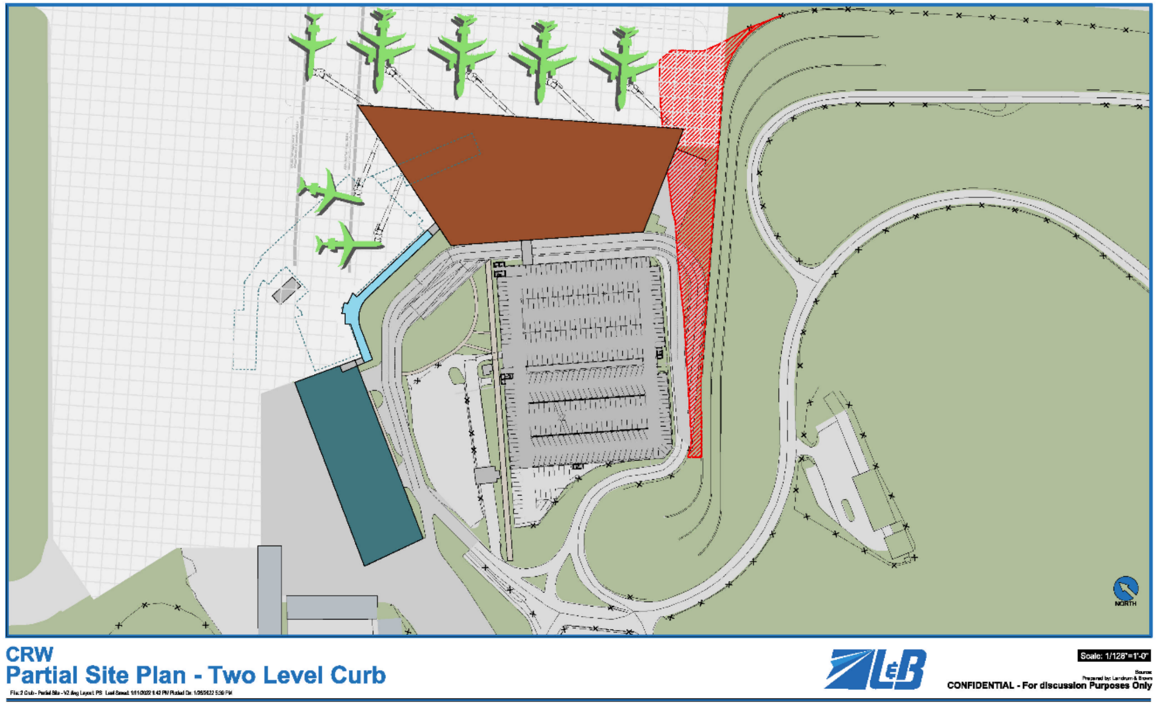
Maximum Envelope

Simple Rectangle

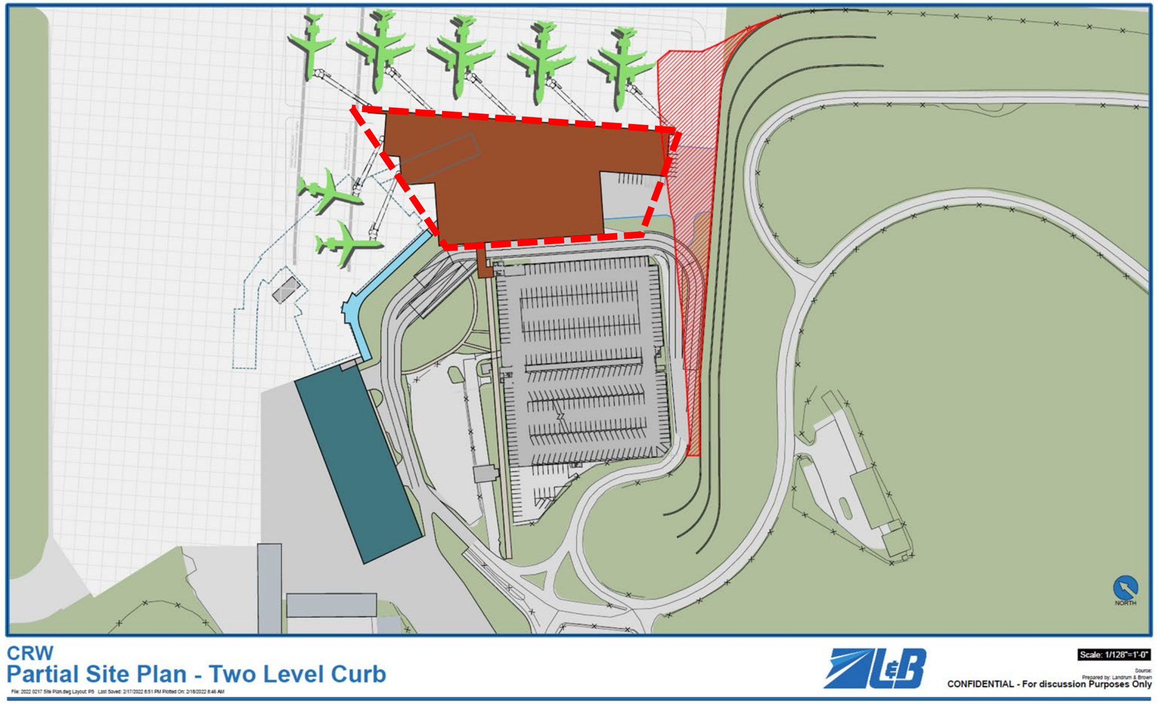
Hybrid

# Terminal Footprint Optimization

Original

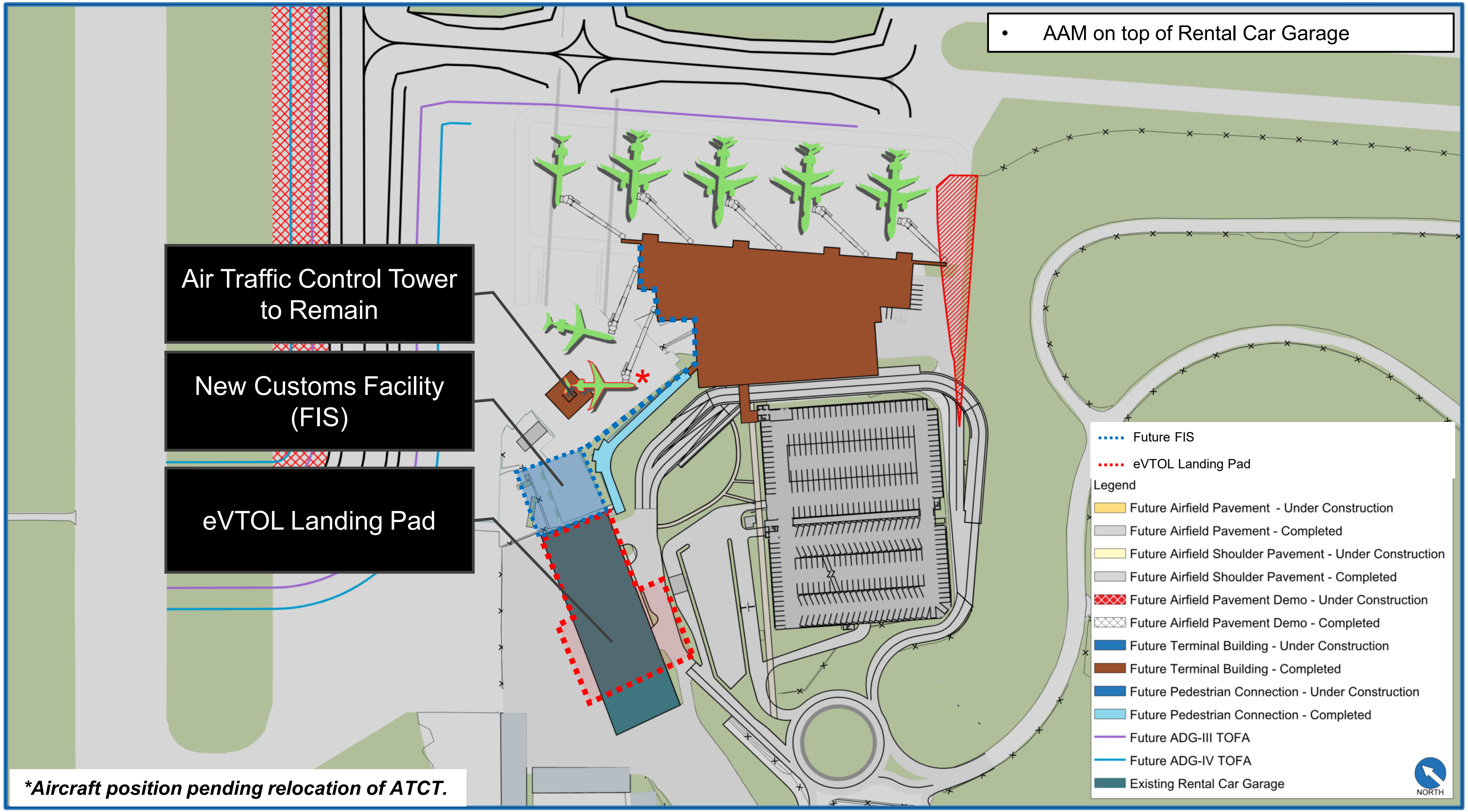



Optimized




- Improved building layout to reduce cost
    - Removed excess program
    - Optimized building structural grid
    - Improved passenger flows and building functions

# Recommended Concept



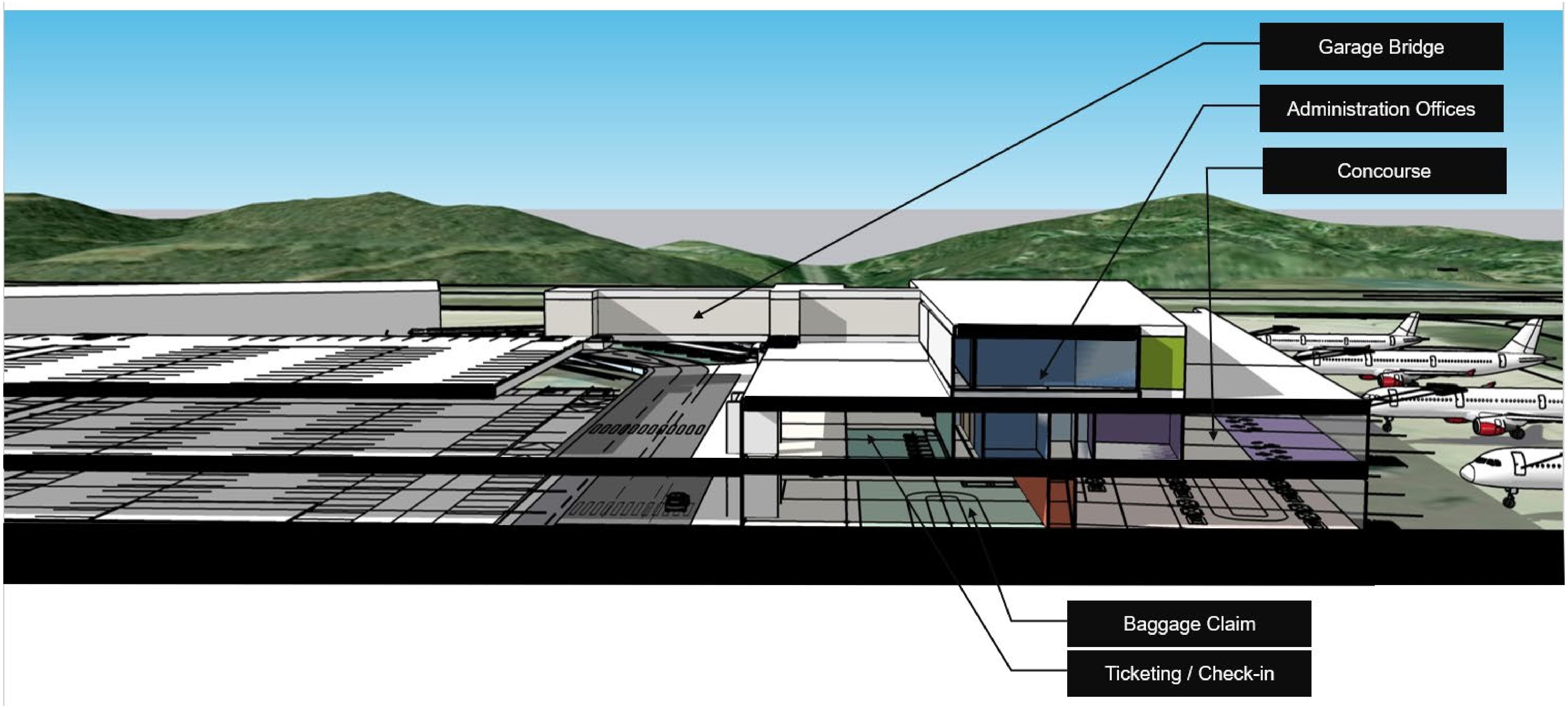

**CRW**
**New Terminal - Phase 5c**

File: 2022 0311 Site Plan.dwg Layout: Phase 5c Last Saved: 3/11/2022 3:04 PM Plotted On: 3/11/2022 3:41 PM

Scale:1" = 150'

Source:
Prepared by: Landrum & Brown
**CONFIDENTIAL - For discussion Purposes Only**

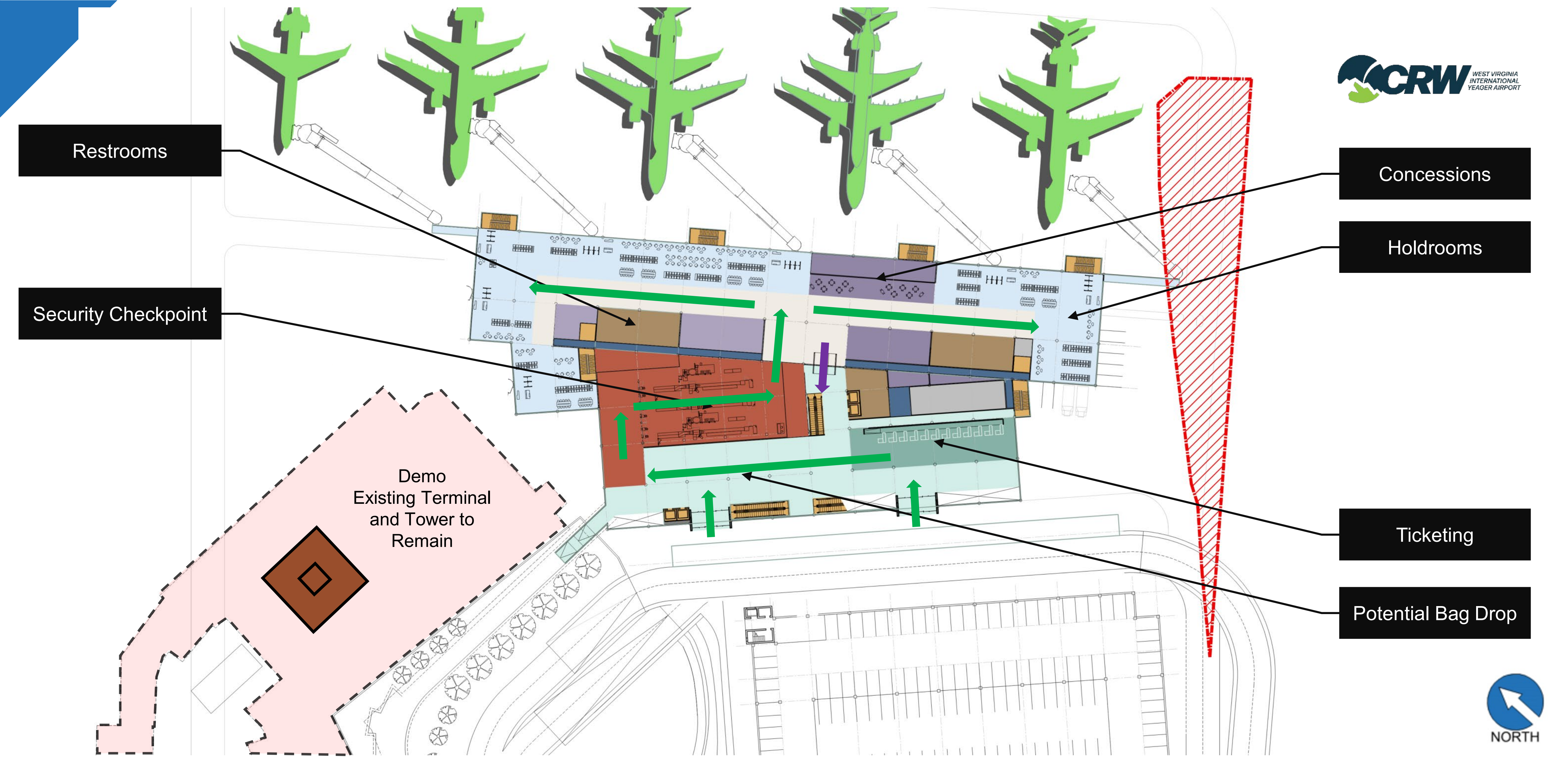
# Section



Garage Bridge
Administration Offices
Concourse
Baggage Claim
Ticketing / Check-in


# CRW
## Third Floor – Phase 05B

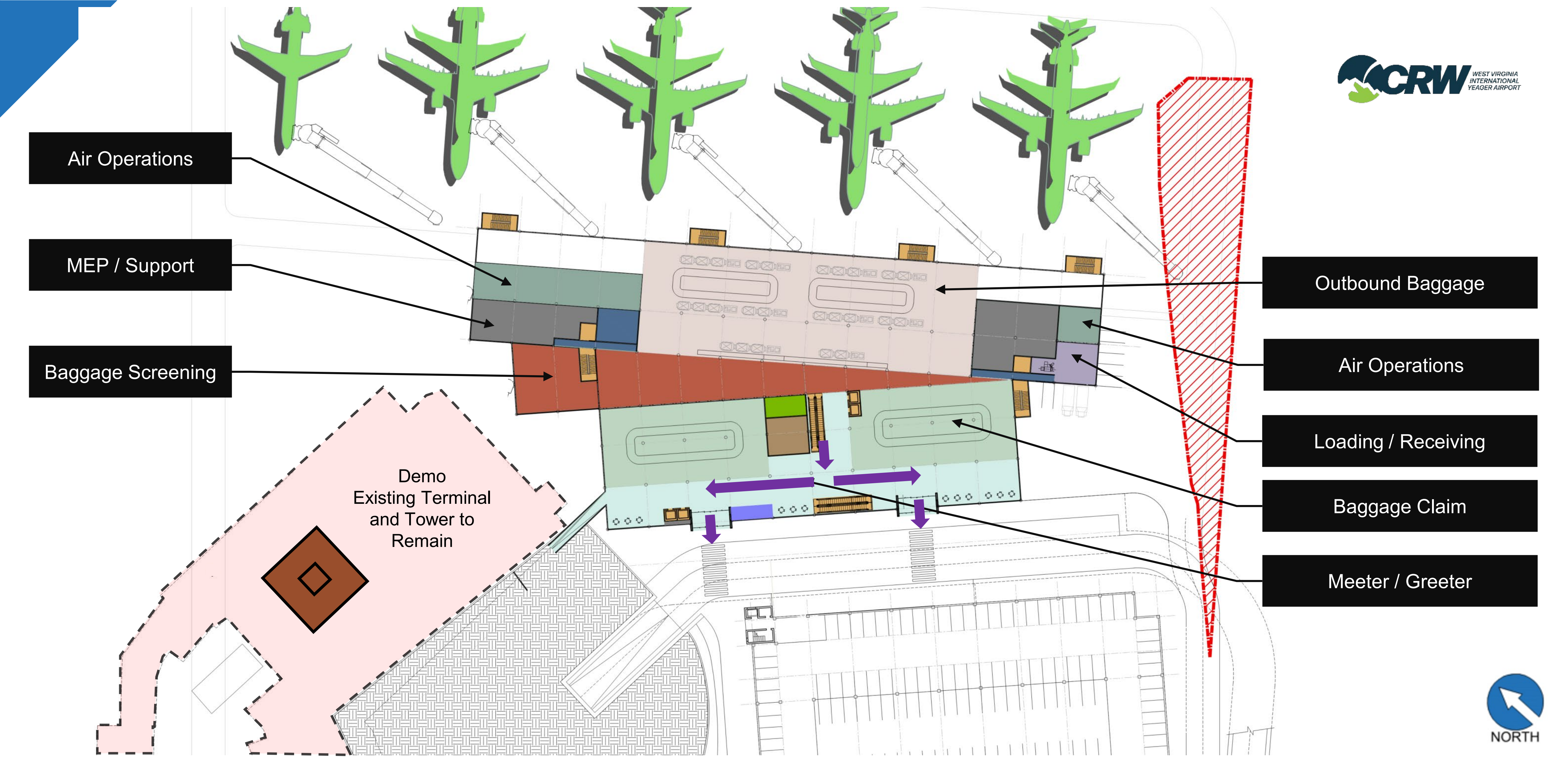
**Legend**
- Restrooms
- Airport Operations
- Vertical Circulation
- Support or MEP
- Secure Circulation
- Outdoor Terrace




# CRW
## Second Floor – Phase 05B

**Legend**

- Restrooms
- Airport Operations
- Checkpoint
- Concession Support
- Secure Circulation
- Non-Secure Circulation
- Concessions
- Holdrooms
- Vertical Circulation
- Support or MEP
- Check-In
- ATO




# CRW
## First Floor – Phase 05B

**Legend**

- Restrooms
- Airport Operations
- BSO
- Baggage Make Up
- Secure Circulation
- Non-Secure Circulation
- Vertical Circulation
- Support or MEP
- Claim Area
- Airline Operations
- Amenities
- Loading Dock
- Inbound Baggage

CRW WEST VIRGINIA INTERNATIONAL YEAGER AIRPORT

# Renderings

# Aerial View

CRW WEST VIRGINIA INTERNATIONAL YEAGER AIRPORT

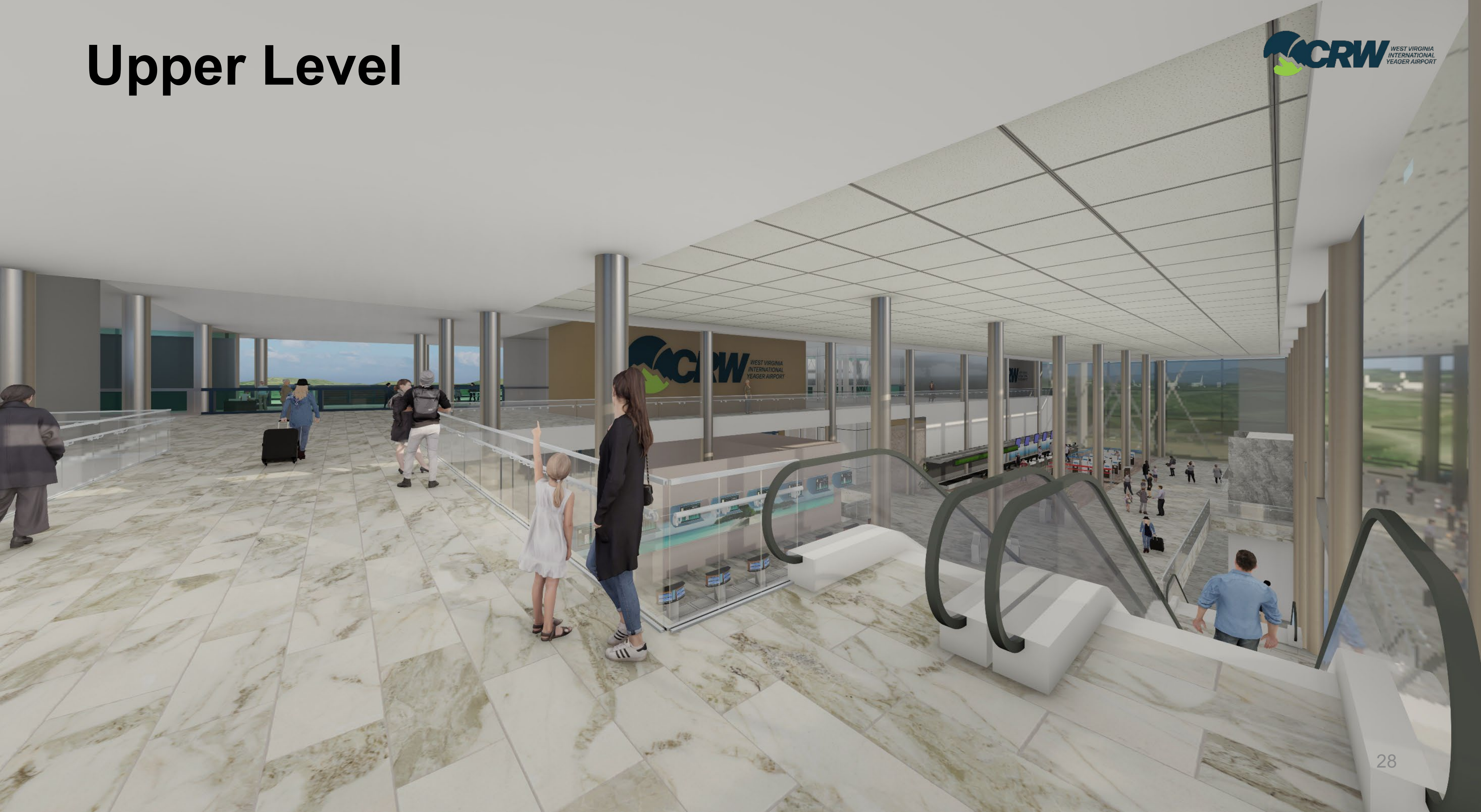
# Aerial View

# Holdrooms

CRW WEST VIRGINIA INTERNATIONAL YEAGER AIRPORT

# Ticketing

# Upper Level



# Cost

# ATP Eligibility vs. Maximum Eligibility

- ATP eligibility was based on a 95% matching level for all eligible project costs
  - **RESULT:** Up to $213.7 million could be eligible for ATP funds; $40.2M would be ineligible

- Maximum eligibility was based on PFC eligibility guidelines for terminal space (PFCs can be used to pay for up to 100% of PFC eligible space)
  - **RESULT:** Up to $222.5 million could be eligible for PFC funds; $31.4M would be ineligible

# Terminal Program Cost Summary & ATP Eligibility

- Total Program Cost - $253,900,000
- ATP eligibility was based on a 95% matching level for all eligible project costs
  - Up to $213.7 million could be eligible for ATP funds

| Phase | Construction Cost | Design Cost | Total Cost by Phase | ATP Eligible Share * | Local Share * |
|---|---|---|---|---|---|
| **Phase 1** | $ 9.6 M | $ .7 M | $ 10.3 M | **$ 9.8 M** | $ .5 M |
| **Phase 2** | **$ 36.0 M** | **$ 3.3 M** | **$ 39.2 M** | **$ 33.1 M** | **$ 6.1 M** |
| **Phase 3** | $ 32.3 M | $ 2.9 M | $ 35.2 M | **$ 28.3 M** | $ 6.9 M |
| **Phase 4** | **$ 63.3 M** | **$ 5.8 M** | **$ 69.1 M** | **$ 54.8 M** | **$ 14.3 M** |
| **Phase 5** | $ 91.8 M | $ 8.3 M | $ 100.1 M | **$ 87.7 M** | $ 12.4 M |
| **Total** | **$ 232.9 M** | **$ 21.0 M** | **$ 253.9 M** | **$ 213.7 M** | **$ 40.2 M** |

**Note:** Eligible project costs are subject to further refinement in the future.

* ATP eligibility is based on PFC guidelines for eligible terminal space and 95% matching level for BIL ATP funds. Matching level for regular FAA AIP grants are different than the BIL ATP matching level (95% vs. 90%).

# Analysis of Maximum Eligibility

- Maximum eligibility analysis was based on PFC eligibility guidelines for terminal space
- Eligibility for Terminal and Terminal-related projects was based on an analysis of eligible and ineligible terminal space
  - According to PFC guidelines (FAA Order 5500.1), terminal development projects directly related to the movement of passengers and baggage through non-revenue producing public-use areas are eligible for PFC funding. Public use spaces are those areas that passengers may need to occupy as part of their air travel.
- Depending on funding source, eligible terminal space can be funded up to the following levels:
  - Up to 100% with PFCs (Maximum Eligibility)
  - Up to 95% matching with BIL ATP funds
  - Up to 90% matching with regular FAA AIP Entitlement or Discretionary grants

# Analysis of Maximum Eligibility – Phase 1

| Project Element | Phase 1 Cost | Phase 1 Max Eligible % | Phase 1 Max Eligible Amount | Phase 1 Ineligible Amount | TOTAL TERMINAL COST Cost | TOTAL TERMINAL COST Max Eligible % | TOTAL TERMINAL COST Max Eligible Amount | TOTAL TERMINAL COST Ineligible Amount |
|---|---|---|---|---|---|---|---|---|
| Design | $0.7 | 87.2% | $0.6 | $0.1 | $21.0 | 88.0% | $18.5 | $2.5 |
| Terminal Building | | 84.3% | | | 109.3 | 84.7% | 92.5 | 16.8 |
| Loading Bridges | | 100.0% | | | 4.2 | 100.0% | 4.2 | 0.0 |
| Airfield & Apron | 1.8 | 100.0% | 1.8 | 0.0 | 12.3 | 100.0% | 12.3 | 0.0 |
| Enabling Projects | 0.9 | 84.3% | 0.7 | 0.1 | 8.7 | 88.2% | 7.7 | 1.0 |
| Roadway | | 100.0% | | | 7.3 | 100.0% | 7.3 | 0.0 |
| Utilities | 2.6 | 84.3% | 2.2 | 0.4 | 3.3 | 84.1% | 2.8 | 0.5 |
| Miscellaneous | 4.3 | 87.2% | 3.8 | 0.6 | 87.8 | 88.0% | 77.3 | 10.5 |
| **TOTAL** | **$10.3** | **88.5%** | **$9.1** | **$1.2** | **$253.9** | **87.6%** | **$222.5** | **$31.4** |

* Maximum eligibility is based on PFC guidelines for eligible terminal space and 100% funding level for PFC funds. Matching levels for regular FAA AIP grants and BIL ATP funds will be lower (90% and 95%).

# Analysis of Maximum Eligibility – Phase 2

| Project Element | Phase 2 Cost | Phase 2 Max Eligible % | Phase 2 Max Eligible Amount | Phase 2 Ineligible Amount | TOTAL TERMINAL COST Cost | TOTAL TERMINAL COST Max Eligible % | TOTAL TERMINAL COST Max Eligible Amount | TOTAL TERMINAL COST Ineligible Amount |
|---|---|---|---|---|---|---|---|---|
| Design | $3.3 | 88.5% | $2.9 | $0.4 | $21.0 | 88.0% | $18.5 | $2.5 |
| Terminal Building | 19.0 | 87.3% | 16.6 | | 109.3 | 84.7% | 92.5 | 16.8 |
| Loading Bridges | 1.8 | 100.0% | 1.8 | | 4.2 | 100.0% | 4.2 | 0.0 |
| Airfield & Apron | | 100.0% | | 0.0 | 12.3 | 100.0% | 12.3 | 0.0 |
| Enabling Projects | | 87.3% | | 0.0 | 8.7 | 88.2% | 7.7 | 1.0 |
| Roadway | | 100.0% | | | 7.3 | 100.0% | 7.3 | 0.0 |
| Utilities | 0.2 | 87.3% | 0.1 | 0.0 | 3.3 | 84.1% | 2.8 | 0.5 |
| Miscellaneous | 15.0 | 88.5% | 13.3 | 1.7 | 87.8 | 88.0% | 77.3 | 10.5 |
| **TOTAL** | **$39.2** | **88.5%** | **$34.7** | **$2.1** | **$253.9** | **87.6%** | **$222.5** | **$31.4** |

* Maximum eligibility is based on PFC guidelines for eligible terminal space and 100% funding level for PFC funds. Matching levels for regular FAA AIP grants and BIL ATP funds will be lower (90% and 95%).

# Analysis of Maximum Eligibility – Phase 3

| Project Element | Phase 3 Cost | Phase 3 Max Eligible % | Phase 3 Max Eligible Amount | Phase 3 Ineligible Amount | TOTAL TERMINAL COST Cost | TOTAL TERMINAL COST Max Eligible % | TOTAL TERMINAL COST Max Eligible Amount | TOTAL TERMINAL COST Ineligible Amount |
|---|---|---|---|---|---|---|---|---|
| Design | $2.9 | 84.6% | $2.5 | $0.5 | $21.0 | 88.0% | $18.5 | $2.5 |
| Terminal Building | 16.8 | 81.9% | 13.7 | | 109.3 | 84.7% | 92.5 | 16.8 |
| Loading Bridges | 1.2 | 100.0% | 1.2 | | 4.2 | 100.0% | 4.2 | 0.0 |
| Airfield & Apron | 0.9 | 100.0% | 0.9 | 0.0 | 12.3 | 100.0% | 12.3 | 0.0 |
| Enabling Projects | | 81.9% | | 0.0 | 8.7 | 88.2% | 7.7 | 1.0 |
| Roadway | 0.7 | 100.0% | 0.7 | | 7.3 | 100.0% | 7.3 | 0.0 |
| Utilities | 0.2 | 81.9% | 0.1 | 0.0 | 3.3 | 84.1% | 2.8 | 0.5 |
| Miscellaneous | 12.6 | 84.6% | 10.6 | 1.9 | 87.8 | 88.0% | 77.3 | 10.5 |
| **TOTAL** | **$35.2** | **84.5%** | **$29.7** | **$2.4** | **$253.9** | **87.6%** | **$222.5** | **$31.4** |

* Maximum eligibility is based on PFC guidelines for eligible terminal space and 100% funding level for PFC funds. Matching levels for regular FAA AIP grants and BIL ATP funds will be lower (90% and 95%).

# Analysis of Maximum Eligibility – Phase 4

| Project Element | Phase 4 | | | | TOTAL TERMINAL COST | | | |
|---|---|---|---|---|---|---|---|---|
| | Cost | Max Eligible % | Max Eligible Amount | Ineligible Amount | Cost | Max Eligible % | Max Eligible Amount | Ineligible Amount |
| Design | $5.8 | 83.5% | $4.8 | $0.9 | $21.0 | 88.0% | $18.5 | $2.5 |
| Terminal Building | 31.6 | 78.8% | 24.9 | | 109.3 | 84.7% | 92.5 | 16.8 |
| Loading Bridges | | 100.0% | | | 4.2 | 100.0% | 4.2 | 0.0 |
| Airfield & Apron | 1.9 | 100.0% | 1.9 | 0.0 | 12.3 | 100.0% | 12.3 | 0.0 |
| Enabling Projects | 0.2 | 78.8% | 0.2 | 0.0 | 8.7 | 88.2% | 7.7 | 1.0 |
| Roadway | 6.6 | 100.0% | 6.6 | | 7.3 | 100.0% | 7.3 | 0.0 |
| Utilities | 0.2 | 78.8% | 0.2 | 0.1 | 3.3 | 84.1% | 2.8 | 0.5 |
| Miscellaneous | 22.8 | 83.5% | 19.0 | 3.8 | 87.8 | 88.0% | 77.3 | 10.5 |
| **TOTAL** | **$69.1** | **83.4%** | **$57.6** | **$4.8** | **$253.9** | **87.6%** | **$222.5** | **$31.4** |

* Maximum eligibility is based on PFC guidelines for eligible terminal space and 100% funding level for PFC funds. Matching levels for regular FAA AIP grants and BIL ATP funds will be lower (90% and 95%).

# Analysis of Maximum Eligibility – Phase 5

| Project Element | Phase 5 | | | | TOTAL TERMINAL COST | | | |
|---|---|---|---|---|---|---|---|---|
| | Cost | Max Eligible % | Max Eligible Amount | Ineligible Amount | Cost | Max Eligible % | Max Eligible Amount | Ineligible Amount |
| Design | $8.3 | 92.2% | $7.7 | $0.6 | $21.0 | 88.0% | $18.5 | $2.5 |
| Terminal Building | 42.0 | 89.0% | 37.4 | | 109.3 | 84.7% | 92.5 | 16.8 |
| Loading Bridges | 1.2 | 100.0% | 1.2 | | 4.2 | 100.0% | 4.2 | 0.0 |
| Airfield & Apron | 7.7 | 100.0% | 7.7 | 0.0 | 12.3 | 100.0% | 12.3 | 0.0 |
| Enabling Projects | 7.6 | 89.0% | 6.8 | 0.8 | 8.7 | 88.2% | 7.7 | 1.0 |
| Roadway | | 100.0% | | | 7.3 | 100.0% | 7.3 | 0.0 |
| Utilities | 0.2 | 89.0% | 0.1 | 0.0 | 3.3 | 84.1% | 2.8 | 0.5 |
| Miscellaneous | 33.1 | 92.2% | 30.5 | 2.6 | 87.8 | 88.0% | 77.3 | 10.5 |
| TOTAL | $100.1 | 91.3% | $91.4 | $4.1 | $253.9 | 87.6% | $222.5 | $31.4 |

* Maximum eligibility is based on PFC guidelines for eligible terminal space and 100% funding level for PFC funds. Matching levels for regular FAA AIP grants and BIL ATP funds will be lower (90% and 95%).

# Identification of Eligible Projects by Funding Source

| | | | FEDERAL GRANT FUNDS | | | | | FEDERAL BIL FUNDS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AIP Entitlement Grants | AIP Discretionary Grants | Supplemental Grants | Earmarks | Small Airport Fund | Airport Infrastructure Grants | Airport Terminal Program | FAA Facilities & Equipment |
| **Max % Funding of Max Eligible Amount** | | | **90%** | **90%** | **90%** | **Unknown** | **90%** | **87.6% (100% of Max)** | **83.3% (95% of Max)** | **100%** |
| **Max Funding Avialable to CRW (2022 - 2026)** | | | **$10.0** | **$20.0** | **Unknown** | **Unknown** | **Unknown** | **$10.5** | **$211.4** | **Unknown** |
| **Project Element** | **Total Cost** | **Max Eligible Amount** | **Eligible Projects by Funding Source **** | | | | | | | |
| Design | $21.0 | $18.5 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Terminal Building | 109.3 | 92.5 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Loading Bridges | 4.2 | 4.2 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Airfield & Apron | 12.3 | 12.3 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Enabling Projects | 8.7 | 7.7 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Roadway | 7.3 | 7.3 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Utilities | 3.3 | 2.8 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| Miscellaneous | 87.8 | 77.3 | | ✔ | ✔ | ✔ | | ✔ | ✔ | |
| **TOTAL** | **$253.9** | **$222.5** | | | | | | | | |

** Checkmarks show most likely eligibility for each project based on funding source. Other projects may be eligible for certain funding sources; however, they would be considered a lower priority for funding.

# Identification of Eligible Projects by Funding Source (Continued)

| | | | FEDERAL RELIEF FUNDS | | | OTHER FUNDS | | | | | LOCAL FUNDS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CARES Act Funds | CRRSA Act Funds | ARP Act Funds | RAISE Grant Program | U.S. EDA Grants | WVDOT Grants | State of WV Discretionary | City of Charleston Discretionary | PFCs | Airport Cash | Airport Bonds |
| **Max % Funding of Max Eligible Amount** | | | 100% | 100% | 100% | 80% | 90% | 5% | Unknown | Unknown | 87.6% (100% of Max) | 100% | 100% |
| **Max Funding Avialable to CRW (2022 - 2026)** | | | $2.9 | $0.0 | $3.1 | Unknown | Unknown | Unknown | Unknown | Unknown | $0.0 | $0.0 | To Be Determined |
| **Project Element** | **Total Cost** | **Max Eligible Amount** | **Eligible Projects by Funding Source **** | | | | | | | | | | |
| Design | $21.0 | $18.5 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Terminal Building | 109.3 | 92.5 | | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Loading Bridges | 4.2 | 4.2 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Airfield & Apron | 12.3 | 12.3 | ✔ | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Enabling Projects | 8.7 | 7.7 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Roadway | 7.3 | 7.3 | | | | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Utilities | 3.3 | 2.8 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Miscellaneous | 87.8 | 77.3 | | | | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| **TOTAL** | **$253.9** | **$222.5** | | | | | | | | | | | |

** Checkmarks show most likely eligibility for each project based on funding source.  Other projects may be eligible for certain funding sources; however, they would be considered a lower priority for funding.

# Benefits

# FAA Priorities For Airport Terminal Program Grants

| PRIORITY | COMMENTS | APPLICABILITY TO CRW |
|---|---|---|
| **Improve airfield safety through terminal relocation** | • Current gates are penetration to Part 77 transitional surface<br>• Current gate locations preclude ability to retire Taxiway A MOS | ✓ |
| **Replacing aging facilities** | • Original terminal was built in 1950s; renovated/expanded in multiple phases over time<br>• Existing building is unable to efficiently accommodate future growth and technologies due to age and complicated structural grid (multiple additions over time) | ✓ |
| **Increase capacity and passenger access** | • Provides ability to accommodate larger aircraft holdroom gates<br>• Provides ability to meet 20-year demand<br>• Allows for installation of CAT equipment in security checkpoint | ✓ |
| **Encourage competition** | • Encourages competition through expanded terminal/gate capacity and ability to continue to expand as needed | ✓ |
| **Improve energy efficiency (including LEED accreditation)** | • Provides ability for sustainable design<br>• Efficient building systems and reduced electrical loads with increased daylighting | ✓ |
| **Expand access for persons with disabilities** | • Current terminal includes multiple vertical transitions that do not meet ADA standards<br>• Non-secure restaurant does not have standard ramp access for wheelchairs<br>• Eliminate security checkpoint queue area on a sloped surface<br>• New terminal facility will be built to ADA standards | ✓ |
| **Improving airport access for historically disadvantaged populations *** | • New terminal will improve access to disadvantaged populations by increasing competition and air service at the Airport<br>• WV ranks as the 2nd poorest state, with a $48,850 median household income and 4th poorest with a poverty rate of 17.6%.<br>• Charleston ranks 7th in the State with 20.9% of individuals living below the poverty line | ✓ |



* Unesco Institute for Statistics definition: A population group at risk of education exclusion as a result of sex, location, poverty, disability, ethnicity, language, migration, displacement or other characteristics

# Implementation Schedule

# Program Timeline

- **NEPA approach**
  - Working with FAA to determine NEPA approach as related to the runway project EIS
- **Taxiway A relocation and replacement concourse**
  - Justification: *Retire Taxiway A modification to standard*
  - CATEX to be submitted to FAA by June 1, 2022
  - Three-year design/construction timeframe
- **Replacement terminal**
  - Justification: *Improve passenger level of service, meet future demand and TSA requirements*
  - Includes landside improvements and passenger processing functions
  - Included in runway project EIS for environmental processing (two-year timeframe starting when FAA issues their NOI to prepare an EIS in the federal register)
  - Two-year design/construction timeframe

# General Discussion

- What are we missing? Any functions or components you'd like to incorporate?

- What design elements would you like to see in a new terminal?

- How can the terminal represent our community/region? How can it be distinctly West Virginia?

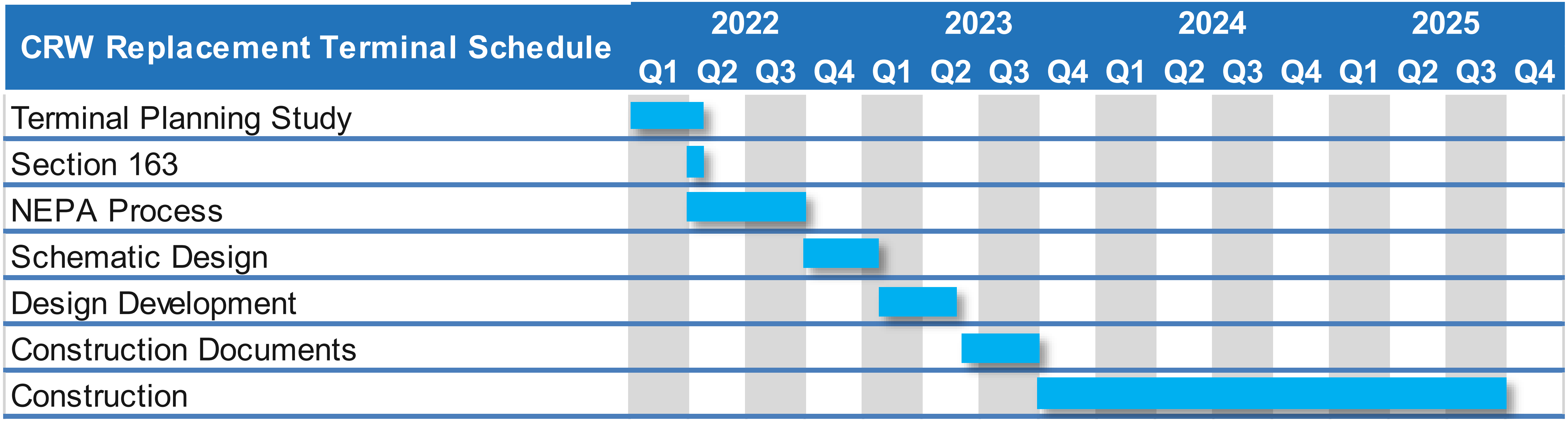
- How do we convince FAA we have a sound financial plan for the local match and ineligible portions?

# Appendix

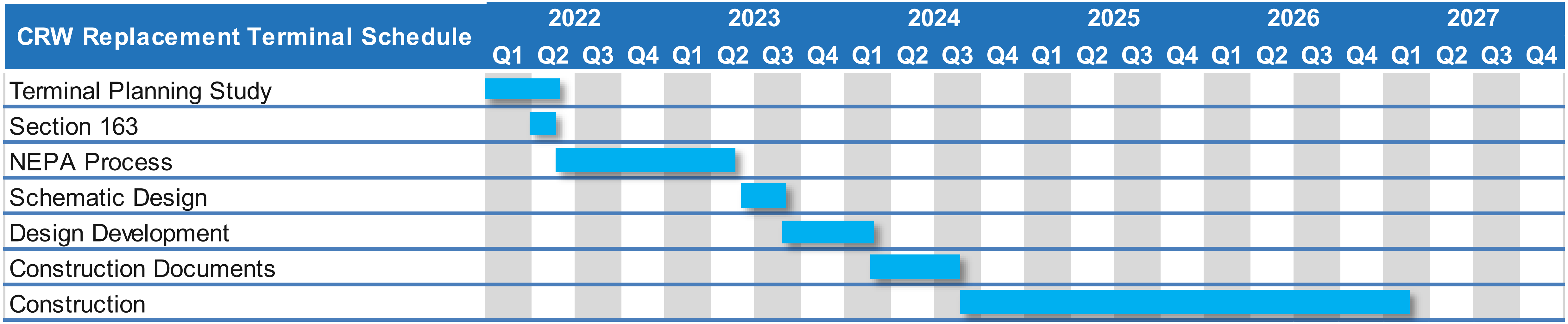
# Program Timeline

| CRW Replacement Terminal Schedule | In Months | |
|---|---|---|
| | Min | Max |
| Terminal Planning Study (from February 1) | 3 | 4 |
| Section 163 | 1 | 2 |
| NEPA Process | 6 | 12 |
| Schematic Design | 4 | 4 |
| Design Development | 4 | 6 |
| Construction Documents | 4 | 6 |
| Construction | 24 | 30 |
| **Months** | **46** | **64** |
| **Years** | **3.8** | **5.3** |

# Program Schedule – Most Optimistic



# Program Schedule – More Realistic



# Infrastructure Investment and Jobs Act – Airport Infrastructure Funding

**$25 Billion Over 5 Years**

**$15B**

## AIRPORT INFRASTRUCTURE GRANTS

For Airport projects that increase safety and expand capacity

**$5B**

## AIRPORT TERMINAL PROGRAM

To replace aging terminals and airports-owned towers, increase terminal energy efficiency and accessibility, and more.

**$5B**

## FAA FACILITIES AND EQUIPMENT

To replace facilities and equipment and improve safety, security, and environmental standards

**CRW FY 2022 Airport Infrastructure Grants**

**$2.1 million**

# Summary Aviation Infrastructure Funding

<table>
<tr><th>Funding Source</th><th>Description</th><th>Project Eligibility</th></tr>
<tr><td>Airport Infrastructure Grants</td><td>• $15 billion over 5 years<br>• $2.39B/year for primary airports<br>• $500M/year for general aviation airports<br>• $20M/year for airport-owned ATCT’s</td><td>• Allocated based on enplaned passengers<br>• Project eligibility based on PFC regulations<br>• Requires local match</td></tr>
<tr><td>Airport Terminal Program</td><td>• $5 billion over 5 years, allocated to:<table><tr><td>Large Hubs</td><td>55%</td></tr><tr><td>Medium Hubs</td><td>15%</td></tr><tr><td>Small Hubs</td><td>20%</td></tr><tr><td>Non-Hubs and Non-Primary</td><td>10%</td></tr></table></td><td>• Competitive process<br>• For terminal development, ATCTs, and on-airport rail projects<br>• 80% eligibility for Large and Medium Hubs; 95% for other airports</td></tr>
<tr><td>FAA Facilities and Equipment</td><td>• $5 billion over 5 years<br>• $200M for FAA Contract Tower Program airports</td><td>• Eligible for ATC facilities, fuel storage tank replacement, electrical systems, hazardous materials and environmental cleanup</td></tr>
<tr><td>Transportation Infrastructure Finance and Innovation Act (TIFIA)</td><td>• 15% of annual TIFIA amounts from 2021-2026 for airports<br>• Access to low-interest loans and loan guarantees</td><td>• Project eligibility based on PFC regulations<br>• Up to max of 33% eligible project costs<br>• Buy America</td></tr>
</table>

## CRW Stakeholder Workshop #1 – 4/26/22 @11:00

Attendees: Tim Brady, Jennifer Piercy, Darian David, Mara Boggs

**Question**: What drives forecast?

Answer: New air service, macro-economic process.

**Comment:** Knowing what drives air service helps staffers understand the 2nd and 3rd hand impacts of development they are supporting.

**Slide 14 Question**: What does "impact to operations mean?"

Answer: construction phasing; also, ability to meet FAA airfield standards.

**Slide 32 Question**: Did anyone else in WV apply for ATP?

Answer: Clarksburg - $20M for their terminal, Wheeling put in $1.7M; there were 500 applications nationwide.

**Comment/suggestion**: There is $5 billion in BIL to build Hydrogen hubs. There is a WV working group. Sets application apart because there is such collaboration on state level. Will get 1-2 hydrogen hubs. Suggestion: Form a gateway working group. Could send in one letter with all signatures. Could invite Sec of Trans. to a meeting. Shows collaboration, sets CRW apart.

**Suggestion**: Write letter for delegations to jointly sign. Follow up with phone calls.

**General Discussion**

- Likes two level. Incorporate glass, visibility of mountains.
- Local organizations can be connective tissue.
- Tourism includes business travel, flight school.
- Mayor has good relationship with Sec of Transportation. She could be of assistance.
- Requested amenities – bar, Wi-Fi, charging stations, comfortable seating, baby area,
- Set aside money for annual air show.

## CRW Stakeholder Workshop #2 – 4/26/22 @1:30

Attendees: Chandler Swope, Jaden Hardesty, Emily Hatfield, Chelsea Ruby

**Question**: Can you stop after each phase if costs increase or funding falls through?

Answer: Airport will have to do Phase 2 once do Phase 1. But other phases can be stand-alone.

**Question**: Is inflation factored in?

Answer: Yes. Made estimates for inflation in each year. Increases more in the short-term.

**Question**: Design costs is tabulated for each phase. Does it all have to be expended all at once?

Answer: No. Design is scaled over time. Used different pot of money – entitlements to do design and soft costs initially.

**Question**: Is matching around 15%?

Answer: Yes, because there are ineligible portions of the project.

**Question**: Does having $40 million upfront committed help?

Answer: Yes – makes it more attractive to FAA.

**Comment**: Runway extension is around $700 million. Need to package runway and terminal when asking for state funds. Total ask is $86 million. Invest money, not spend it.

**Comment**: National Park can drive airport travel. Promote it. Need revenue guarantee to increase air service.

**Comment**: Need to align tourism data with airport data to determine leading markets and emerging markets. Example – not advertising Florida now but could. Could explore custom partnerships, advertising, setting up program.

**Comments on design**:

- Building “almost heaven” brand has been successful. Leading to growth in tourism, even in COVID. Visitation rate in WV in 2021 was all time high. Would like to be involved as possible in design to showcase WV.
- Earth tones, natural elements, bringing outside in. Love being able to step outside. Bring the mountains and hills inside. Live plant walls, greenery, woodwork. Rafting.
- Have beautiful photography assess for wall wraps. Extend trademarks into design. Exposed beams, steel, wood, earth. Reclaimed wood.
- Branded color palette. 18 different colors from actual WV photography.
- Stary night skies. Interact with space, multi-media space, speak to WV.
- Vending with multiple screens. Consider modern technology.
- Lean into the national park heavily.

**Question**: Are we gaining concessions.

Answer: We are doubling the space. Mostly on secure side to maximize revenues. Showing flexible space, kiosk-type.

**Comments**: For retail: Carry West Virginia Market Place into shops so have standard t-shirts, etc. Put local beers, wine, foods into the restaurants.

**Further comments on design**:

- New Parkways facility is similar to our renderings.
- Need space for traveler information. One would be a central hub area airside. Good place to explore new technology.
- Can use input on construction partitions – good for messaging.

**Question**: What is timing of runway?

Answer: Will be under construction when terminal finished.

## CRW Stakeholder Workshop #3 – 4/26/22 @3:00

Attendees: Trip Shumate, Allen Tackett, Charlie Reynolds, Trent Barnhart, Dana Farrell, Andrew Gunnoe, Lance Wheeler, Katrina Bowers,

**Question**: Is there a point in time that we can't move forward due to TSA requirements?

Answer: TSA does have a pax threshold at which you have to comply with new equipment. There would be implications to other spaces.

**Question**: What are vertical circulations?

Answer: Escalators and elevators

**Question**: Can existing terminal location be used for expansion in future?

Answer: No, it will be part of the airside.

**Question**: Is terminal envisioned to have glass fronts?

Answer: Glass helps maximize sense of West Virginia and provides access to the views of the mountains.

**Comment**: Keep walking distances to a minimum.

**Question**: $40.2 is based on what? Can county or state ARP funds be used for this?

Answer: Matching and non-eligible portions. Unknown if ARP can be used. Should be able to use these funds.

Question: For the various sources of funds – what rate is this for local funds?

Answer: All are a little different. Ranges from 5-10% 95% is of eligible portion, not total costs. Comes out to around 83%-84% qualifying for federal.

**Question**: Is ARC a source of funds? Lower share – 50/50. They can't match federal funds.

Answer: It is a possibility.

**Question**: Is it only FAA who determines who gets the funds?

Answer: It is all FAA.

**Question**: Will there be a public rollout?

Answer: If get grant money – will do big press release.

**Question**: What should state delegates say to their constituents to demonstrate why this is needed?

Answer: There has been a regionalization of air service, so CRW becomes more important. Regionalization is due to pilot shortages, airline mergers. Competition is people driving to hubs. Longer runway and bigger gates allow more non-stop service. Allows CRW to attract new air service.

**Question**: Have you had conversations with development office? What is their feedback?

Answer: All positive feedback from them, very supportive.

**Comment**: Challenge is commitment for match. Need to demonstrate that we have that match – guaranteed.

**Comment:** Created air service working group with Charleston Area Alliance. Revenue guarantees are important to getting new air service.

**Question**: How far does the taxiway need to be moved.

Answer: 133’

**Question**: Is runway part of this project?

Answer: It is a separate project, but all projects must be shown on the ALP.

**Question**: What is timing of runway?

Answer: Design for new runway would start in 3 years.

**Question**: What is advantage of extending runway?

Answer: It is a function of destination. Longer runway allows for further away destinations. Need to do it now.

**Comment**: Consider time and money for entirely new airport compared to sunk investment here and paying back grant assurances. Investment we’re talking about here pales in comparison to those costs.

**Question**: 60-acre pad - is this on same elevation as runway?

Answer: Yes, it would be accessible by aircraft.

**Comments**:

- Now is the best time to move forward because the money is available. This is an investment for the entire state.
- Have a responsibly to maximize return on investment.
- State does not have a 10-year vision plan. Need to know best place to make their investment. Make sure it fits into overall master plan for the state.
- Need to make sure we don’t miss out on opportunities with airports.
- County asked - would delegates consider allocating money specifically for WV airports?
- Tax on aviation fuel – has to be used on airports. Led to 5% match. It is tough for airports to provide matching funds.
- NC funds $85 million/year for airports.

## CRW Stakeholder Workshop #4 – 4/27/22 @10:00

Attendees: Dr. Lew Whaley, Steve Roberts, Mayor Amy Goodwin, Nicole Christian, Susie Salsberry, Joe Reidy, Eric Nelson, Mitch Carmichael, Senator Eric Tarr, Doug Skaff

**Question**: The ticketing process has changed so much. How will this area change?

Answer: Square space allows for flexibility. Will have more bag-drop locations, instead of ticketing counters. Becomes contact-less as possible.

**Comment**: Back in 1960s, Charlotte, NC was same size as Charleston, WV. Piedmont chose Charlotte. This is CRW's opportunity to make the right decision.

**Question**: How will it be phased?

Answer: Would keep ticketing, checkpoint, etc in existing building when build new concourse.

**Question**: $5 billion in ATP applications. What was the dollar amount of total applications?

Answer: It is $1 billion per year. We don't know how much in dollar amount or how many small airports.

**Question**: What comes first – runway or terminal.

Answer: Terminal will be finished first, but construction will be concurrent.

**Comment**: Restrooms – make them family friendly for men and women; more space for women's vs men's restrooms.

**Comment**: Showcase capital city, state of WV. Open aired space speaks to it. Have small hospitality hubs for brochures/QR codes. Advertise local eateries, shops.

**Comment**: Airport is first expression, front door for WV. Public art, best landscaping, upscale. Put the wow factor in. First step in rebuilding West Virginia. Modern – tabletops with interactive screens, video boards, make it so you don't know if you're inside vs outside because of all the images; embrace water, don't forget we're in the capital city.

**Comment**: Have meeting space here at the airport so don't have to go downtown.

Answer: AEDC accommodates this. New board room can also accommodate this.

**Comment**: As come down to bag claim and as you're exiting, make sure that we do have easy pick up – ride share, taxi, local service, hotel shuttles. Have good wayfinding, clearly marked. Make sure wayfinding to rental car is clearly marked and easy to find.

**Question**: On the funding matches, is there a match required for each piece.

Answer: Yes, percent match differs based on funding source. Averages out to around 87%. Ability to get federal funds, is dependent on getting matching funds up front.

**Question**: Can money be set aside at state level for future year?

Answer: Yes, state legislature can do this.

**Question**: Is the $254 just the terminal?

Answer: It is only the terminal. Doesn't include other projects like the runway.

**Comment**: Revenue guarantees will help add air service, new destinations, higher frequency.

**Question**: How many applications were from WV.

Answer: Three.

**Question**: How important is a partnership with airlines and big business?

Answer: Very important. Airlines aren’t going to focus on CRW. But business support is important. Airlines will watch what businesses are doing. Runway extension to 8,000 feet will help allow new air service.

## CRW Terminal Workshop
## Guest List

| Date | Guest | Organization | Attendance |
|---|---|---|---|
| **4/26/22 @ 11:00** | Tim Brady | Charleston CVB | ✓ |
| | Jennifer Piercy | Senator Capito's office | ✓ |
| | Darian David | Congresswoman Miller's office | ✓ |
| | Mara Boggs | Senator Joe Manchin's Office | ✓ |
| | | | |
| **@ 1:30** | Chelsea Ruby<br>Jayden Hardesty<br>Emily Hatfield | Secretary of Tourism<br>WV Dept. of Tourism<br>WV Dept. of Tourism | ✓<br>✓<br>✓ |
| | Senator Chandler Swope | | ✓ |
| | | | |
| **@3:00** | Commissioner Lance Wheeler | Kanawha County Commission | ✓ |
| | Trip Shumate | CWVRAA Board | ✓ |
| | Allen Tackett | CWVRAA Board | ✓ |
| | Delegate Dana Ferrell | WV House of Delegates | ✓ |
| | Andrew Gunnoe | Kanawha County Commission | ✓ |
| | Delegate Charlie Reynolds | WV House of Delegates | ✓ |
| | Delegate Trenton Barnhart | WV House of Delegates | ✓ |
| **4/27/22 @ 10:00** | Mayor Amy Goodwin | Mayor of Charleston | ✓ |
| | Nicole Christian | Charleston Area Alliance | ✓ |
| | Susie Salisbury | Charleston Area Alliance | ✓ |
| | Senator Eric Nelson | WV Senate | ✓ |
| | Mitch Carmichael | Secretary of Economic Development | ✓ |
| | Senator Eric Tarr | WV Senate | ✓ |
| | Lew Whaley | CWVRAA Board | ✓ |
| | Joe Reidy | 3 Point Strategies | ✓ |
| | Steve Roberts | WV Chamber of Commerce | ✓ |
| | Delegate Doug Skaff | WV House of Delegates | ✓ |

# Appendix E – Acronyms

| | | |
|---|---|---|
| AAM | – | Advanced Air Mobility |
| ACIP | – | Airport Capital Improvement Plan |
| ACRP | – | Airport Cooperative Research Program |
| ADA | – | Americans with Disabilities Act |
| AGIS | – | Airports Geographic Information System |
| AGL | – | Above Ground Level |
| AIG | – | Airport Infrastructure Grant |
| AIP | – | Airport Improvement Program |
| ALCMS | – | Airfield Lighting Control and Monitoring System |
| ALP | – | Airport Layout Plan |
| ARPA | – | American Rescue Plan Act |
| ATC | – | Air Traffic Control |
| ATCT | – | Airport Traffic Control Tower |
| ATP | – | Airport Terminal Program |
| BIL | – | Bilateral Infrastructure Law |
| CABC | – | Coarse Aggregate Base Course |
| CARES | – | Coronavirus Aid, Relief, and Economic Security |
| CAT | – | Credential Authentication Technology |
| CCP | – | Cement Concrete Pavement |
| CRRSAA | – | Coronavirus Response and Relief Supplemental Appropriation Act |
| CRW | – | West Virginia International Yeager Airport |
| CT | – | Computed Tomography |
| DDFS | – | Design Day Flight Schedule |
| EDA | – | Economic Development Administration |
| EDS | – | Electronic Data Systems |
| eVTOL | – | electric Vertical Takeoff and Landing |

| | | |
|---|---|---|
| F&E | – | Facilities & Equipment |
| FAA | – | Federal Aviation Administration |
| FIS | – | Federal Inspection Services |
| GARBS | – | General Airport Revenue Bonds |
| HMA | – | Hot Mix Asphalt |
| IATA | – | International Air Transport Association |
| L&B | – | Landrum & Brown |
| LEED | – | Leadership in Energy and Environmental Design |
| LOI | – | Letter of Intent |
| LOS | – | Level of Service |
| MAG | – | Minimum Annual Guarantees |
| MAP | – | Military Airports Program |
| MSL | – | Mean Sea Level |
| OFA | – | Object Free Area |
| Part 77 | – | Federal Regulation Title 4 Part 77 |
| PBB | – | Passenger Boarding Bridges |
| PFC | – | Passenger Facility Charges |
| PMAWD | – | Peak Month Average Week Day |
| RAISE | – | Rebuilding American Infrastructure with Sustainability and Equity |
| RSA | – | Runway Safety Area |
| TAF | – | Terminal Area Forecast |
| TRACON | – | Terminal Radar Approach Control |
| TSA | – | Transportation Security Administration |
| ULCC | – | Ultra Low Cost Carrier |
| WVDOT | – | West Virginia Department of Transportation |