



Blue Grass Airport

LEXINGTON, KENTUCKY

Terminal Area Plan

December 2025

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Section One

Introduction

The Lexington Blue Grass Airport Terminal Area Plan (TAP) represents a forward-thinking blueprint for the airport’s evolution over the next two decades. Developed as a detailed extension of the airport’s Master Plan, the TAP is both a response to the region’s growing air travel demand and a proactive strategy to ensure that LEX remains a modern, efficient, and welcoming gateway for Central Kentucky.

1.1 Terminal Area Plan Summary

At the heart of this plan is a clear recognition: passenger volumes at LEX are expected to rise dramatically, with annual enplanements projected to nearly double by 2045. This anticipated growth is not just a matter of accommodating more travelers—it is a call to reimagine every aspect of the airport experience, from curb to gate, and from parking to baggage claim.

To meet this challenge, the TAP recommends a phased, flexible approach to terminal redevelopment. Rather than a single, disruptive overhaul, the plan outlines a series of manageable construction phases that allow the airport to expand capacity and modernize facilities while maintaining uninterrupted operations. Two leading terminal concepts—each designed to support up to 1.5 million annual enplanements—are advanced for further consideration, both emphasizing adaptability and operational resilience.

A central recommendation of the TAP is the creation of flexible, right-sized spaces throughout the terminal. Ticketing, security, baggage handling, concessions, and restrooms are all programmed to industry best practices, ensuring that the airport can deliver a high level of service even during peak periods. The plan calls for expanding the number of gates from 10 to 13, modernizing security screening and baggage systems, and increasing concessions and passenger amenities—especially in the post-security areas where travelers spend the most time. **Table 1.1-1, Demand Outlook and Program Summary**, presents a high-level summary of both the refined Demand Outlook and Terminal Space Program.

Table 1.1-1 – Demand Outlook and Program Summary

	Base Year (2025)	PAL 1 (2030)	PAL 2 (2035)	PAL 3 (2040)	PAL 4 (2045)
Demand Outlook					
Annual Enplanements	831,521	1,065,796	1,197,687	1,336,661	1,490,258
Peak Hour Arriving Passengers	463	599	639	639	639
Peak Hour Departing Passengers	456	572	615	615	615
Terminal Space Program					
Required Gates	10	11	11	12	13
Ticketing – Agent Counters	15	17	17	18	18
Ticketing – Self Service Devices	4	5	5	4	4
Passenger Security Screening Checkpoints	3	4	4	4	4
Baggage Claim Devices	2	4	4	4	4
Checked Baggage Screening Devices	2	2	2	2	3
Total Gross Area (SF)	236,670	278,450	282,860	294,590	313,420

Source: CMT, Alliance

A defining feature of the TAP is its methodical exploration of conceptual alternatives for the future terminal. Eleven distinct terminal concepts were developed and are more fully described in Section Four, each offering a different approach to layout, expansion capability, operational efficiency, and passenger experience. These alternatives ranged from parallel concourses to innovative single-loaded and hybrid configurations.

Each concept was evaluated against a set of rigorous criteria, including air traffic control tower (ATCT) line of sight, phasing and constructability, long-term expansion potential, operational considerations, customer experience during and after construction, sustainability, and budget impact. Through a collaborative process involving airport leadership and technical experts, the field was narrowed to the most promising options.

Ultimately, two concepts emerged as the preferred paths forward:

- Concept 4 (“L” Configuration): This design features a single-loaded concourse angled to optimize ATCT visibility and minimize operational disruption during construction. It allows for phased expansion, improved apron space, and efficient passenger flows. Concept 4 is presented in **Exhibit 1.1-1, Concept 4**.
- Hybrid Concept: Blending the strengths of the “L” configuration with elements of the traditional headhouse layout, the Hybrid Concept offers additional flexibility for future growth and operational resilience. The Hybrid Concept is presented in **Exhibit 1.1-2, Hybrid Concept**.

Both concepts are intended to be implemented in phases, allowing the airport to respond to changing demand and funding availability while minimizing impacts on ongoing operations. The TAP recommends advancing these two concepts for further refinement and stakeholder engagement, ensuring that the final design will be both visionary and practical.

The TAP also addresses the landside experience, recognizing that a traveler’s journey begins well before they reach the terminal doors. The plan recommends expanding the terminal curbside, and a new Ground Transportation Center (GTC) to keep pace with demand. These landside recommendations will lead to streamline commercial vehicle operations, reduce congestion, and improve wayfinding and safety for all airport users.

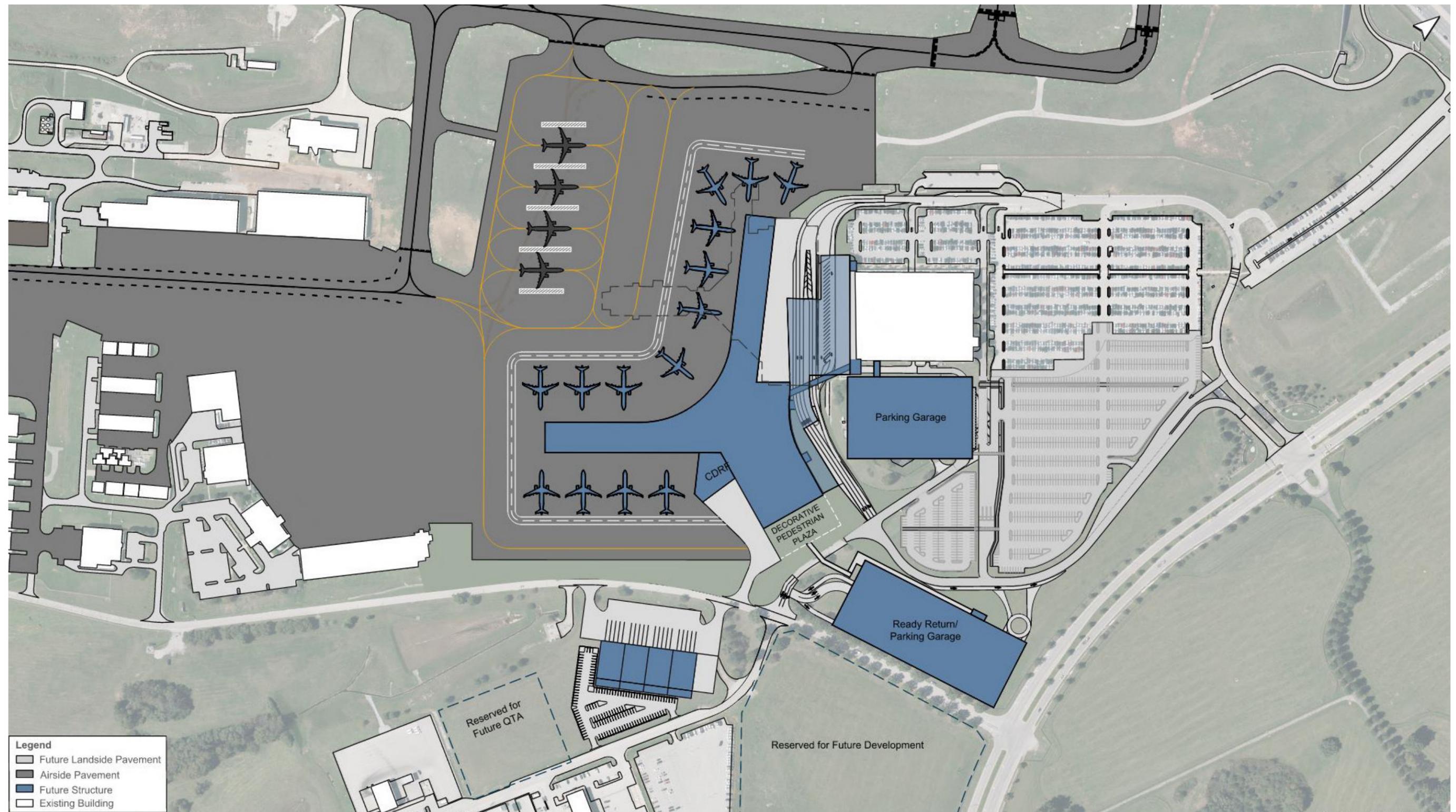
Underlying these physical improvements is a commitment to operational efficiency and sustainability. The TAP calls for the consolidation and modernization of utility corridors, upgrades to stormwater and glycol management systems, and the creation of a centralized receiving and distribution facility to support secure and efficient airport logistics.

The TAP is more than a construction roadmap—it is a comprehensive strategy for growth, resilience, and passenger satisfaction. By embracing phased development, flexible design, and strategic investment, LEX is poised to meet the needs of tomorrow’s travelers while continuing to serve as a vital economic engine for the region.

The TAP was initiated during the final stages of the airport’s Master Plan Update, reflecting a proactive approach to addressing evolving passenger needs and operational requirements within the terminal complex. As the Master Plan neared completion, it became evident that a more granular and focused examination of the passenger terminal was necessary to ensure seamless alignment between projected demand and facility capabilities. The TAP was established to bridge this gap, serving as a critical next step in refining the recommendations put forth in the Master Plan, with particular emphasis on the functional and spatial requirements of the terminal area.

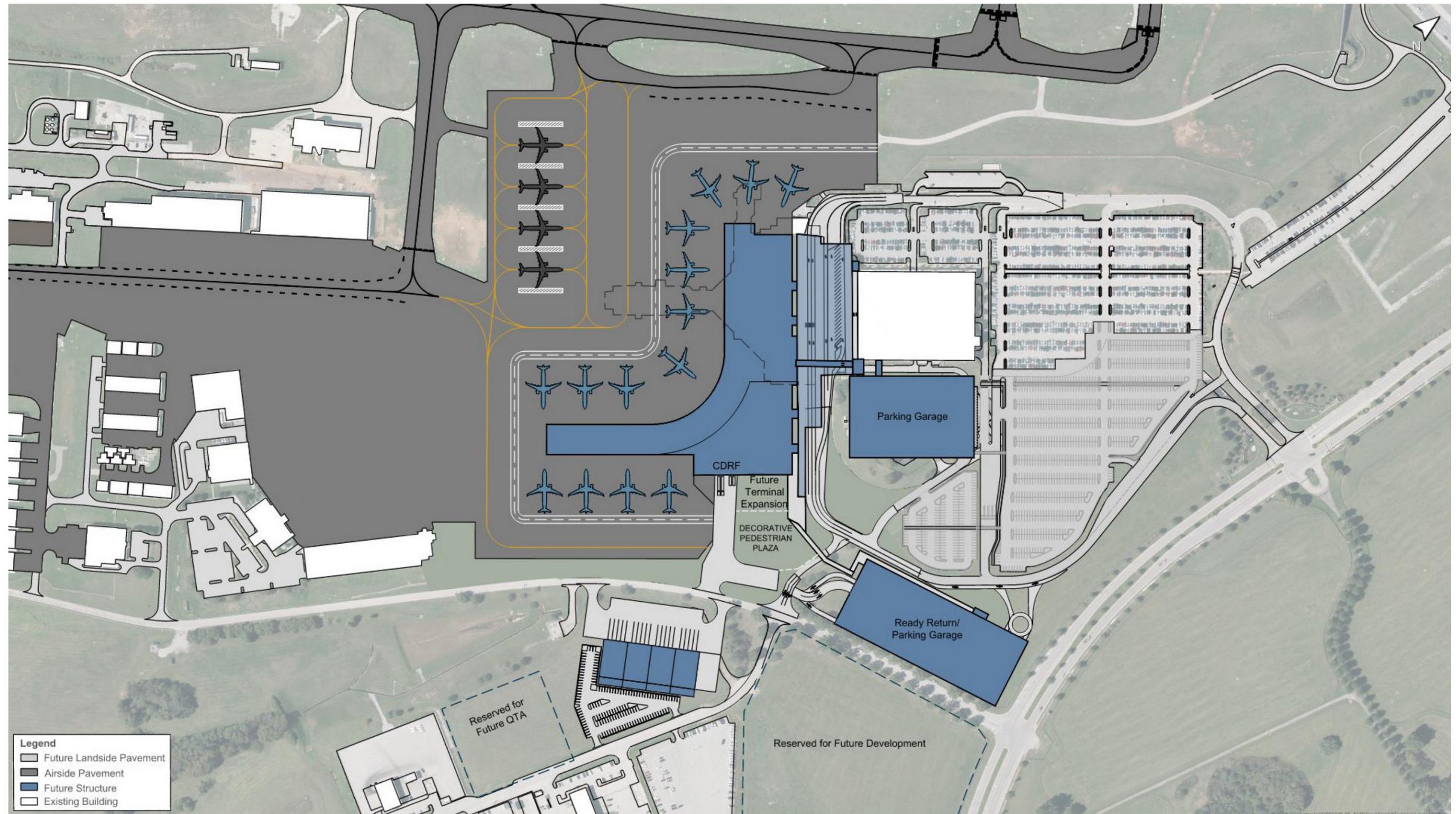
The inception of the TAP was driven by the need to translate the Master Plan’s strategic vision into actionable steps for terminal development. This initiative was not intended to replace or modify the foundational projections and assumptions of the Master Plan; rather, its purpose was to build upon those findings by developing a detailed space program and conceptual plans that would optimize terminal operations and passenger experience in the future. The TAP sought to provide the airport and its stakeholders with a comprehensive framework for decision-making, ensuring that future investments would be both targeted and sustainable. **Exhibit 1.1-3, Hybrid Concept Rendering**, presents a three-dimensional rendering of the Hybrid Concept.

Exhibit 1.1-1 – Concept 4



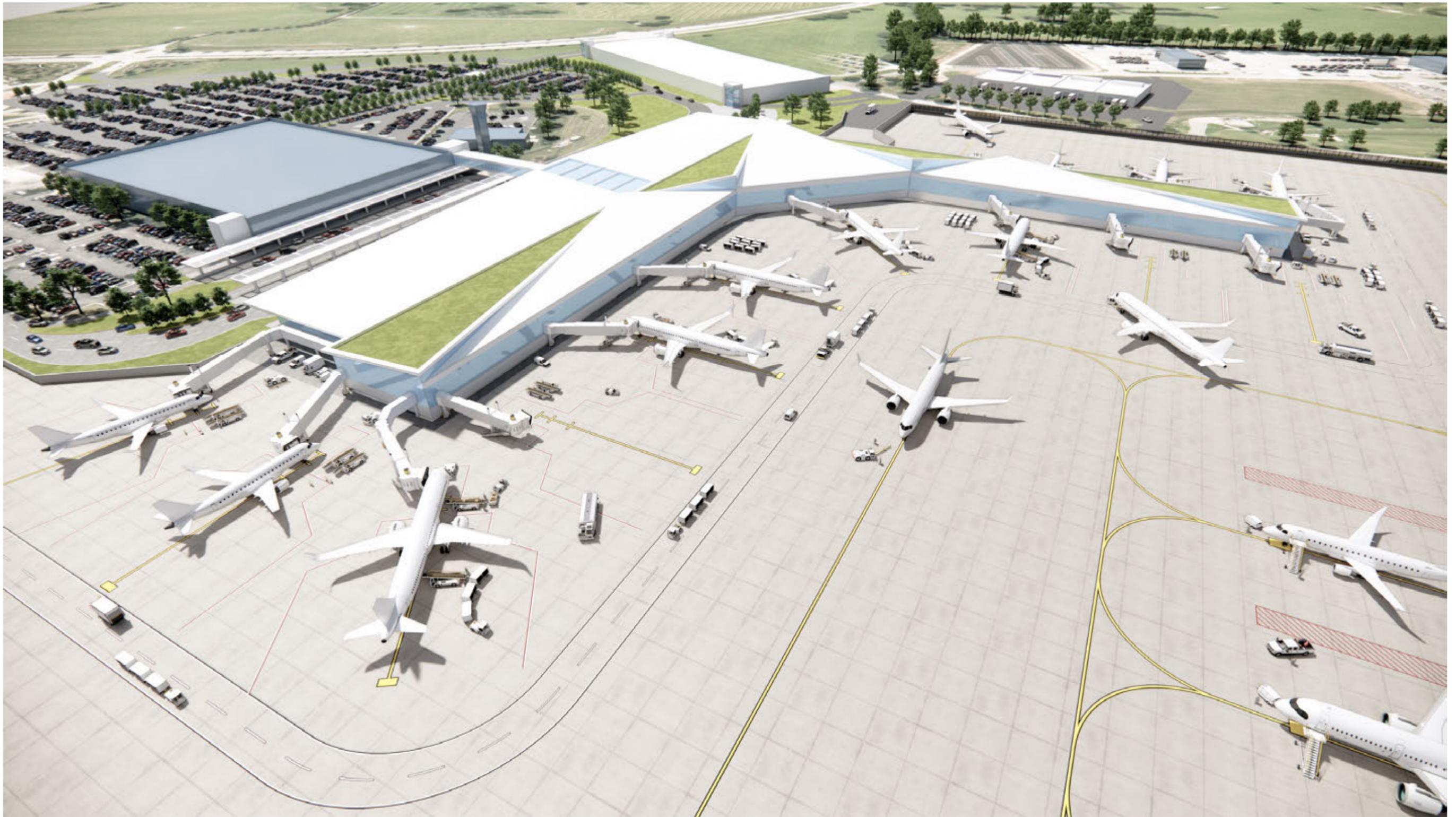
Source: CMT, Alliance, WSP

Exhibit 1.1-2 – Hybrid Concept



Source: CMT, Alliance, WSP

Exhibit 1.1-3 – Hybrid Concept Rendering



Source: CMT, Alliance, WSP

Section Two

Demand Outlook

One of the primary components of the TAP is to develop a refined program of functional terminal needs and requirements of facilities needed within the terminal complex. To do so, the Forecast of Aviation Demand that was developed as part of the Master Plan needed to be advanced to a higher level of fidelity than what is traditionally completed in a master planning effort. To that end, the TAP undertook the effort to develop Design Day Flight Schedules (DDFS) based upon the projections and assumptions made in the Master Plan Forecast. This effort did not include any updates to the Master Plan Forecast but used those projections as a basis for understanding how growth is likely to occur. All DDFS produced as part of this study are consistent with overall annual projections of passengers and commercial operations presented in the Master Plan.

2.1 Annual Enplanement Projections

The first step in developing the DDFS for use in terminal planning is to understand and identify the annual projections of passenger enplanements developed by the Master Plan. These projections of enplanements will serve as targets of the DDFS when extrapolated out to an annual basis. The Master Plan’s recommended forecast of aviation activity projected growth of enplanements during a period of time beginning in 2021 and ending in 2041. During that 20-year period, enplanements were projected to grow at a compound annual growth rate (CAGR) of 5.5 percent. With a base year of 2021, the Master Plan developed projections for the milestone years of 2026, 2031, 2036, and 2041. Given the timing of the TAP and beginning work in late 2024, a base year for the TAP was determined to be 2025, with milestone years, or Planning Activity Levels (PALs) of 2030, 2035, 2040, and 2045. **Table 2.1-1, Master Plan Enplanement Forecast Summary**, presents the projections of annual enplanements developed by the Master Plan as well as the interpolated enplanement projections utilized by the TAP.

Table 2.1-1 – Master Plan Enplanement Forecast Summary

Year	Master Plan Enplanements	TAP Enplanements	CAGR
2021	464,169	434,169	-
2025	-	831,521	15.7%
2026	961,994	961,994	15.7%
2030	-	1,065,796	5.1%
2031	1,093,451	1,093,451	2.6%
2035	-	1,197,687	2.4%
2036	1,225,263	1,225,263	2.3%
2040	-	1,336,661	2.2%
2041	1,366,059	1,366,059	2.2%
2045	-	1,490,258	2.2%

Notes: The Master Plan document only provided projections at milestone years of 2026, 2031, 2036, and 2041.
 Source: LEX Master Plan Study, CHA (2024)

2.2 Peak Month Average Day Baseline

To develop the DDFS it was necessary to determine the appropriate day to utilize as the base flight schedule. At the time of analysis, the most recent published schedules for 2024 were analyzed to determine which day most accurately represents a historically average day of capacity in a peak month of capacity to determine the Peak Month Average Day (PMAD). Based on 2024 schedules, this date was determined to be June 14, 2024, which was a Friday. However, because there had been some capacity growth since that date, and most airlines had published schedules far in advance, the base schedule utilized became June 13, 2025, another Friday. At the time schedules were being analyzed, however, Allegiant had not yet published their schedule that far in advance. Therefore, the June 13, 2025, schedule was modified to reflect Allegiant's schedule based on June 14, 2024.

The determination of July 13 as the PMAD differs from the PMAD identified in the Master Plan Forecast of the average day in July. This analysis was based on passenger data in 2021 which was still experiencing the recovery from the COVID-19 pandemic. As part of the TAP effort, a more holistic review of Peak Months was undertaken over a longer period. With the exception of COVID and a brief period in October 2023, June has historically been the peak month of the year for commercial passenger traffic at LEX. In addition, the published schedules for June 2025 continue this trend, therefore the TAP DDFS utilize the PMAD of June 13, 2025, as a baseline.

To create schedules for the PALs for analysis (2025, 2030, 2035, 2040, and 2045), the June 13, 2025, schedule for LEX was downloaded utilizing the Station Activity Report available via Airline Data Hub which is provided by Airline Data, Inc. This base schedule was modified as described above, to include Allegiant's 2024 June 13th schedule – specifically flights to/from St. Petersburg/Clearwater International Airport (PIE), Sanford-Orlando International Airport (SFB), and Punta Gorda Airport (PGD) that were operated in the previous year.

2.3 Future Design Day Flight Schedules

While the Master Plan enplanement forecast is valuable in measuring projected passenger activity, it does not directly quantify the level of capacity needed at the airport to achieve those enplanement results. Therefore, CMT analyzed the relationship between seat capacity and enplanements at LEX from 2004 through 2023. A regression analysis was performed to generate a predictive formula to project the needed change in seats to generate a given change in enplanements. This formula was found to be a good predictor of seats with a strong correlation value of .81. The formula could then be applied to the Master Plan Forecast to estimate the needed number of annual seats in growth from the previous year to generate the projected number of annual enplanements.

Once the number of additional seats that needed to be accounted for was calculated, the next challenge became determining what airlines, aircraft, and times of day flights would be operated to fulfill that number of seats. The Master Plan Forecast chapter presented a section which identified potential routes that may be a part of the growth and projected the timing of each route to be added. Therefore, each of these opportunities that were found to be relevant to future growth (some opportunities have already been achieved) were captured and assigned operators and aircraft based upon industry knowledge of airlines, their networks, and fleet plans, and in consultation with the airport staff who have ongoing air service development conversations with the airlines.

However, the growth in capacity generated by those opportunities alone was not enough to fulfill the capacity growth inherent in the Master Plan Forecast. Therefore, knowledge of airline strategies and fleet plans was used to identify potential opportunities for additional capacity at LEX. This includes items such as the gradual elimination of 50-seat regional jets in favor of 70 or 76-seat regional jets and items like the impending retirement of the Boeing 717 from the fleet.

Once all growth opportunities had been identified, the next step was to implement this capacity in schedule form. The 2030 schedule was created first, from the base forecast in 2025 as a starting point. The growth in 2030 consisted of new Ultra Low-Cost Carrier (ULCC) service to Orlando International Airport (MCO), the restoration of New York City service that LEX had operated previously, and the up-gauging of regional jets from 50-seat aircraft to 76-seat aircraft. The time of day for each of the new growth markets was determined by examining proxy markets that are of similar size and geography to LEX. In the case of 2030, Breeze service between Springfield Abraham Lincoln Capital Airport (SPI) and MCO was utilized as proxy for service between LEX and MCO. The exact schedules of the previous LEX-NYC service were utilized. Once the 2030 schedule was developed, it was used as the base for 2035, and that process was repeated until schedules had been completed through 2045. **Table 2.3-1, DDFS Air Service Growth**, presents a summary of the additional air service/routes that were assumed to be added to each DDFS to achieve the annual enplanement targets established by the Master Plan Forecast.

Table 2.3-1 – DDFS Air Service Growth

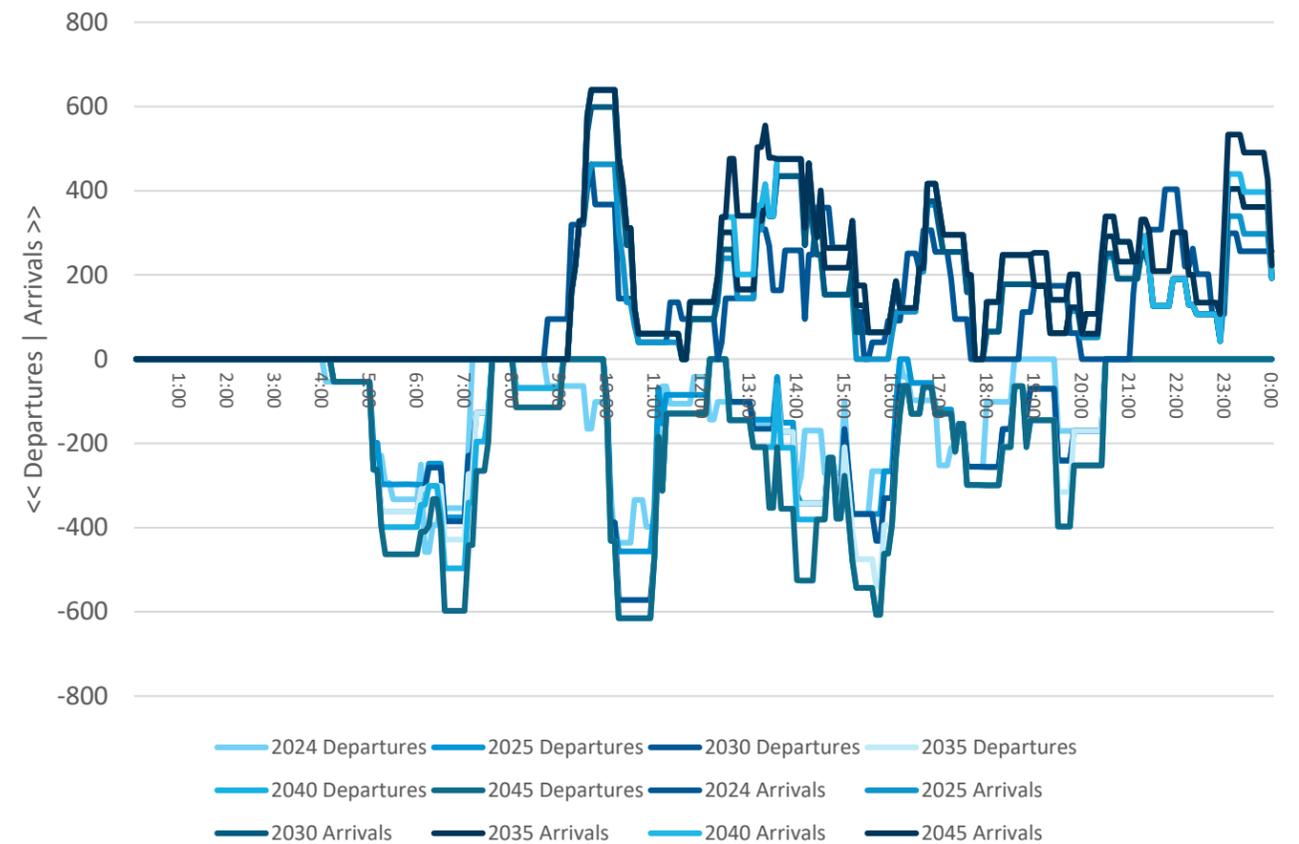
DDFS	Air Service Additions/Up-Gauge (beyond previous schedule)
2025	<ul style="list-style-type: none"> Additional Service <ul style="list-style-type: none"> Allegiant A320 – Orlando-Sanford International Airport (SFB) Allegiant A320 – Punta Gorda Airport (PGD) Allegiant A320 – St. Pete-Clearwater International Airport (PIE)
2030	<ul style="list-style-type: none"> New Service <ul style="list-style-type: none"> Breeze A220 – Orlando International Airport (MCO) Delta CRJ9 – New York LaGuardia Airport (LGA) United E170 – Newark Liberty International Airport (EWR) Up-Gauge <ul style="list-style-type: none"> American – Chicago O’Hare International Airport (ORD) to E170 United – Chicago O’Hare International Airport (ORD) to E170
2035	<ul style="list-style-type: none"> New Service <ul style="list-style-type: none"> United – Houston George Bush Intercontinental Airport (IAH) Up-Gauge <ul style="list-style-type: none"> Delta – Atlanta Hartsfield/Jackson International Airport (ATL) to A320
2040	<ul style="list-style-type: none"> Additional Service <ul style="list-style-type: none"> American CRJ9 – Philadelphia International Airport (PHL) Up-Gauge <ul style="list-style-type: none"> American – Dallas/Ft. Worth International Airport (DFW) to B738
2045	<ul style="list-style-type: none"> New Service <ul style="list-style-type: none"> Allegiant A319 – Las Vegas Harry Reid International Airport (LAS) American E175 – Miami International Airport (MIA) Up-Gauge <ul style="list-style-type: none"> Delta – Detroit International Airport (DTW) to A220 United – Chicago O’Hare International Airport (ORD) to A319 United – Denver International Airport (DEN) to A319

Source: CMT

2.4 Peak Hour Passengers

Upon completion of the DDFS for each of the PALs, calculations were applied to the DDFS to determine the profile of passenger demand throughout the design day. These profiles are expressed in terms of rolling 60-minute arriving and departing passengers, or the number of passengers departing or arriving at any point in time throughout the day over the following 60 minutes. The resulting profile allowed the team to determine the peak number of arriving passengers and departing passengers in any given 60-minute period throughout the day. **Exhibit 2.4-1, Rolling 60-minute Passenger Profiles**, presents the daily profile of each DDFS developed for use in the TAP.

Exhibit 2.4-1 – Rolling 60-minute Passenger Profiles



Source: CMT

While the Master Plan Forecast was utilized as the baseline for overall annual passenger growth targets for the development of the DDFS, a comparison of the TAP DDFS peak hour passengers and the Master Plan Forecast’s projections of peak hour passengers indicates a difference peak hour passenger demand. This difference is experienced in both arriving and departing peak hour passengers and indicates that while the peak hours do grow over the planning period, not all growth is occurring in the peak hours of the schedule but during less busy times of the day as well. **Table 2.4-1, Peak Hour Passenger Comparison**, presents a comparison of the peak hour arriving and departing passengers in both the Master Plan Forecast and the TAP DDFS. While the difference between the two data sets is significant, it is not unexpected as the Master Plan applied a consistent ratio of peak hour passengers to average day, peak month and annual passengers which is common practice in a Master Plan Forecasting effort.

Table 2.4-1 – Peak Hour Passenger Comparison

DDFS Year	Peak Hr. Arriving	Peak Hr. Departing	MP Forecast Year	Peak Hr. Arriving	Peak Hr. Departing
2025	463	456	2026	805	661
2030	599	572	2031	915	751
2035	639	615	2036	1,025	842
2040	639	615	2041	1,143	939
2045	639	615	-	-	-

Source: CMT, CHA



2.5 Gate Demand Projections

At full capacity, the Airport currently operates from ten contact gates, or gate holdrooms with a dedicated passenger boarding bridge (PBB) supporting a total of 14 aircraft parking positions. Several of these gates are configured to accommodate two aircraft parking positions utilizing a single PBB capable of swinging between both aircraft positions. These additional positions are primarily used for Remain Overnight (RON) aircraft. RON aircraft are flights that arrive late in the evening and depart early the following morning.

Utilizing the DDFS presented in Section 2.3, projections of gate demand were developed. Gate assignments for each airline operating at LEX were based on the scheduled demand and were typically designated as Preferential Use by airline. In contrast, Common Use gates allow the Airport to allocate flights to any available gate, thereby enhancing gate utilization and reducing the overall number of gates required. While Common Use was factored into future gate planning, each airline was given priority to a gate or group of gates throughout the day to optimize ground handling efficiency. During off-peak periods, these gates would remain available for use by other carriers when not occupied by the primary airline.

To ensure operational flexibility, all gates were assumed to be configured to accommodate narrowbody aircraft while maintaining an industry planning standard of 20-foot wingtip clearances. This includes aircraft such as the Airbus A321 for length and the Boeing 737 MAX 8/9/10 for wingspan. Gate demand was plotted by assigning a gate for each flight throughout the day. A 25-minute “inter-gate” buffer time has been incorporated into each scheduled flight to ensure gate availability. This buffer reserves the gate 10 minutes prior to the scheduled arrival and 15 minutes following the scheduled departure, accommodating early arrivals and departure delays. **Exhibit 2.5-1 through Exhibit 2.5-6, Projected Gate Demand by Design Day**, depicts each of the planning years plotted gate charts. **Table 2.5-1, Projected Gate Demand Summary**, summarizes gate demand by passenger activity level and projected year. While existing aircraft departure operations per gate remain consistent, increased annual enplanements per gate is consistent with the projected up-gauging of aircraft throughout the forecast period.

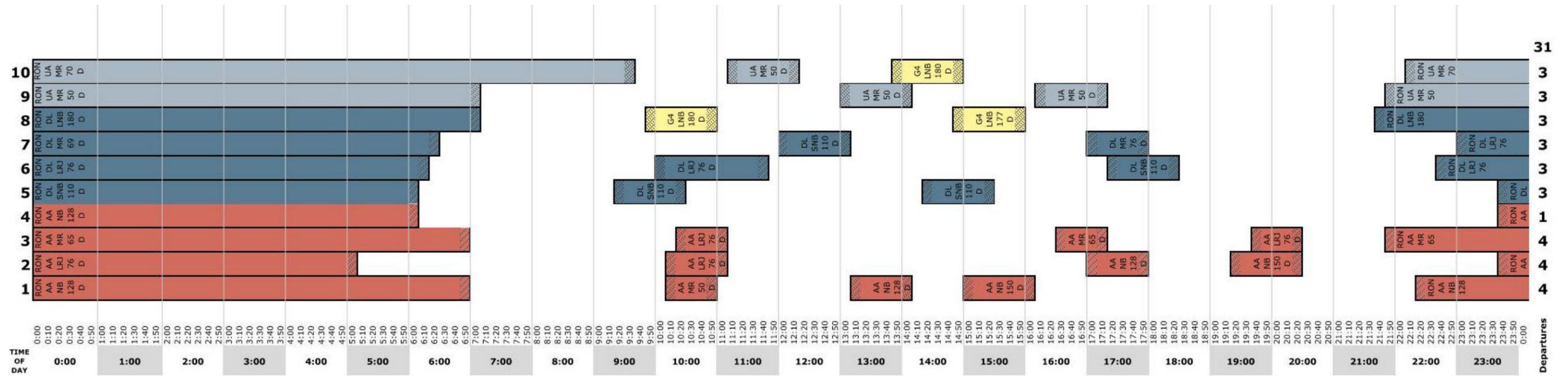
Table 2.5-1 – Projected Gate Demand Summary

	Base Year (2025)	PAL 1 (2030)	PAL 2 (2035)	PAL 3 (2040)	PAL 4 (2045)
Annual Enplanements	861,521 ¹	1,065,796	1,197,687	1,336,661	1,490,258
PMAD ² Departure Operations	33	36	37	39	41
Airplane Design Group (ADG)					
II – Medium Regional (CRJ)	1	-	-	-	-
III – Large Regional (CR9/E75)	-	-	-	-	-
III – Small Narrowbody (717/220)	2	-	-	-	-
III – Narrowbody (319/320/739/7M8)	7	11	11	12	13
Total Contact Gates	10	11	11	12	13
Total RON	10	11	11	12	13
Departures per Gate	3.3	3.3	3.4	3.3	3.2
Annual Enplanements per Gate ³	86,150	96,890	108,880	111,390	114,640

Notes: 1. Extrapolated from 2024 Master Plan Forecast
 2. PMAD = Peak Month Average Day
 3. Values Rounded

Source: Alliance, CMT

Exhibit 2.5-1 – Projected Gate Demand – 2024 Design Day

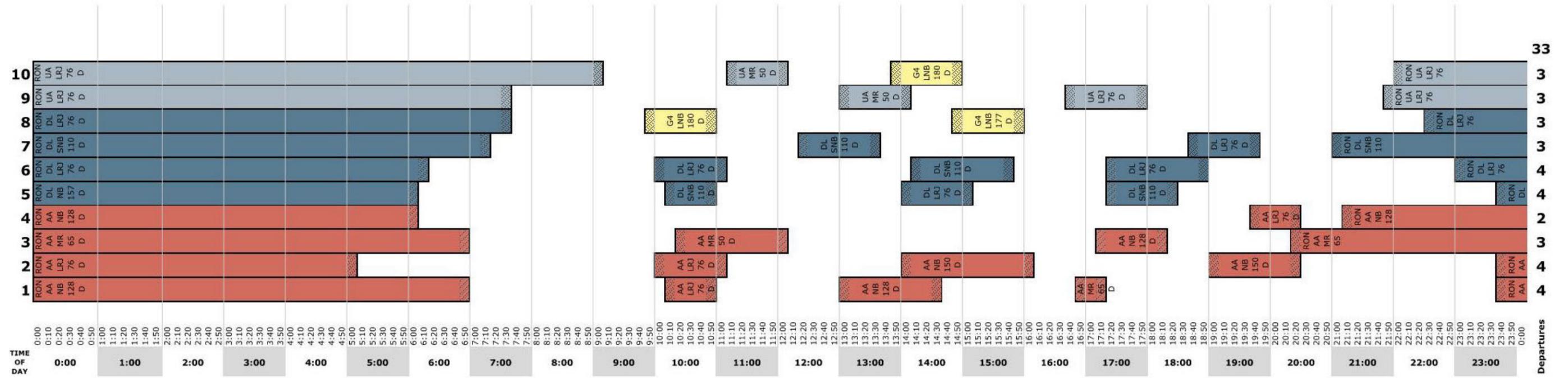


June 2024 Design Day
Gate Schedule

Color Key: Allegiant (G4), American (AA), Breeze (MX), Delta (DL), United (UA)

Source: Alliance, CMT

Exhibit 2.5-2 – Projected Gate Demand – 2025 Design Day

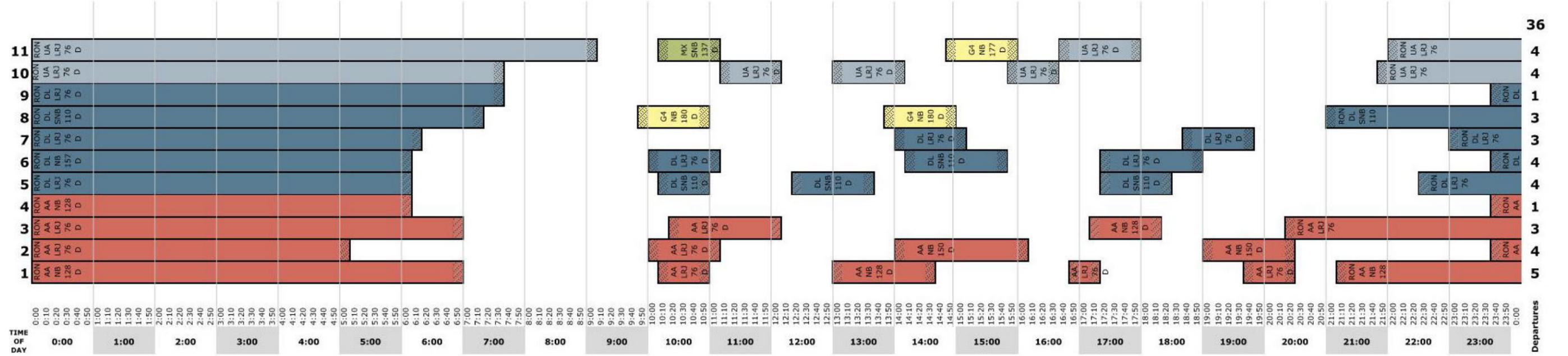


June 2025 Design Day
Gate Schedule

Color Key: Allegiant (G4), American (AA), Breeze (MX), Delta (DL), United (UA)

Source: Alliance, CMT

Exhibit 2.5-3 – Projected Gate Demand - 2030 Design Day

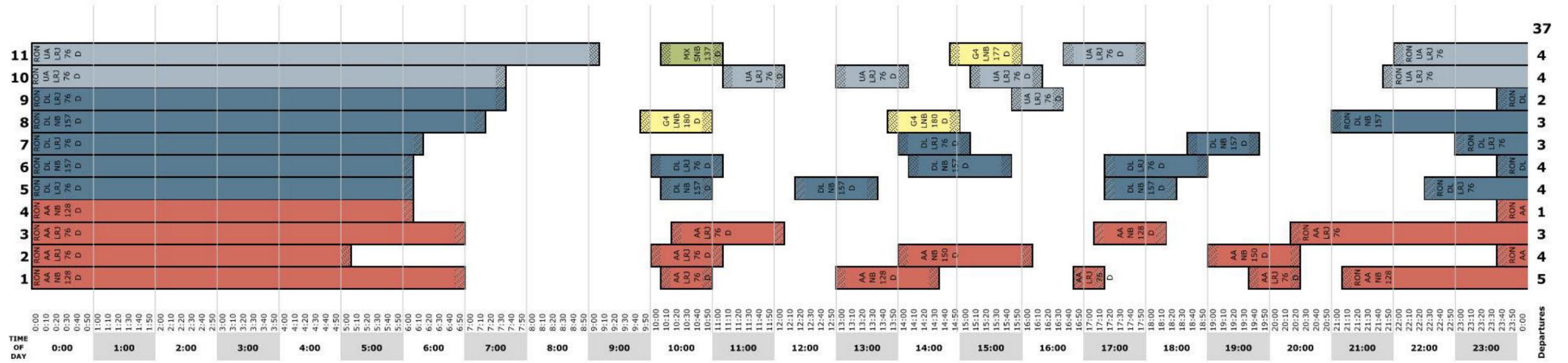


June 2030 Design Day
Gate Schedule

Color Key: Allegiant (G4) American (AA) Breeze (MX) Delta (DL) United (UA)

Source: Alliance, CMT

Exhibit 2.5-4 – Projected Gate Demand - 2035 Design Day

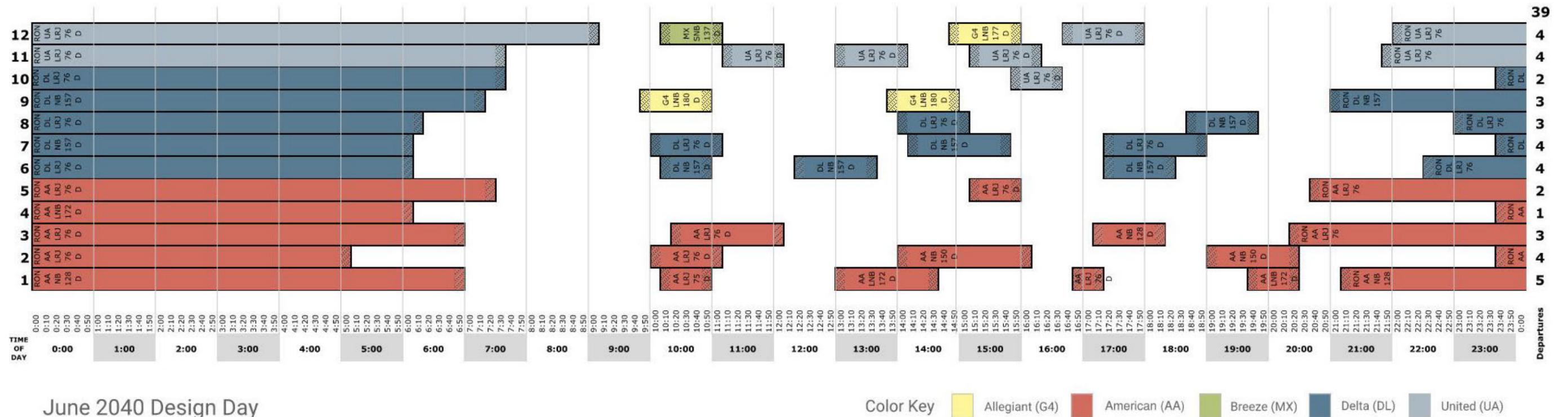


June 2035 Design Day
Gate Schedule

Color Key: Allegiant (G4), American (AA), Breeze (MX), Delta (DL), United (UA)

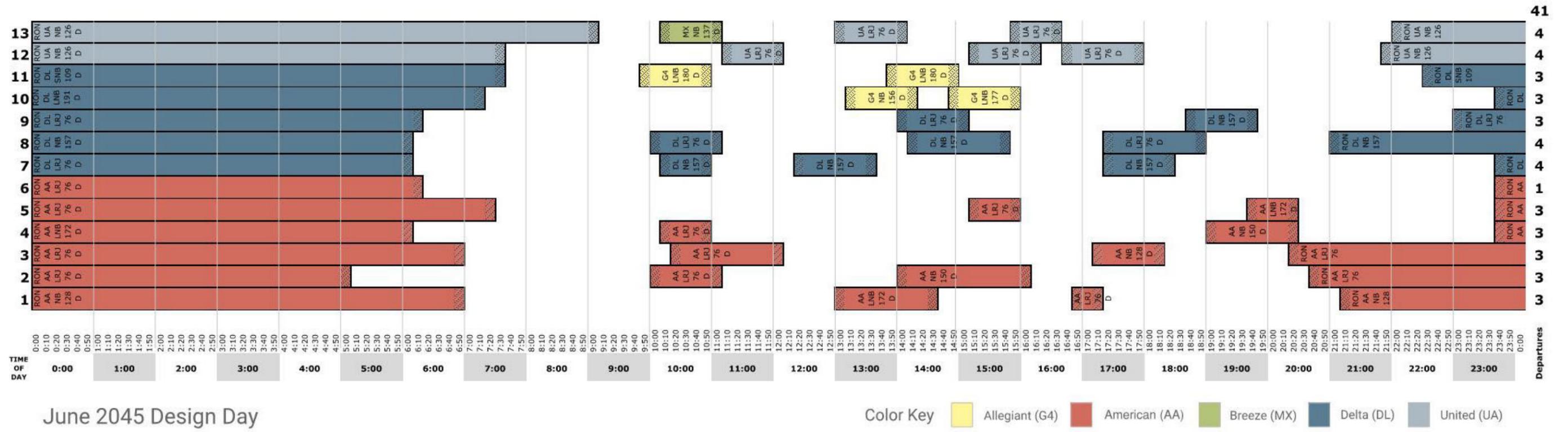
Source: Alliance, CMT

Exhibit 2.5-5 – Projected Gate Demand - 2040 Design Day



Source: Alliance, CMT

Exhibit 2.5-6 – Projected Gate Demand - 2045 Design Day



Section Three

Programming

The terminal space and processor programming framework establishes the foundational methodology for determining facility requirements in an airport passenger terminal. This approach integrates a range of industry-recognized planning standards—including those from the Airport Cooperative Research Board (ACRP), the Federal Aviation Administration (FAA), the Transportation Security Administration (TSA), United States Customs and Border Patrol (CBP), and the International Air Transport Association (IATA) to ensure a comprehensive and future-ready terminal plan. By applying these guidelines alongside current terminal utilization data and projected passenger activity levels, planners can effectively size and configure terminal functions such as ticketing, security screening, baggage handling, gate holdrooms, and public amenities. The program is anchored in the concept of IATA’s “Optimum” Level of Service (LoS), which prioritizes stable passenger flow and comfort, and is calibrated to support long-term growth through the planning period.

3.1 Terminal Space & Processor Programming

3.1.1 Methodology and Assumptions

The overall terminal facility requirements were developed through the application of ACRP Report 25, *Airport Passenger Terminal Planning and Design*; FAA Advisory Circular (AC) 150/5360-13A, *Airport Terminal Planning*; the TSA *Checkpoint Requirements and Planning Guide (CRPG)*; the TSA *Planning Guidelines and Design Standards (PGDS) for Checked Baggage Inspection Systems Version 8.0*; US Customs and Border Protection *Airport Technical Design Standard (ATDS) 2021*; ACRP Report 226, *Planning and Design of Airport Terminal Restrooms and Ancillary Spaces*; and the IATA *Airport Development Reference Manual (ADRM) 12th Edition*. Additionally, communication with the Airport staff and knowledge of industry trends were also utilized.

IATA’s LoS standards are typically utilized by airport planners to qualitatively or quantitatively provide a LoS standard at various processing functions within the terminal building. An “Optimum” LoS was used when programming the functional passenger spaces and is often referred to as LoS “C” and defined by IATA as providing “Good LoS; condition of stable flow; acceptable brief delays; and a good level of comfort.” Current area utilization ratios were determined using the existing terminal plans provided by the Airport and the June 2025 summer DDFS which establishes a baseline condition of demand compared to current facility capacities.

Airport terminal facilities are typically programmed using demand associated with annual and peak-hour passenger and operation projections. Although annual activity indicates overall airport size, peak hour volumes more accurately reflect demand for specific passenger processing functions within the terminal facility. These peak hours are typically calculated from the peak month’s average day (PMAD) and are called Design Hour passengers. PAL 4, or approximately 1.49 million annual enplanements, represents the demand level to which all conceptual alternatives were developed with expansion for additional capacity for future growth. A summary of the PALs and peak hour activity is presented in **Table 3.1-1, Programming Forecast Summary**.

Table 3.1-1 – Programming Forecast Summary

	Base Year (2025)	PAL 1 (2030)	PAL 2 (2035)	PAL 3 (2040)	PAL 4 (2045)
Annual Enplanements	831,521	1,065,796	1,197,687	1,336,661	1,490,258
Peak Month Enplanements	98,119	125,764	141,327	157,726	175,850
% of Annual Enplanements	11.8%	11.8%	11.8%	11.8%	11.8%
Peak Month Average Day (PMAD) Enplanements	2,806	3,135	3,490	3,784	4,139
Peak Hour Passengers					
Enplaned	456	572	615	615	615
Deplaned	463	599	639	639	639
Total ¹	851	1,011	1,095	1,095	1,095
Peak Hour % of Daily Activity					
Enplaned	16.3%	18.2%	17.6%	16.3%	15.0%
Deplaned	17.1%	19.7%	19.0%	17.7%	16.2%
Total	30.3%	32.2%	31.4%	28.9%	26.5%

Notes: 1. Total peak hour passengers are not cumulative as each may occur in separate hours of the day.
Source: 2024 LEX Master Plan, CMT, Alliance

Typically, terminal programming utilizes two types of peak hour passenger levels: individual airline and Common Use. Individual airline passenger levels refer to the peak activity for each carrier that occurs over 60 minutes based on that airline's flight schedule. As a result, these individual airline peaks may occur at different times of the day and, therefore, do not typically coincide in the same clock hour. The assumption is that this peak demand is appropriate when determining the facility requirements for individual airlines that allocate specific functional space within the terminal. Depending on the operating use agreement with the Airport, these areas include individual airline ticket counters, gates/holdrooms, and sometimes baggage claim facilities.

Common use peak passenger levels refer to the cumulative peak passenger volume in a given "rolling" 60 minutes for all airlines at the Airport. These common-use peak demand levels are typically used for calculating non-airline specific functions such as passenger security screening, baggage screening, and public areas, including general seating and meeter/greeter lobbies. For the conceptual planning study the Common Use Peak hour was utilized for all passenger processing functions of the terminal.

Other functional area projections are typically determined by their relationship to the number and type of aircraft or the number of gates/seats serving the terminal area. The relationship of area projections per aircraft operations, or by gates/seats, is also a typical way to compare airport building component requirements. These terminal areas can include airline operations space, inbound/outbound baggage operations, and secure public restrooms.

3.1.2 Passenger Processing and Baggage Functions

The following sections present the passenger processing functions of the terminal including ticketing, passenger security screening, gate holdrooms, baggage claim, and restrooms and the respective programming requirements.

Ticketing and Check-In

The passenger check-in function is a factor of the Common Use peak hour check-in demand, the associated passenger early arrival profiles, acceptable service times associated with the check-in process, and passenger check-in profiles. This also includes IATA's Optimum passenger wait times by processor type, and acceptable LoS square feet factors which were utilized to program future demand.

Currently, there are four airlines operating at LEX consisting of American (AA), Allegiant (G4), Delta (DL), and United (UA). Surveys were also sent to each airline which provided typical baggage and passenger profile requests. Additionally, a low-cost carrier was added for future capacity programming purposes. Future ticketing requirements included the use of industry accepted planning standards, the results of the airline surveys combined with data provided by the Master Plan, as well as the following:

- Applied TSA early arrival passenger profiles to the DDFS to determine actual peak demand at the check-in counters
- 81 percent to 85 percent Load Factors
- 100 percent origin & destination (O&D) passengers with 50 percent checking bags
- Decreasing use of agent and self-service devices (SSD) with increase of mobile check-in use over the 20-year planning period
- Standard agent and SDD passenger processing rates
- A max queue wait time of 10-minutes for agent and 1-2 minutes for SSD (IATA LoS "Optimum")
- Agent positions based on 12-foot counter or 6 linear feet per agent (includes 30-inch bag scale)
- Counter depth of 10 feet (from face of counter to back wall)
- 23-foot queue depth which includes an 8 foot "active check-in zone" depth in front of the counters for passenger processing and cross-circulation
- Average 750 square feet per Airline ticket office (ATO)

A total of 18 agent positions spanning 120 linear feet, along with four SSD positions, will be required to support the full 20-year program. The check-in area, encompassing approximately 4,100 square feet, accommodates both passenger queuing and ticket counter agent functions.

TSA Passenger Security Screening Checkpoint (SSCP)

Demand calculations for security screening were based on the common use peak 30 minutes of the departing peak hour since all airlines will utilize a single consolidated checkpoint for passenger screening. As previously stated, future planning requirements are based on the TSA CRPG published in September 2022.

Currently, three lanes provide screening for both PreCheck and standard passengers within the existing terminal. Demand calculations were based on applying TSA early arrival profiles to the Common Use peak departure hour along with the following planning guidelines:

- A peak 30-minute demand of approximately 41 percent of the peak hour was calculated from the design day flight schedules and utilized for future planning years
- Average throughput of 150 and 200 passengers per lane per hour for standard and PreCheck passengers respectively
- A ratio of 60 percent standard and 40 percent PreCheck passengers
- An additional 15 percent of the peak demand was added for employee and crew screening through the checkpoint.
- To calculate lane requirements an industry-acceptable maximum waiting time of ten minutes in the queue was assumed.
- A TSA queue recommendation of 600 square feet per lane was utilized which equates to an IATA "Optimum" LoS of 12 square feet per passenger.
- An area of 1,600 square feet per lane with one required Private Screening Room (PSR) at 120 square feet.
- An exit corridor width of 10 feet.

Utilizing the planning assumptions outlined, a total of four lanes are required for the full 20-year program equating to a total area of approximately 10,750 square feet. The area also provides space for the latest TSA Checkpoint Property Screening System (CPSS) equipment which includes Computed Tomography (CT) x-ray devices with a separate re-composure zone for passenger baggage reconciliation. Exit lane breach control devices are increasingly being implemented at airports due to their automation capabilities and the advantage of operating without the need for direct human supervision. Provisions for the area required for these devices are accounted for in the planning. Additionally, flexible or "soft" program areas, those that can be easily repurposed in the future, should be located adjacent to the screening area to allow for potential expansion as demand grows. In contrast, spaces that are difficult to reconfigure, such as those containing plumbing or large mechanical systems, should be located elsewhere.

Passenger Gate Holdrooms

Gate holdrooms are based on the required mix of aircraft gates and the average seating capacity of each airplane design group. These areas generally consist of the passenger seating area, the airline's podium, associated queue space, the passenger boarding bridge egress corridor, standing and circulation areas, and additional square footage allowances for areas such as soft-seating or charging stations. For LEX, following the Common Use gate model, holdrooms would be designed to accommodate large narrowbody aircraft, ensuring greater flexibility in gate assignments. Additional factors and assumptions include the following:

- 186-seat large narrowbody aircraft
- An 84 percent load factor
- An IATA "Optimum" (LoS C) with 70 percent of the passengers seated at 22 square feet per passenger and the other 30 percent standing at 15 square feet per passenger
- A gate holdroom depth of 35 feet allows the area to provide soft seating zones and a deeper queue area at the gate podiums
- Whenever possible, gate holdrooms are suggested to be configured in "shared" or "paired" layouts to take advantage of the adjacent gate holdroom seating area. However, this is only achievable when no near-simultaneous departures occur at the adjoining holdroom, which depends on airline scheduling patterns. This analysis utilized a 10 percent reduction factor in the seating and standing area for gates in a "paired" layout.

Utilizing these criteria, a single gate holdroom requires a total area of approximately 3,600 square feet. For gates configured in a “paired” layout, the total area decreases to approximately 3,300 square feet. This would equate to a total gate holdroom space of approximately 41,660 square feet required for the full 20-year program. A breakdown of the gate sizing methodology based on IATA’s “Optimum” LoS range is presented in **Table 3.1-2, IATA Gate Holdroom Planning Methodology**.

Table 3.1-2 – IATA Gate Holdroom Planning Methodology

Category	IATA Optimum LoS (High)	IATA Optimum LoS (Mid)	IATA Optimum LoS (Low)	Recommended
Aircraft Seats	186			186
Load Factor	84%			84%
Design Passengers	156			156
Seated %	70%	60%	50%	70%
Seat #	109	94	78	109
Area/Passenger – Seat (SF)	24	22	19	22
Seat Area (SF)	2,590	2,020	1,520	2,360
Standing %	30%	40%	50%	30%
Standing #	47	62	78	47
Area/Passenger – Standing (SF)	16	15	13	15
Standing Area (SF)	750	910	1,010	680
Total Seat/Standing Area (SF)	3,340	2,930	2,530	3,040
Gate Depth (FT)	35			35
Gate Podium/Egress (SF)	560			560
Total Area (SF)	3,900	3,490	3,090	3,600
Total Area – Paired Gates (SF)	3,570	3,200	2,830	3,290

Source: IATA, Alliance

Baggage Handling System Planning

The following program areas which include TSA Checked Baggage Screening, Outbound Baggage Make-up, Inbound Baggage Laydown and Public Domestic Baggage Claim Hall were all developed by JSM & Associates with assumptions and results documented in the “Checked Baggage Inspection System Baggage Demand Analysis Report” presented in Appendix A.

TSA Checked Baggage Screening

Future checked bag screening factors and assumptions include the following:

- LEX future DDFS for each planning activity level by year.
- TSA latest early arrival passenger profiles from the PGDS v8.
- EDS baggage screening based on future L-3 eXaminer 3DX 6700 ES machines with rates of 654 bags per hour.
- Domestic checked bags per passenger ratio of approximately 0.7 per the PGDS v8 with an Oversize bag of 4 percent and Out-of-Gauge bags of 2 percent.
- Calculations were based on the TSA’s formula for projecting peak 10-minute bag demand and subsequent number of EDS machines derived from the DDFS.
- Area requirements based on a ratio of approximately 3,800 square feet per EDS unit.

Results from the JSM analysis indicate the need for two devices for the full 20-year program with expansion space for a future third device encompassing a total area of approximately 11,430 square feet. This area includes space for the Checked Baggage Inspection System (CBIS)/Checked Baggage Resolution Area (CBRA), expansion space, TSA support offices and IT.

Outbound Baggage Make-up

Future baggage make-up includes the area used for the accumulation, storage, and make-up of outbound baggage from the ticket counter and inline EDS baggage screening area. This space typically consists of the make-up units, baggage train circulation and maneuvering lanes, and the tug/cart staging areas. Depending on the operational needs, additional space may be added which includes lanes for tug traffic, curb areas and walkways for ground handlers, and additional circulation which ties other areas of the make-up area together. The JSM analysis indicates the existing 300 linear foot makeup carousel will support the full 20-year program need providing frontage for up to 24 staged carts with a total area of approximately 15,000 square feet.

Inbound Baggage Claim Laydown

The inbound bag room represents the area used to deliver bags to the baggage claim devices. In the existing condition, once bags are offloaded, they circulate through the wall and into the public area for claim on two flat plate “T” shaped claim devices. Future baggage claim requirements are based on slope plate carousel devices, each providing a single laydown belt long enough to support a tug and three carts. The future design day flight schedules were utilized to calculate peak active flights. Based on the scheduled flights a need for four laydown belts would be required with expansion space for a future fifth belt. Total area requirements include a 50-foot laydown belt with a one-way cart off-load aisle and bypass lane equates to approximately 4,800 square feet.

Public Domestic Baggage Claim Hall

The Baggage Claim Hall represents the area occupied by the baggage claim devices and the retrieval area for active claiming of baggage by passengers. Baggage claim requirements are primarily based on the percentage of deplaned terminating passengers in a peak period within the peak hour, the percentage of those passengers checking bags, travel party size, and to a lesser extent the number of bags checked. The JSM analysis indicates a total of five peak active flights calculated from the 2045 DDFS. This would require a total of five slope plate carousel devices. However, two of the flights are smaller regional aircraft which could share a single device bringing the requirement to four with expansion for a future fifth device as previously stated.

Additional factors and assumptions include:

- Assumed current common use claim device assignment.
- Load Factors derived from DDFS, 100 percent terminating passengers.
- 31 square feet per linear feet of slope plate claim (includes device, 15-foot retrieval depth, and circulation within the positive claim area).
- 155 linear feet slope plate device.

Based on the number of devices calculated from the DDFS and the assumptions presented, the total 20-year claim area requirement is approximately 19,100 square feet while preserving space adjacent to the claim area for a future 4,800 square feet of expansion area for the fifth device with additional area for circulation.

Public Concessions and Rental Car Offices

The concessions areas are devoted to commercial spaces that generate revenue for the Airport including food/beverage, news/gift/sundry, rental car, and other revenue generating functions.

There are two general high level planning rules to approximate overall concessions areas; one suggesting approximately eight to 12 percent of the public serving space be allocated to concessions, another utilizing a ratio of square feet of total revenue generating concessions space per 1,000 annual enplanements. These areas typically include any space which the public has unrestricted access to. Of this area it is recommended that, depending on airport activity, 80–90 percent of the total concessions area be allocated to the post security or airside portion the terminal. The remaining 10–20 percent is allocated to the non-secure or landside portion of the terminal. Due to the financial importance of the concession program, it is suggested that the Airport seeks a concession planning specialist prior to determining the final concession mix and airside/landside split.

Additional factors and assumptions include the following:

- 10 square feet per 1,000 enplaned passenger (8–10 square feet high level planning factor).
- 90 percent airside, 10 percent landside.
- 20 percent additional for support spaces.
- Rental Car areas based on existing 400 square feet/Office (six offices) and 10-foot-deep queue.

For the 20-year planning horizon, landside concessions, including rental car offices, require approximately 5,400 square feet. Airside provides approximately 16,100 square feet for a total combined area of 21,500 square feet.

Public Restrooms

The program for public restrooms has been divided between the landside (pre-security) and airside (post-security) portions of the terminal. The rationale for calculating the number of restroom locations, fixtures, and associated areas by landside and airside followed that found in the ACRP Report 226, "Planning and Design of Airport Terminal Restrooms and Ancillary Spaces." It is recommended that restroom locations provide, at a minimum, as many fixtures for women as are offered to men.

Modern square feet per fixture ratios are higher to account for increased circulation space within the restroom areas, grooming space, ledges for personal items, larger stalls with outswing doors to allow for carry-on baggage, and wider chase space for easier maintenance accessibility. For this analysis, the following assumptions and guidelines were utilized for the landside (pre-security) portions of the terminal:

- 50 percent men with 33 percent female increase factor.
- Peak departure hour volume and their well-wishers (0.2 well-wisher per passenger).
- Peak arrival hour volume and their meeters/greeters (0.3 meeters/greeters per passenger).
- Approximately 118 average square feet/fixture plus 150 square feet for each family restroom.

For the airside (post-security) concourse locations, fixture counts are primarily based on the mix of arrival aircraft served by the concourse and the resulting surge activity. To capture these periods, the peak 20-minute passenger percentage of the arrival peak hour is a typical metric utilized. For concourse programming, the following assumptions were utilized:

- 66 percent average peak 20-minute percent of peak hour.
- 60 percent restroom utilization.
- 50 percent men with 33 percent female increase factor.
- Approximately 118 average square feet/fixture plus 150 square feet for each family restroom, 264 square feet for Nursing Mother's Room, and 144 square feet for a Service Animal Relief Area (SARA).

U.S. Customs & Border Protection (CBP) Federal Inspection Services (FIS) – International Arrival Facility

FIS areas are required by law for the processing of international passengers into the U.S. except for pre-cleared flights from most Canadian airports and other airports with U.S. pre-clearance facilities. With its priority mission of homeland security, CBP facilities consist of three major passenger processing areas such as primary processing and inspection, baggage claim, and a unified secondary processing and inspection area. Other required areas include detention suites, agricultural inspection and lab space, and operational support space for offices and staff support. Depending on the location, some FIS include canine enforcement and kennel space.

The future program's facility requirements and processing functions are assumed to reflect that of a two-step process adopted nationally. In this process all international arriving passengers are subject to primary inspection by CBP and a more selective secondary inspection. Although this is a national policy, implementation may vary at each airport based on local conditions and annual activity levels.

Although the Master Plan did not include a detailed international passenger forecast, the planning team and Airport determined it would be prudent to reserve space for potential future international operations accommodating up to 400 design hour passengers. In the absence of a fully developed FIS program outlining specific functions and room types, a high-level planning ratio of 80 square feet per design hour passenger was applied. This approach resulted in an estimated facility size of approximately 32,000 square feet.

3.1.3 Public Circulation

Ticket Lobby, Baggage Claim, Concourse and General Public Circulation

Ticket lobby and baggage claim circulation areas represent the unobstructed clear paths from any seating area and vestibule leading up to the ticket counter queue lease lines and the positive claim area within the baggage claim hall. The programmed ticketing and baggage claim areas utilize a clear cross-circulation width of 20 feet for both areas running the length of the ticket lobby and baggage claim respectively.

Concourse circulation represents the area beyond the security screening checkpoint and consists primarily of the central corridor running the length of the concourse. A width of 30 feet was utilized which is adequate for a double-loaded concourse, or gate holdrooms on both sides of the concourse, without moving walkways. However, the actual amount of secure circulation will depend on the proposed concourse configuration(s) and whether they consist of gates on one or both sides of the corridor as well as gates wrapping the ends of the concourse.

General circulation accounts for all other areas of the terminal that make up the public functions of the terminal and include areas such as vertical circulation elements, corridors, and any other architectural spaces that tie the functional public elements of the terminal together. Typical planning ratios range from 15 percent to 30 percent of the public serving spaces. A ratio of 20 percent was used for the program.

3.1.4 Non-Public Functions

Airport Administration

The existing Airport Administration area, encompassing approximately 17,000 square feet, has been preserved for integration into the future terminal program. As design development progresses, continued coordination with Airport leadership will be essential to identify any evolving requirements or potential space modifications that may impact overall space planning.

Airport Operations (Maintenance, Janitorial, Storage, and Shops)

Airport Operations space accounts for the building maintenance facilities and consists of shops, storage, office space, circulation, and janitorial space. Typical planning standards require one percent to two percent of the total functional areas. A ratio of two percent was utilized for future planning.

Mechanical, Electrical, Plumbing (MEP), and Communications

These programmed areas include all the utility support areas for the terminal and are generally a percentage of the enclosed functional areas of the terminal which typically range between 8 percent to 15 percent. For planning, a ratio of 8 percent was utilized. Any future building expansion will need to evaluate whether additional MEP capacity will be required.

Building Structure (Structural/Non-Net/Void)

This portion of the program ties together all the previous functional elements of the program to provide a better estimate of the total gross building area. Unusable space or special structures often make up this category of the program and depending on how the gross areas are determined a factor of two percent to five percent is typically added. For the purpose of this program a five percent ratio has been utilized.

3.1.5 Overall Program Demand Summary

The previous sections which described the programmatic approach to sizing terminal facility areas are commonly used as the first step during the planning and preliminary design of any expansion or new terminal project. As a project proceeds through the design process, functions such as ticketing, baggage areas, gate holdrooms, circulation areas, concessions, and other space-based requirements will often change due to the physical configuration of the design and cost considerations. As such areas like circulation will often provide the greatest variance to the program. For conceptual building expansion alternatives and site planning exercises, the 20-year full build was utilized which equates to the PAL 4 activity level of approximately 1.49 million annual enplanements and 13 contact gates.

The demand requirements presented in **Table 3.1-3, Terminal Facility Program Summary**, are considered a minimum generic facilities program recommended to support the design aircraft and their associated peak hour passenger activity levels. Overall calculated PAL 4 demand requires approximately 313,400 gross square feet. This area is inclusive of the 32,000 square feet FIS processing area. A more detailed program by functional area can be found in Appendix B.

Table 3.1-3 – Terminal Facility Program Summary

Program Area	Base Year (2025)		Planning Activity Levels (PALs)			
	Existing	Rec.	PAL 1	PAL 2	PAL 3	PAL 4
Public Space						
Circulation (SF) ¹	20,050	39,030	47,750	48,250	51,270	54,200
Ticket Lobby Queue (SF)	3,075	2,470	2,770	2,770	2,880	2,880
TSA SSCP (SF)	11,638	11,190	14,330	14,730	14,730	14,730
Queuing	823	1,800	2,490	2,780	2,780	2,780
# of Screening Lanes	3	3	4	4	4	4
Screening Area – inc. exit lane (SF)	7,670	6,370	7,970	7,970	7,970	7,970
Offices	3,145	3,020	3,870	3,980	3,980	3,980
Passenger Gate Holdrooms (SF)	23,500	32,930	36,220	36,220	39,510	42,810
Baggage Claim – Device/Retrieval (SF)	7,230	9,540	19,080	19,080	19,080	19,080
# of Devices	2	2	4	4	4	4
Linear Frontage	230	310	620	620	620	620
Meeter/Greeter Area	2,086	1,550	1,990	2,110	2,280	2,110
Restrooms – pre/post security (SF) ²	5,802	7,600	8,670	8,910	9,150	9,510
Misc. Tenant (SF) ³	3,880	3,320	3,560	3,690	3,830	3,980
Other – Info/Displays (SF)	150	150	150	150	150	150
<i>Subtotal (SF)</i>	<i>77,411</i>	<i>107,960</i>	<i>134,710</i>	<i>136,110</i>	<i>143,090</i>	<i>149,680</i>

- Notes: 1. Includes public seating, ticketing, bag claim, concourse, and general circulation.
 2. Includes Family Rooms, 2 Nursing Mother's/Lactation suites, and 2 SARA locations.
 3. Includes Executive Club, USO, Conference, & Amenity Lease Space.
 4. Includes 300 linear foot makeup unit.
 5. Includes rental car counters, queues, and associated offices.
 6. Includes associated offices and support spaces.
 7. Includes maintenance, janitorial, storage, and shops.
 8. Includes MEP, IT/Communications, and building structure (non-net/chase/open to below/void space).

Source: Allliance

Table 3.1-3 – Terminal Facility Program Summary (Continued)

Program Area	Base Year (2025)		Planning Activity Levels (PALs)			
	Existing	Rec.	PAL 1	PAL 2	PAL 3	PAL 4
Airline Space						
Ticketing – counter/ATO (SF)	10,788	4,280	4,790	4,790	5,040	5,040
# Agent Positions	25	15	17	17	18	18
# Self-Service Devices (SSD)	12	4	5	5	4	4
TSA Checked Baggage Screening (SF)	8,313	7,620	7,620	7,620	7,620	11,430
# EDS Machines	2	2	2	2	2	3
Outbound Baggage Makeup (SF) ⁴	18,584	8,750	10,000	10,630	11,250	13,130
Airside Operations/Storage (SF)	2,025	3,480	3,830	3,830	4,180	4,520
Inbound Baggage Claim Laydown (SF)	4,281	2,400	4,800	4,800	4,800	4,800
Inbound/Outbound Baggage Circ. (SF)	-	1,630	2,170	2,260	2,350	2,260
Baggage Service Office (SF)	580	1,000	1,250	1,250	1,250	1,500
Other Offices/Support Space (SF)	-	350	380	380	420	450
<i>Subtotal (SF)</i>	<i>44,571</i>	<i>29,510</i>	<i>34,840</i>	<i>35,560</i>	<i>36,910</i>	<i>43,490</i>
Concessions						
Rental Car (SF) ⁵	2,582	2,400	3,000	3,000	3,000	3,600
Landside/Storage (SF) ⁶	7,960	1,000	1,280	1,440	1,610	1,790
Airside/Storage (SF) ⁶	16,325	8,980	11,510	12,940	14,440	16,090
<i>Subtotal (SF)</i>	<i>26,867</i>	<i>12,380</i>	<i>15,790</i>	<i>17,380</i>	<i>19,050</i>	<i>21,480</i>
US CBP/FIS						
<i>Subtotal (SF)</i>	<i>-</i>	<i>32,000</i>	<i>32,000</i>	<i>32,000</i>	<i>32,000</i>	<i>32,000</i>
Non-Public Space						
Airport Administration (SF)	16,936	16,940	16,940	16,940	16,940	16,940
Restrooms/Circulation (SF)	540	6,120	6,800	6,910	7,070	7,770
Airport Operations (SF) ⁷	8,417	4,100	4,820	4,900	5,100	5,430
Building Operations/System (SF) ⁸	38,801	27,660	32,550	33,060	34,430	36,630
<i>Subtotal (SF)</i>	<i>64,694</i>	<i>54,820</i>	<i>61,110</i>	<i>61,810</i>	<i>63,540</i>	<i>66,770</i>
Total Net (SF)	189,308	225,400	265,190	269,390	280,560	298,500
Total Gross Area (SF)	213,543	236,670	278,450	282,860	294,590	313,420

3.2 Landside Programming

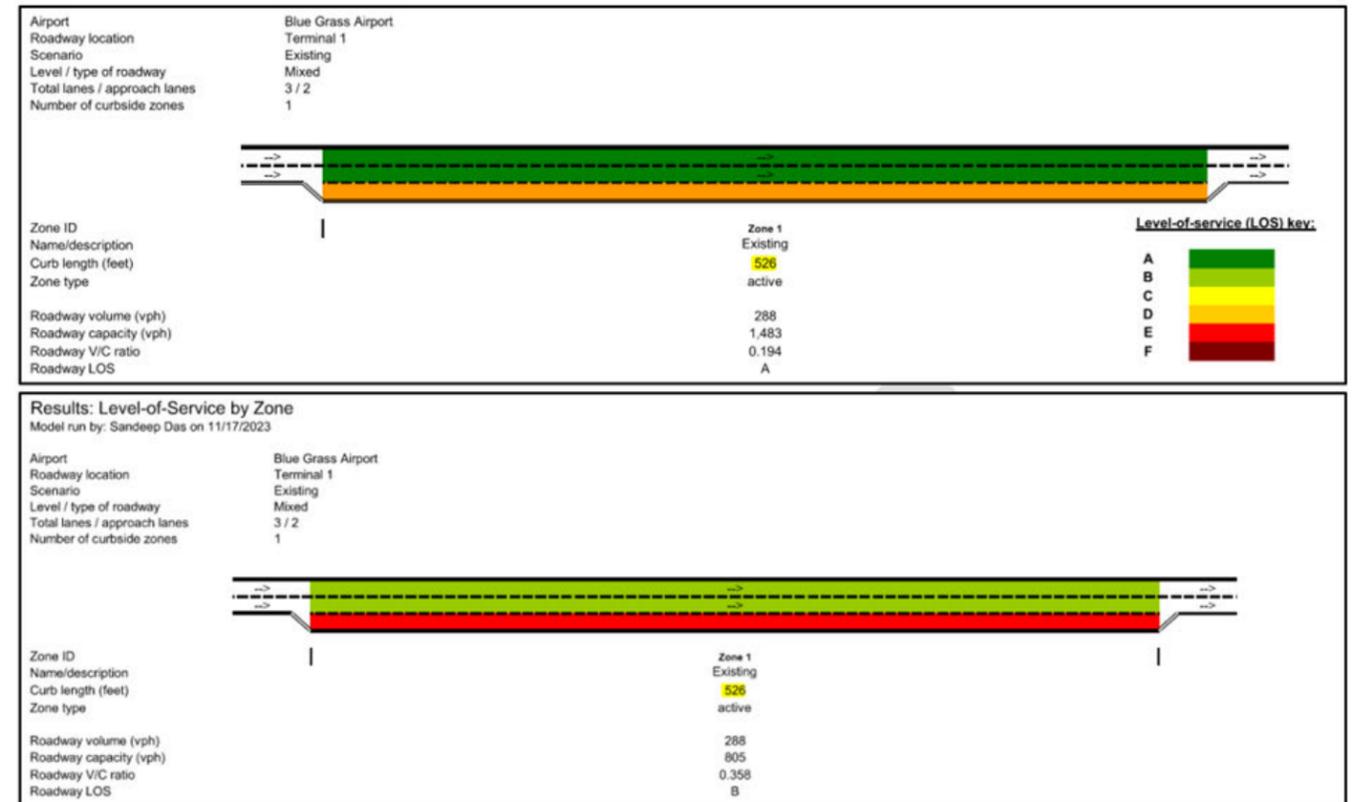
3.2.1 Terminal Curbfront

To support the planning for the future passenger terminal, Terminal Curbfront needs were reviewed and confirmed of the curbside analysis conducted in the Master Plan. Because the Master Plan was conducted during COVID-19, its curbside analysis was limited by reduced curbside activity. The analysis was therefore updated to include future facility needs and assumptions under more normal conditions, including Transportation Network Companies (TNC) (i.e., Uber or Lyft) trends and more recent airport growth projections. This analysis used industry-standard assumptions and tools as described in ACRP Report 40: *Airport Curbside and Terminal Area Roadway Operations (2010)*, ACRP Report 25: *Airport Passenger Terminal Planning and Design (2010)*, ACRP Report 215, *Transportation Network Companies: Impacts to Airport Revenues and Operations – Reference Guide (2020)*, and ACRP Report 274, *Accommodating Peer-to-Peer Carsharing at Airports (2024)*.

The existing curbside consists of a 520-foot-long curb lane with two through-lanes, a 10-foot median, and a through lane for shuttle and valet parking. As part of this planning effort, a model simulation was created for the baseline condition. **Exhibit 3.2-1, Baseline Curbfront Model**, presents the existing conditions of the terminal curbside at LEX. This baseline assumes double-parking capacity by utilizing the existing curbside length and evaluates various scenarios to illustrate how projected growth would impact the LoS within the current facility. While the model’s solutions primarily focus on optimizing curbside length, the addition of extra lane configurations can also be considered to increase parking capacity and address anticipated demand.

Furthermore, The Master Plan used ACRP Report 25’s planning metrics on curbside mode of transportation to determine mode splits, however, this guidance predates TNCs. Because the Master Plan was limited by COVID-19’s nonstandard passenger activity and because no new recent curb activity data is available, the Master Plan analysis was therefore updated based on general industry TNCs impacts, as documented in ACRP Report 215, and listed in **Table 3.2-1, Comparison of ACRP Modal Assumptions**. These updated mode split assumptions, combined with projected enplanement growth, formed the basis for estimating future curb length requirements.

Exhibit 3.2-1 – Baseline Curbfront Model



Source: WSP

Table 3.2-1 – Comparison of ACRP Modal Assumptions

Mode	ACRP Report 25	ACRP Report 215
Private Auto	56.18%	55%
Rental Car Shuttle	0.00%	0.00%
Taxis	22.47%	8%
TNCs	-	20%
Limousines	11.24%	8%
Hotel Shuttles	3.37%	3%
Airport Shuttles	0.00%	0%
Buses	3.37%	3%
Other	3.37%	3%

Source: ACRP Report 25, ACRP Report 215

Although observed industry standard dwell times for peer airports average 2–4 minutes, 5-minute dwell times were used in the updated analysis to be conservative and to best reflect the airport’s role, no additional data was collected.

The Master Plan recommended a future configuration of 3 inner and 3 outer lanes separated by a median. For consistency, this configuration was assessed for each PAL. Additionally, each PAL’s demand was also assessed using an assumption of 7.5 minutes of dwell time. The results of these scenarios are presented in **Table 3.2-2, Required Terminal Curbfront Lengths.**

Table 3.2-2 – Required Terminal Curbfront Lengths

	PAL 1	PAL 2	PAL 3	PAL 4
Required Curbfront Length (ft.) 5-minute Dwell Time	500	530	560	600
Required Curbfront Length (ft.) 7.5-minute Dwell Time	540	570	600	700

Notes: Assumes “Optimal” Level of Service or LoS “C” and double active loading/unloading.
Source: WSP

Maintaining that 41 percent of passengers park at the airport without utilizing the Terminal Curbfront, with the remaining 59 percent arriving by means that will utilize the curbsfront, the assessment indicates that the curbsfront should increase from 520 feet today to a total of 600 to 700 linear feet. At that total length and assuming double loading/unloading lanes, the curbsfront would be sufficient to accommodate demand through the planning period. This analysis also assumed that all vehicles would utilize the curbsfront for passenger pick-up and drop-off, with no consideration given to a proposed Ground Transportation Center (GTC). The provision of a GTC would further relieve the pressure on the terminal curbsfront thereby improving the LoS throughout the planning period.

In addition to the additional terminal curbsfront length, the curbsfront approach length should also be increased from 75 feet today to a minimum of 180 feet in the future. This increase in approach length would allow for better sightlines of approaching vehicles and thereby a more efficient use of the entire curbsfront length.

3.2.2 Public Vehicle Parking

LEX currently has approximately 3,381 public parking spaces that are spread out through both surface parking lots, an overflow surface parking lot and a parking deck. These spaces are generally centrally located allowing for direct access to the Passenger Terminal without additional transportation needs like shuttles, trams, etc.

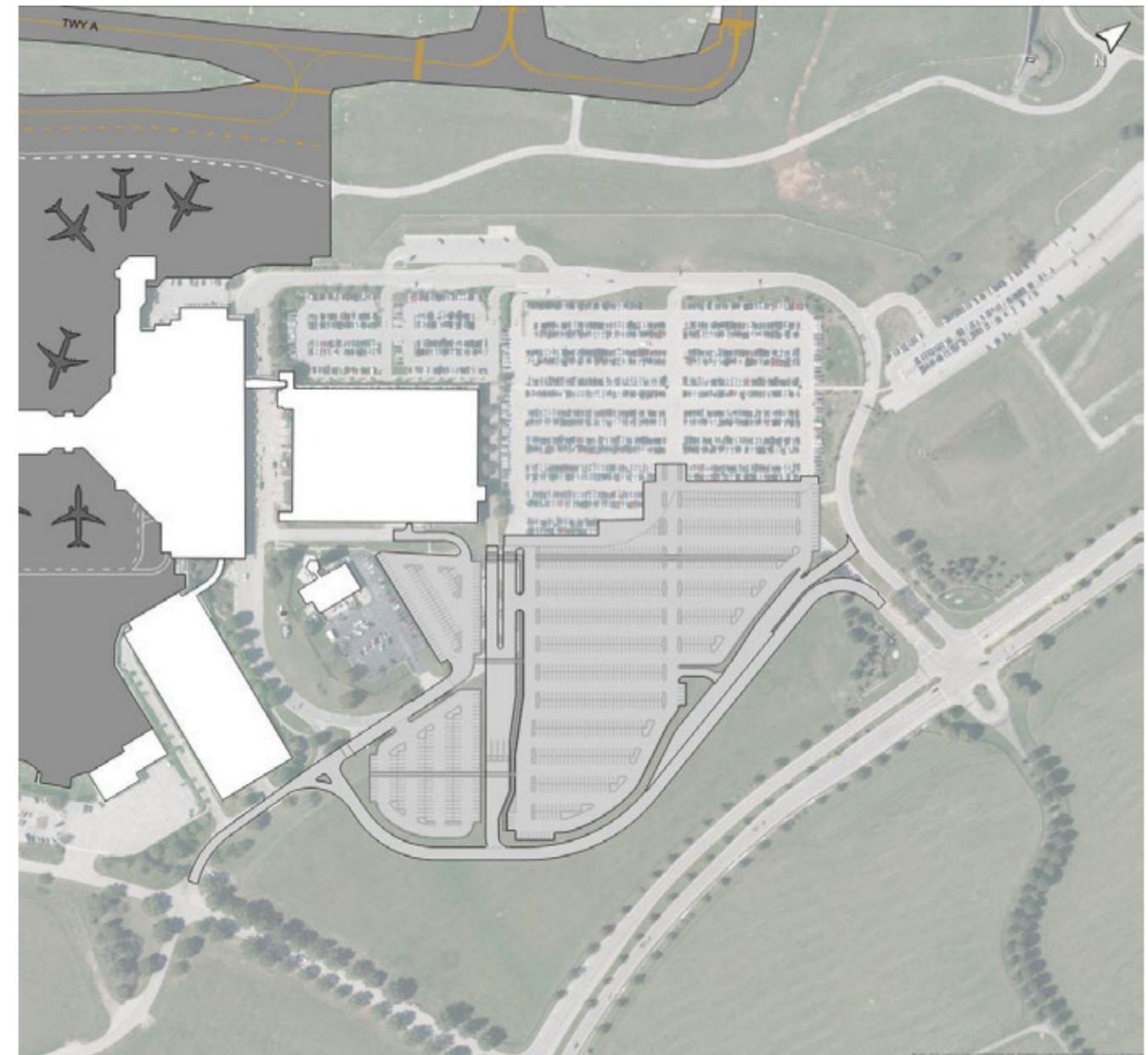
The analysis performed assumes the inclusion of all additional parking spaces provided by the 2025 surface parking expansion project that is currently under construction. This additional surface parking lot will include an additional 822 spaces as well as roadway realignment, lighting, landscaping, utility corridors, and drainage improvements. The existing public parking is broken into both long-term and short-term parking with a ratio of 1.71 (Long/Short-term parking). **Table 3.2-2, Existing Public Parking Facilities**, presents the configuration of the existing public parking facilities including the 2025 parking improvements.

Parking counts from September 2023 through September 2024 were reviewed to confirm the Master Plan's projected parking demand was consistent with current parking demand being experienced at the Airport. The data indicated the following:

- Peak Short-term peak demand: 1,169 spaces in July 2024
- Short-term parking demand at or above 85 percent capacity (effective full): 8 of 12 months
- Peak Long-term peak demand: 958 spaces in November 2023
- Long-term parking at or above 85 percent capacity (effective full): 11 of 12 months
- Overflow lot peak demand: 516 spaces in June 2024

These existing peak demands indicate that the current parking supply is at or above capacity most of the year.

Exhibit 3.2-2 – Existing Public Parking Facilities



Source: CMT, WSP, Hanson

Public Parking Demand

Future parking demand is directly related to the number of total annual passenger enplanements. While there is a mixture of services between short-term, long-term, rideshare services and taxi/shuttle services, that same mixture is anticipated to be consistent throughout the planning period as the number of enplanements increases. Based on current industry understanding, it does not appear that long-term autonomous operations will significantly affect the mixture for planning purposes through PAL 4. Therefore, the annual growth rate of the parking demand is anticipated to follow the projected growth rates of annual enplanements.

Furthermore, looking at the Master Plan’s projected parking demand for the early years of its forecast period is approximately following the existing parking demand and enplanement growth rates. **Table 3.2-3, Projected Public Parking Demand**, presents the demand for public parking throughout the planning period.

Table 3.2-3 – Projected Public Parking Demand

	Existing	PAL 1	PAL 2	PAL 3	PAL 4
Short-Term Parking					
Current Supply	1,246	-	-	-	-
Effective Full (85% of supply)	1,059	-	-	-	-
Peak Demand	1,169	1,734	1,948	2,174	2,424
True Surplus (Deficit)	80	(485)	(702)	(928)	(1,178)
Effective Surplus (Deficit)	(110)	(675)	(889)	(1,115)	(1,365)
Long-Term Parking					
Current Supply	987	-	-	-	-
Effective Full (85% of supply)	839	-	-	-	-
Peak Demand	958	1,421	1,597	1,782	1,987
True Surplus (Deficit)	29	(434)	(610)	(795)	(1,000)
Effective Surplus (Deficit)	(119)	(582)	(758)	(943)	(1,148)
Total Public Parking Demand (with 2025 expansion)					
Current Supply	3,381	-	-	-	-
Effective Full (85% of supply)	2,874	-	-	-	-
Total Peak Demand	2,995	3,840	4,315	4,816	5,369
True Surplus (Deficit)	386	(459)	(934)	(1,435)	(1,988)
Effective Surplus (Deficit)	(121)	(966)	(1,441)	(1,942)	(2,495)

Source: WSP

3.2.4 Rental Car Ready Return

As part of the Rental Car Ready Return Parking analysis, the operations and capacity of the existing ready return parking deck located south of Terminal Dr. and west of Air Freight Dr. was reviewed in depth. Currently the deck serves three rental car brand families: Avis, Enterprise, and Hertz with the market share split 25.7 percent/52.8 percent/21.5 percent (based on parking spaces), respectively. Interviews with the Enterprise brand family were also conducted onsite, which provided a better understanding of operations and needs of the rental car companies.

With input received from the rental car operators, projections of ready return needs were developed to understand the order of magnitude of growth in the facility that would be needed throughout the planning period. This input indicated that approximately 50 percent growth in rental car demand is anticipated over the next 20 years. This slightly outpaces the anticipated enplanement growth at 33.33 percent. **Table 3.2-4, Rental Car Ready Return Demand Projections**, presents the project demand by brand family through the planning period.

Table 3.2-4 – Rental Car Ready Return Demand Projections

Brand Family	Existing Total Spaces	PAL 4 Ready Spaces	PAL 4 Return Spaces	PAL 4 Total Spaces
AVIS	56	135	107	242
Enterprise	115	270	213	483
Hertz	47	135	107	242
TOTAL	218	540	427	967

Source: WSP

3.2.5 Ground Transportation Center

As a part of the assessment of the overall roadway network and curbside at LEX, one of the most important needs identified was that of a standalone GTC. As part of this effort, a comprehensive strategy for the development of a new transportation hub, including improvements to the existing short-term parking deck was developed. The core objective with the GTC was to enhance overall safety and operational efficiency, while reducing roadway congestion by removing TNCs from the curbside. This approach aligns with national best practices outlined in ACRP Reports 215 and 266, which highlight GTCs as a flexible, mode-neutral solution for managing evolving commercial ground transportation demands. Airports of similar size to LEX, such as Harrisburg International Airport (MDT), Long Island MacArthur Airport (ISP), and Dayton International Airport (DAY), have successfully implemented GTC facilities to improve passenger wayfinding, reduce curb congestion, and accommodate changes in TNC and shuttle activity.

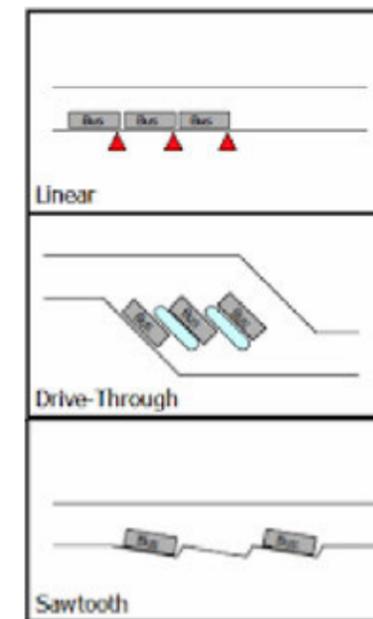
Currently, TNCs and shuttles pick up/drop off at the terminal curbside. These operations can add congestion especially during high volume events. Furthermore, customers often times will have to cross multiple lanes of traffic to load or unload from a TNC vehicle. Additionally, TNC's can be difficult to find along the length of the curb for customers.

The recommended 25-space capacity for the GTC was derived by applying industry-standard curb demand forecasting methods from ACRP Report 215, adjusted for LEX's projected peak-hour commercial vehicle activity at PAL 4. The analysis began with projected enplanement levels and updated mode-split assumptions reflecting increased TNC activity (20 percent of total trips, per ACRP 215). Applying observed dwell times and turnover rates from peer airports of similar scale, the projected simultaneous vehicle occupancy was calculated. Additional spaces were included to provide operational flexibility during irregular operations and to maintain LoS C or better. This resulted in a total of 25 spaces, inclusive of one ADA-accessible position, as the optimal balance between meeting demand, minimizing congestion, and maintaining a compact, cost-effective footprint. Once the capacity requirements were determined, multiple operational layouts were evaluated to identify the configuration that best meets safety, efficiency, and space constraints, including:

- Sawtooth
- Parallel
- Drive-through

Exhibit 3.2-3, GTC Configuration Options, presents the three basic configuration options for GTCs. Based on industry guidance published in ACRP Report 215 and special limitations, the drive-through TNC layout accommodates the existing conditions the best while providing the highest level of safety and best operational efficiency.

Exhibit 3.2-3 – GTC Configuration Options



Source: ACRP Report 215

Section Four

Conceptual Alternatives Development & Evaluation

The following sections describe the conceptual alternatives developed as part of the Terminal Area Plan, including their evaluation, shortlisting, and subsequent refinements. The main emphasis is on the development and refinement of Passenger Terminal Concepts. Additionally, this section outlines conceptual alternatives for Airport Landside Facilities, Utility Infrastructure, and Stormwater and Deicing Fluid Collection facilities. For non-terminal facilities, most are presented without evaluation or shortlisting, as they are dependent on the configuration of Passenger Terminal Facilities and are not assessed independently.

4.1 Passenger Terminal Facilities

The development of Conceptual Alternatives for the TAP was based on the recommendations from the Master Plan, which served as the foundation for further concept analysis. Eleven concepts were created during this process, starting with the Master Plan Recommendation and including ten additional concepts, all scaled according to the terminal program described in Section 3. Each concept was assessed qualitatively throughout the process utilizing the following criteria:

- Airport Traffic Control Tower (ATCT) Line of Sight
 - What is the impact on the controller's sight lines from the existing ATCT?
- Phasing/Constructability
 - What is the operational effectiveness of the initial phases?
 - How effective is the utilization of the limited land area available for terminal development?
 - How much enabling work is required?
- Long-term Expansion Capability
 - What is the potential for future expandability beyond the prescribed program?
- Operational Considerations
 - How efficiently can the airside operate (least complex taxiway geometry)?
 - Does the concept provide obvious opportunity for the development of a Consolidated Receiving and Distribution Facility (CRDF)?
 - Does the concept provide obvious opportunity for enhanced revenue potential (concessions/parking)?
 - Does the concept provide the opportunity to develop Remote Overnight (RON) aircraft parking positions?
- Customer Experience (during construction)
 - What is the impact to the experience of the passenger during construction of the concept?
- Customer Experience (after construction)
 - Does the concept enhance the entry sequencing and experience of the passenger (Terminal Drive/wayfinding)?
 - What are the impacts to walking distances (airside and landside)?
- Sustainability
 - How much does the concept reuse existing infrastructure and systems?
 - What is the impact to existing operations (airside/landside)?
- Budget Considerations

4.1.1 Level One Concepts

The eleven concepts developed are presented in **Exhibit 4.1-1 through Exhibit 4.1-11**. It is important to note that the concepts at this level do not include details related to the subordinate facilities such as landside improvements, utilities, or stormwater collection facilities. At this point of the process, the intent is simply to understand the ability of the various concepts to provide the core functions of the passenger terminal within the available land envelop, and each's impact on other facilities at the airport. Subsequent iterations will continue to add additional detail to the shortlisted concepts.

Exhibit 4.1-1 – Concept 1A – Master Plan (Rightsized)



Source: Alliance, CMT

Exhibit 4.1-2 – Concept 1B – Master Plan (Modified)



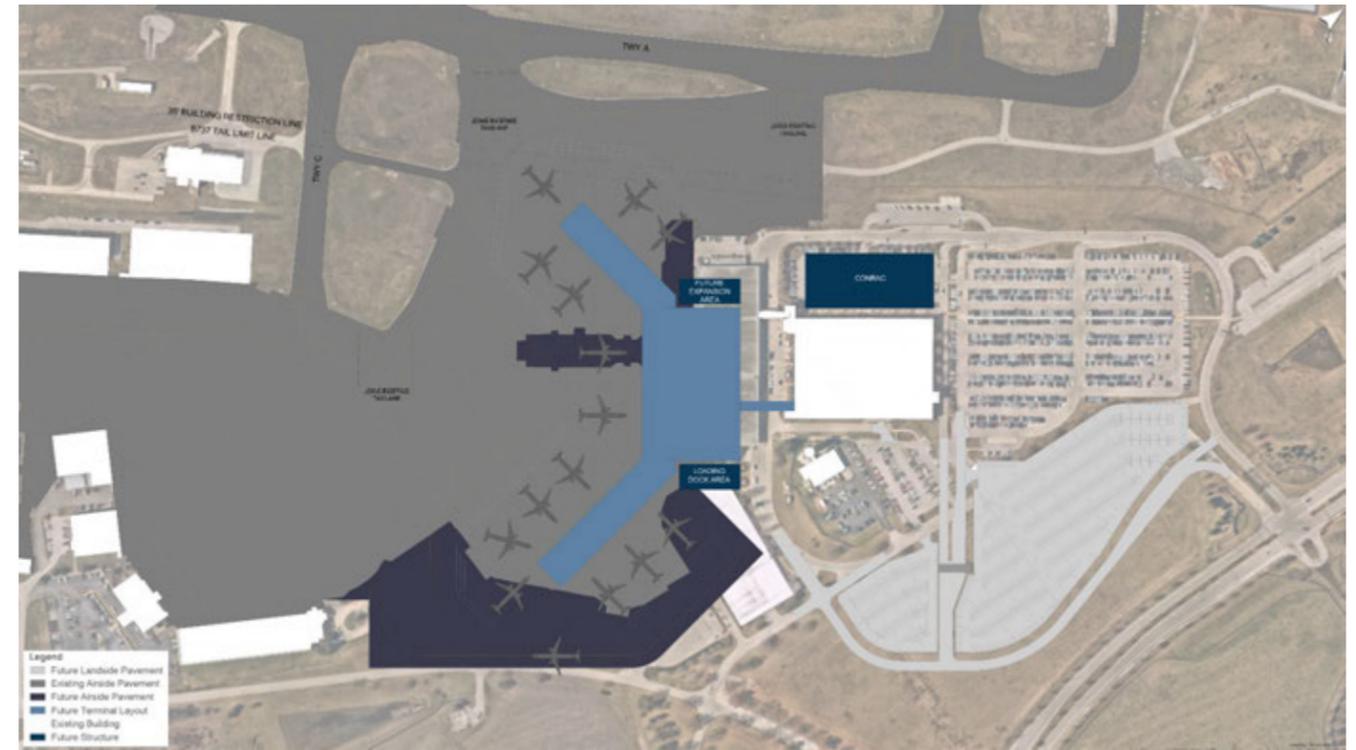
Source: Alliance, CMT

Exhibit 4.1-3 – Concept 2 – Linear



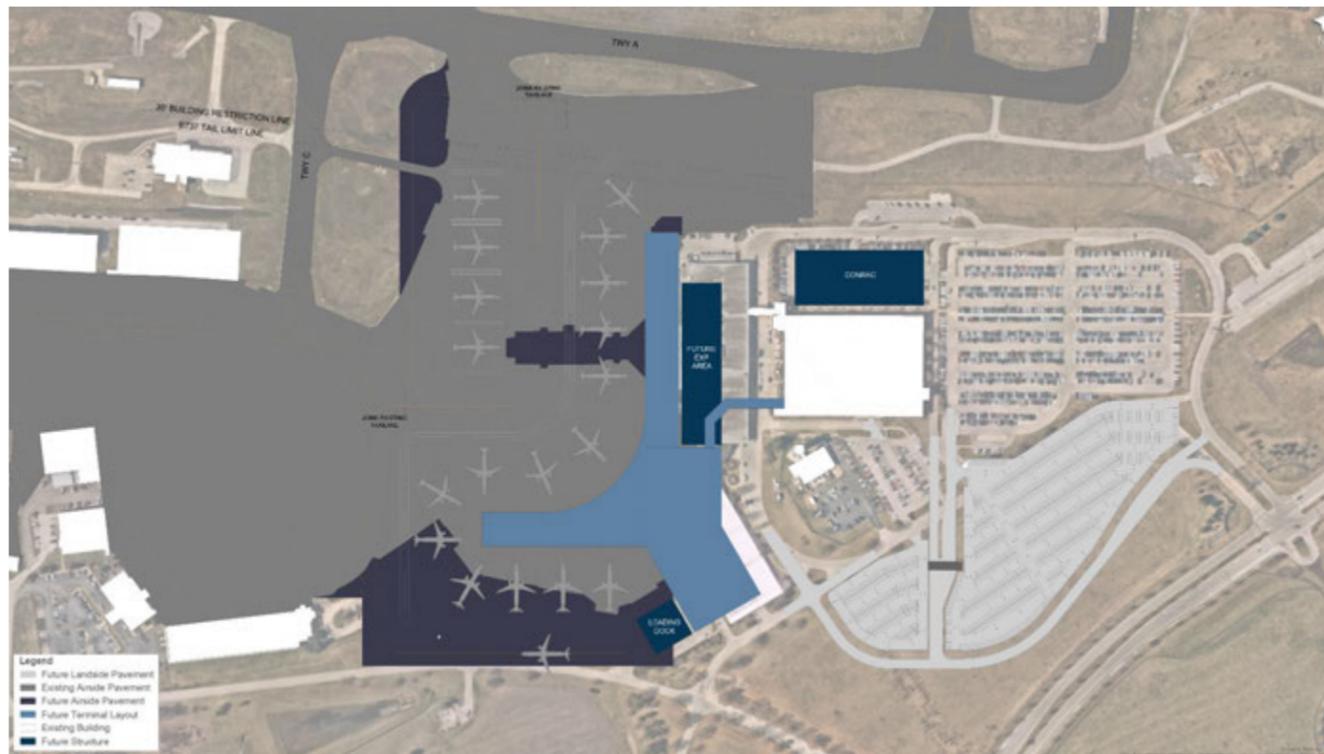
Source: Alliance, CMT

Exhibit 4.1-4 – Concept 3 – Wings



Source: Alliance, CMT

Exhibit 4.1-5 – Concept 4A – L



Source: Alliance, CMT

Exhibit 4.1-6 – Concept 4B – L



Source: Alliance, CMT

Exhibit 4.1-7 – Concept 5 – L2



Source: Alliance, CMT

Exhibit 4.1-8 – Concept 6A – J1



Source: Alliance, CMT

Exhibit 4.1-9 – Concept 6B – J2



Source: Alliance, CMT

Exhibit 4.1-10 – Concept 7 - Y



Source: Alliance, CMT

Exhibit 4.1-11 – Concept 8



Source: Alliance, CMT

4.1.2 Shortlisted Level One Concepts

Through consultation with the Airport Leadership team, the eleven conceptual alternatives were shortlisted down to the following six for further consideration and evaluation by the wider Airport team:

- Concept 1A – Master Plan (Rightsized)
- Concept 1B – Master Plan (Modified)
- Concept 3 – Wings
- Concept 4B – L1
- Concept 5 – L2
- Concept 6B – J

These concepts were reviewed in detail during an in-person workshop with the Airport team on November 26, 2024. During that workshop the participants worked to perform a more detailed evaluation scoring exercise to identify the concepts to carry forward for further refinement. This exercise utilized a numeric rating scale of 1 to 5 applied to the eight primary evaluation criteria presented in Section 4.1. The definition of each rating score is presented in **Table 4.1-1, Evaluation Scoring Scale**.

Table 4.1-1 – Evaluation Scoring Scale

Score	Definition
1	Performs poorly
2	Performs Marginally
3	Performs OK
4	Performs Very Well
5	Performs Exceedingly Well

Source: CMT

Concept 1A – Master Plan (Rightsized)

Concept 1A most closely resembles the passenger terminal development recommendation made by the Master Plan. In fact, the configuration is identical with the exception of rightsizing the overall footprint of the building to match the need identified in the terminal program presented in Section 3. This concept provides two parallel double-loaded (aircraft gates on both sides) concourses extending out from a two-level terminal headhouse perpendicularly. The new concourses are separated by two parallel Aircraft Design Group (ADG) III taxilanes. The development of Concept 1A requires the realignment of Airport Road to allow for adequate taxilane separations around the two concourses.

The configuration of Concept 1A as depicted in **Exhibit 4.2-12, Concept 1A (Level One)**, provides for a total of 14 full-size narrowbody gates capable of accommodating an Airbus A321 or Boeing 737-Max9 aircraft at each position. Concept 1A is expandable to a total of 19 ultimate positions if necessary. The evaluation scoring for Concept 1A is presented in **Table 4.1-2, Concept 1A Level One Scoring**.

Table 4.1-2 – Concept 1A Level One Scoring

Criteria	Score
ATCT Line of Sight Considerations	1
Phasing/Constructability	1
Long-Term Expansion Capability	4
Operational Considerations	3
Customer Experience (during construction)	1
Customer Experience (after construction)	3
Sustainability	4
Budget Considerations	1
TOTAL	18

Source: CMT

Exhibit 4.1-12 – Concept 1A (Level One)



Source: CMT, Alliance, WSP

Concept 1B – Master Plan (Modified)

Similar to Concept 1A, Concept 1B, is identical to the Master Plan recommendations in terms of the configuration of the concourses and aircraft parking positions. The difference between Concept 1A and Concept 1B is the location of the terminal headhouse. In Concept 1B, the terminal headhouse has been shifted further to the south with the intention of simplifying construction phasing by enabling the majority of new headhouse construction to occur outside the footprint of the existing terminal headhouse. Like Concept 1A, the development of Concept 1B also requires the realignment of Airport Road.

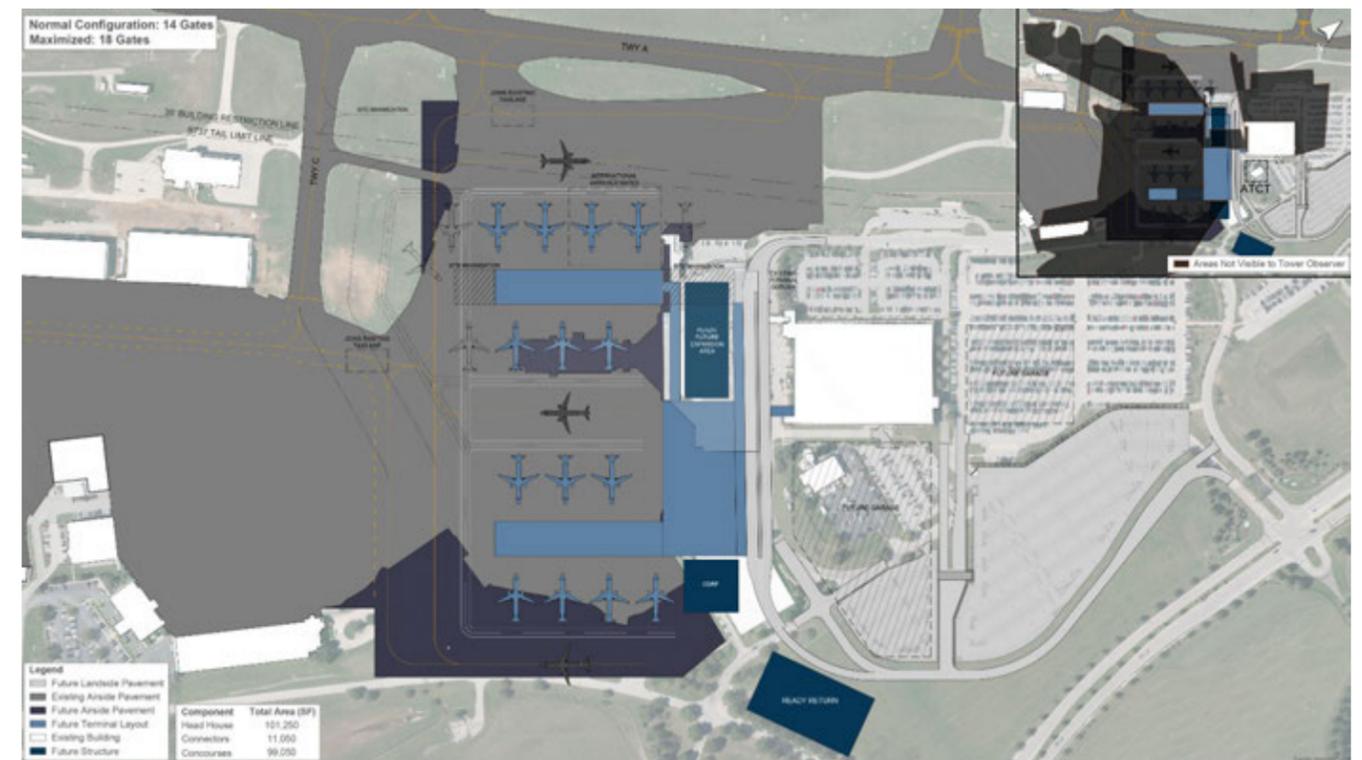
The configuration of Concept 1B as depicted in **Exhibit 4.1-13, Concept 1B (Level One)**, provides for a total of 14 full-size narrowbody gates capable of accommodating an Airbus A321 or Boeing 737-Max9 aircraft at each position. Concept 1B is expandable to a total of 19 ultimate positions if necessary. The evaluation scoring for Concept 1A is presented in **Table 4.1-3, Concept 1B Level One Scoring**.

Table 4.1-3 – Concept 1B Level One Scoring

Criteria	Score
ATCT Line of Sight Considerations	2
Phasing/Constructability	3
Long-Term Expansion Capability	3
Operational Considerations	2
Customer Experience (during construction)	1
Customer Experience (after construction)	3
Sustainability	4
Budget Considerations	2
TOTAL	20

Source: CMT

Exhibit 4.1-13 – Concept 1B (Level One)



Source: CMT, Alliance, WSP

Concept 3 – Wings

Concept 3 is a full departure from the terminal development recommendations of the Master Plan. This concept provides two double-loaded concourses extending out from a two-level terminal headhouse at approximately 45-degree opposite angles. The new concourses are served by perimeter ADG III taxilanes. The development of Concept 3 requires the realignment of Airport Road to allow for adequate taxilane separations around the two concourses.

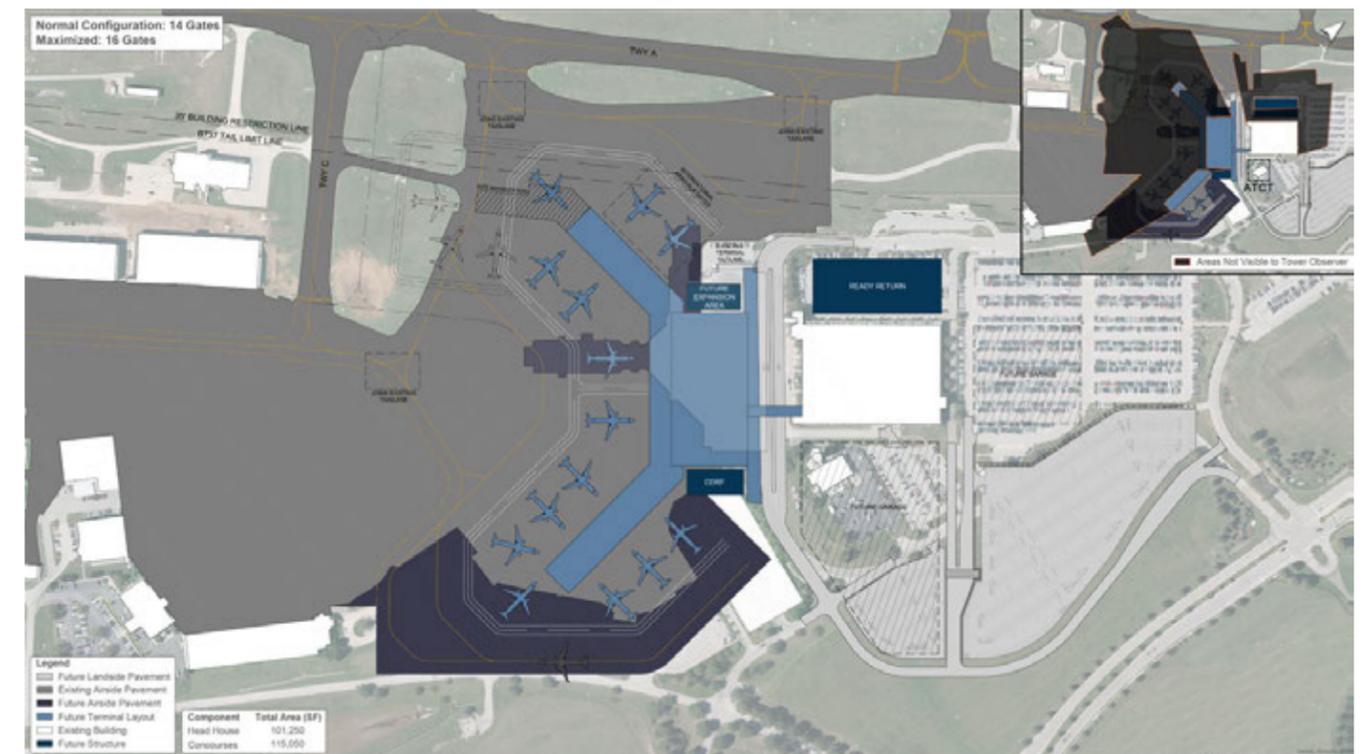
The configuration of Concept 3 as depicted in **Exhibit 4.1-14, Concept 3 (Level One)**, provides for a total of 14 full-size narrowbody gates capable of accommodating an Airbus A321 or Boeing 737-Max9 aircraft at each position. Concept 3 is expandable to a total of 16 ultimate positions if necessary. The evaluation scoring for Concept 3 is presented in **Table 4.1-4, Concept 3 Level One Scoring**.

Table 4.1-4 – Concept 3 Level One Scoring

Criteria	Score
ATCT Line of Sight Considerations	2
Phasing/Constructability	1
Long-Term Expansion Capability	0
Operational Considerations	4
Customer Experience (during construction)	2
Customer Experience (after construction)	4
Sustainability	4
Budget Considerations	1
TOTAL	18

Source: CMT

Exhibit 4.1-14 – Concept 3 (Level One)



Source: CMT, Alliance, WSP

Concept 4B – L

Concept 4B proposes the development of a curved concourse extending to the West into a double-loaded concourse. Immediately to the East of the double-loaded section of concourse is a proposed two-level terminal headhouse that roughly follows the alignment of Terminal Drive. In the ultimate configuration, a single-loaded concourse is developed over the site of the existing terminal headhouse. This configuration allows for a majority of the terminal expansion to occur without impact to existing operations and gates. This concept does not require the realignment of Airport Road.

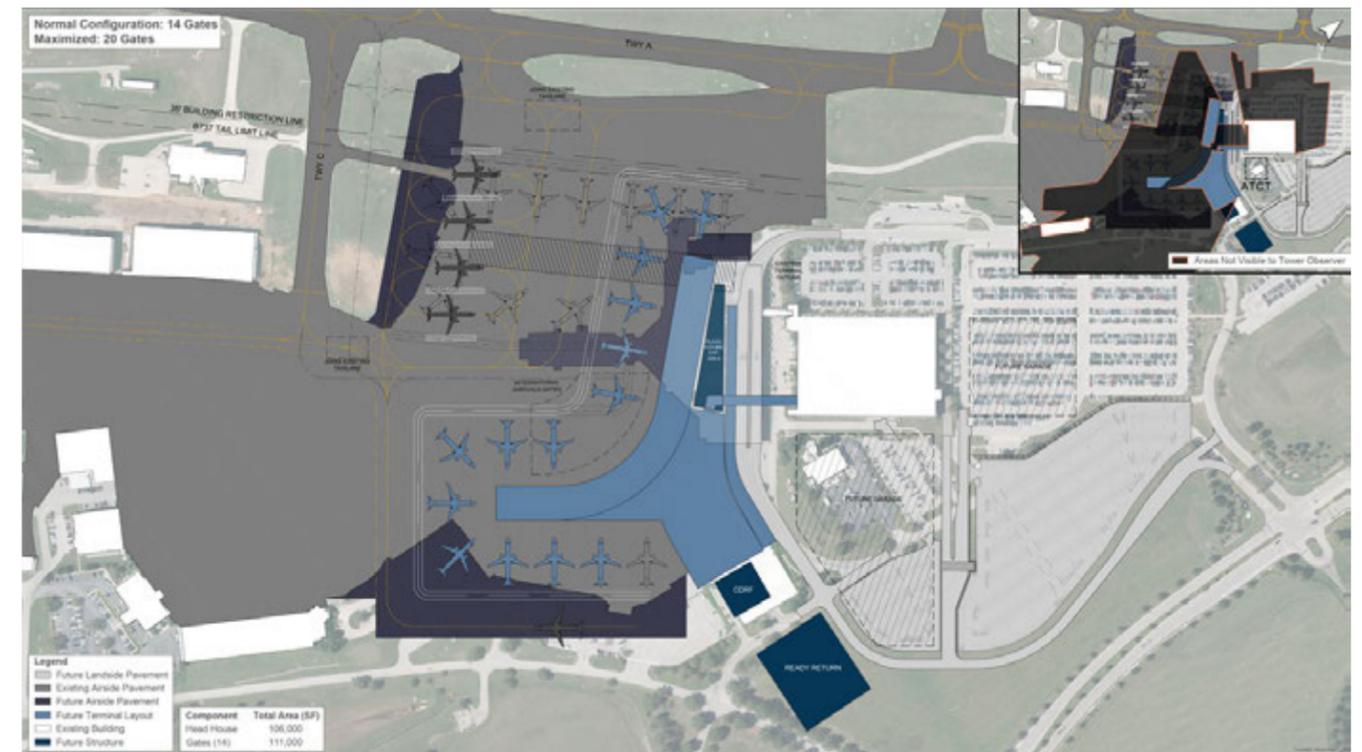
The configuration of Concept 4B as depicted in **Exhibit 4.1-15, Concept 4B (Level One)**, provides for a total of 14 full-size narrowbody gates capable of accommodating an Airbus A321 or Boeing 737-Max9 aircraft at each position. Concept 4B is expandable to a total of 20 ultimate positions if necessary. The evaluation scoring for Concept 4B is presented in **Table 4.1-5, Concept 4B Level One Scoring**.

Table 4.1-5 – Concept 4B Level One Scoring

Criteria	Score
ATCT Line of Sight Considerations	5
Phasing/Constructability	4
Long-Term Expansion Capability	5
Operational Considerations	4
Customer Experience (during construction)	5
Customer Experience (after construction)	5
Sustainability	4
Budget Considerations	5
TOTAL	37

Source: CMT

Exhibit 4.1-15 – Concept 4B (Level One)



Source: CMT, Alliance, WSP

Concept 5 – L2

Similar to Concept 3, Concept 5 proposes two double-loaded concourses extending out from a two-level terminal headhouse at approximately 45-degree opposite angles. The primary difference between Concept 3 and Concept 5 is that in Concept 5, the concourses are separated from the headhouse by a concourse connector. This has the effect of being able to provide more aircraft gates closer to the headhouse by allowing for a greater length of the concourses to be double-loaded. As is the case with Concept 3, the new concourses are served by perimeter ADG III taxilanes. The development of Concept 5 requires the realignment of Airport Road to allow for adequate taxilane separations around the two concourses, albeit of a smaller magnitude.

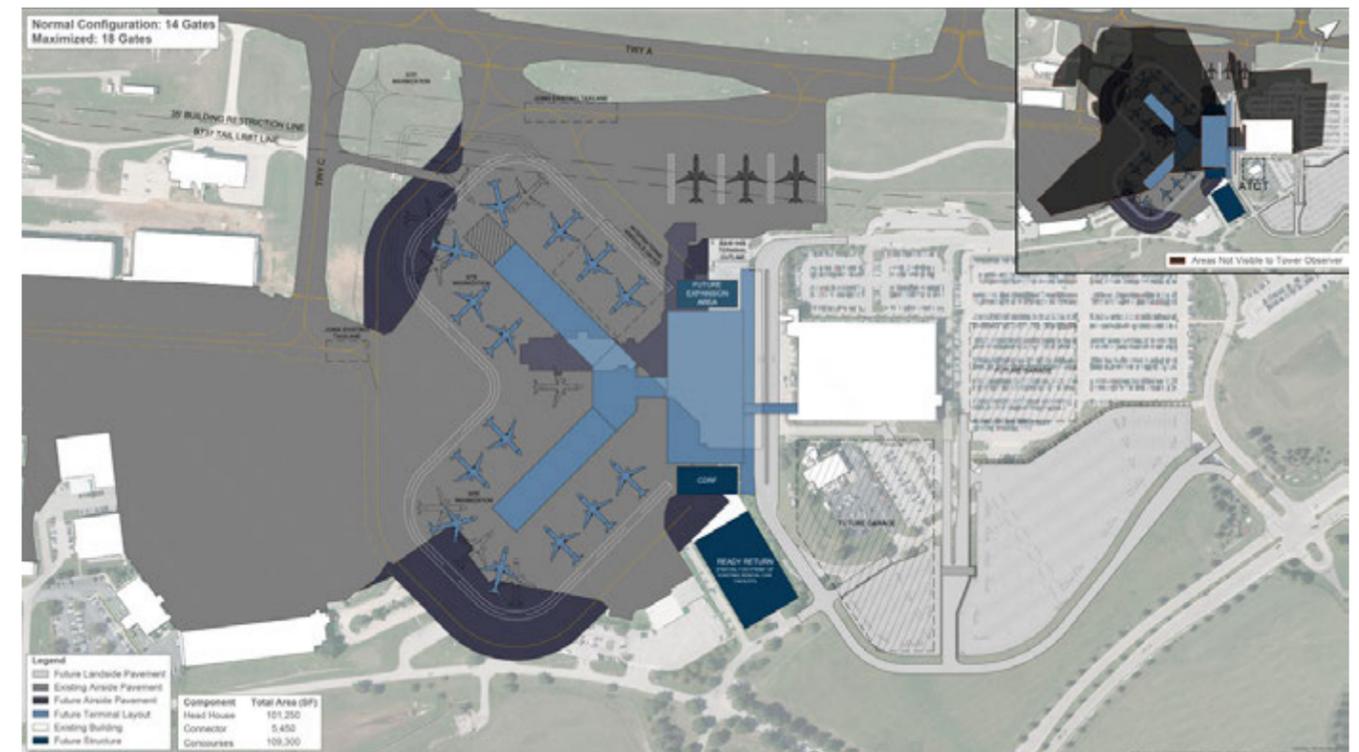
The configuration of Concept 5 as depicted in **Exhibit 4.1-16, Concept 5 (Level One)**, provides for a total of 14 full-size narrowbody gates capable of accommodating an Airbus A321 or Boeing 737-Max9 aircraft at each position. Concept 5 is expandable to a total of 18 ultimate positions if necessary. The evaluation scoring for Concept 5 is presented in **Table 4.1-6, Concept 5 Level One Scoring**.

Table 4.1-6 – Concept 5 Level One Scoring

Criteria	Score
ATCT Line of Sight Considerations	2
Phasing/Constructability	1
Long-Term Expansion Capability	3
Operational Considerations	3
Customer Experience (during construction)	1
Customer Experience (after construction)	5
Sustainability	5
Budget Considerations	1
TOTAL	21

Source: Source Information

Exhibit 4.1-16 – Concept 5 (Level One)



Source: CMT, Alliance, WSP

Concept 6B – J2

Similar to Concept 4B, Concept 6B proposes the development of a curved concourse extending to the West. The primary difference is that the concourse is entirely single-loaded and therefore extends further West in the General Aviation area. Immediately to the east of the curved section of concourse is a proposed two-level terminal headhouse. In the ultimate configuration, the single-loaded concourse continues to the north over the site of the existing terminal headhouse with aircraft parking wrapped around the north end. This configuration also allows for a majority of the terminal expansion to occur without impact to existing operations and gates. This concept does not require the realignment of Airport Road.

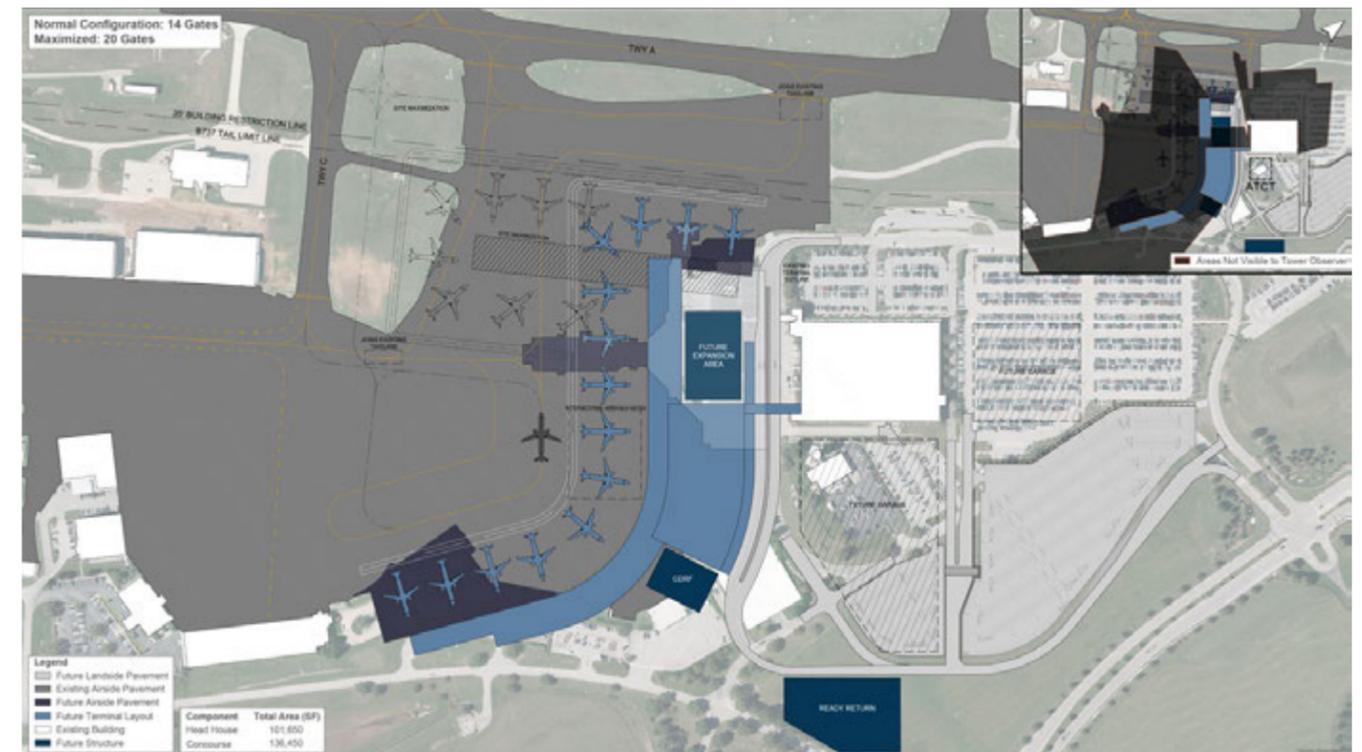
The configuration of Concept 6B as depicted in **Exhibit 4.1-17, Concept 6B (Level One)**, provides for a total of 14 full-size narrowbody gates capable of accommodating an Airbus A321 or Boeing 737-Max9 aircraft at each position. Concept 6B is expandable to a total of 20 ultimate positions if necessary. The evaluation scoring for Concept 6B is presented in **Table 4.1-7, Concept 6B Level One Scoring**.

Table 4.1-7 – Concept 6B Level One Scoring

Criteria	Score
ATCT Line of Sight Considerations	5
Phasing/Constructability	3
Long-Term Expansion Capability	4
Operational Considerations	3
Customer Experience (during construction)	4
Customer Experience (after construction)	4
Sustainability	4
Budget Considerations	3
TOTAL	30

Source: Source Information

Exhibit 4.1-17 – Concept 6B (Level One)



Source: CMT, Alliance, WSP

Level One Evaluation

Table 4.1-8, Level One Concept Evaluation, provides a comparative analysis of each concept’s scores and corresponding overall rankings. According to this evaluation, Concept 4B achieved the highest score and will be advanced for further refinement and assessment. Additionally, through consultation with the Airport’s leadership team, Concept 1A has also been selected for continued development to serve as the baseline of the Master Plan Recommendation during subsequent program evaluations.

Table 4.1-8 – Level One Concept Evaluation

Criteria	Concept 1A	Concept 1B	Concept 3	Concept 4B	Concept 5	Concept 6B
ATCT Line of Sight Considerations	1	2	2	5	2	5
Phasing/Constructability	1	3	1	4	1	3
Long-Term Expansion Capability	4	3	0	5	3	4
Operational Considerations	2	2	4	4	3	3
Customer Experience (during construction)	1	1	2	5	1	4
Customer Experience (after construction)	3	3	4	5	5	4
Sustainability	4	4	4	4	5	4
Budget Considerations	1	2	1	5	1	3
TOTAL	17	20	18	37	21	30
RANK	6	4	5	1	3	2

Source: CMT

4.1.3 Concept Refinement & Details

As the study progressed and concepts were eliminated, Concepts 1A and 4B were redesigned as Concept 1 and Concept 4 (1A and 4B respectively) for simplicity of reference moving forward.

Concept 1

Concept 1 as previously discussed is an iteration on the preferred alternative presented the Airport’s recent Master Plan. The central processor or terminal headhouse which includes airline ticketing and check-in, security screening, inbound and outbound baggage, and airport administration is flanked by two concourses in a u-shaped configuration. The terminal headhouse includes all major programmatic and functional spaces on a single level while the structure itself is a two-story volume. Passengers arriving at the airport for a flight enter the building on Level One and ascend to Level Two after processing through the security screening checkpoint.

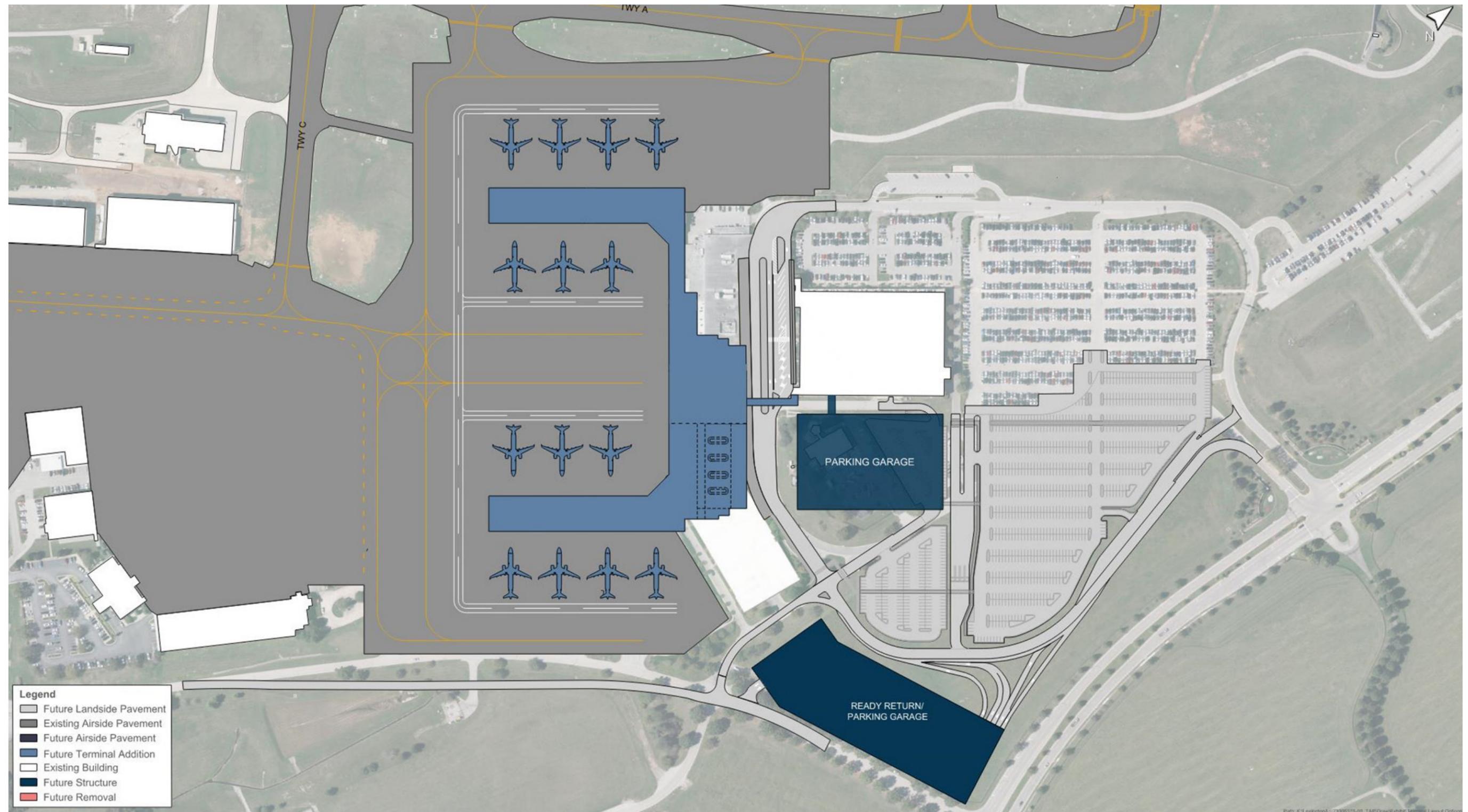
The terminal headhouse is positioned similar to the existing building, maintaining the current separation from the landside façade of the terminal to the parking structure. The concourses include programmatic functional area on each of two levels. A majority of the level one program areas are operational support space for airline tenants and/or building support space such as mechanical and electrical rooms or understory spaces reserved for future expansion of the terminal. Level two program areas include gate holdroom seating areas, restrooms and passenger amenities as well as commercial program spaces.

Concourse 1, south of the terminal headhouse, preserves space on Level One for a future FIS area to process international flights arriving at LEX. A detailed layout was not developed as part of the terminal area plan, however the area identified is sized to meet the program requirements of an FIS capable of processing 400 passengers per hour. Roughly the equivalent of two narrowbody aircraft arriving around the same time. A sterile corridor at the concourse level and vertical circulation from the concourse level down to the FIS would need to be provided if the FIS is constructed in the future.

It was noted during the evaluation of concepts, that the u-shaped configuration of the terminal headhouse and concourse may negatively impact the line of site from the ATCT in its current location. The relocation of the ATCT was discussed and noted as a near or mid-term priority of the airport which would negate any line of site issues based on the potential sites studied to date.

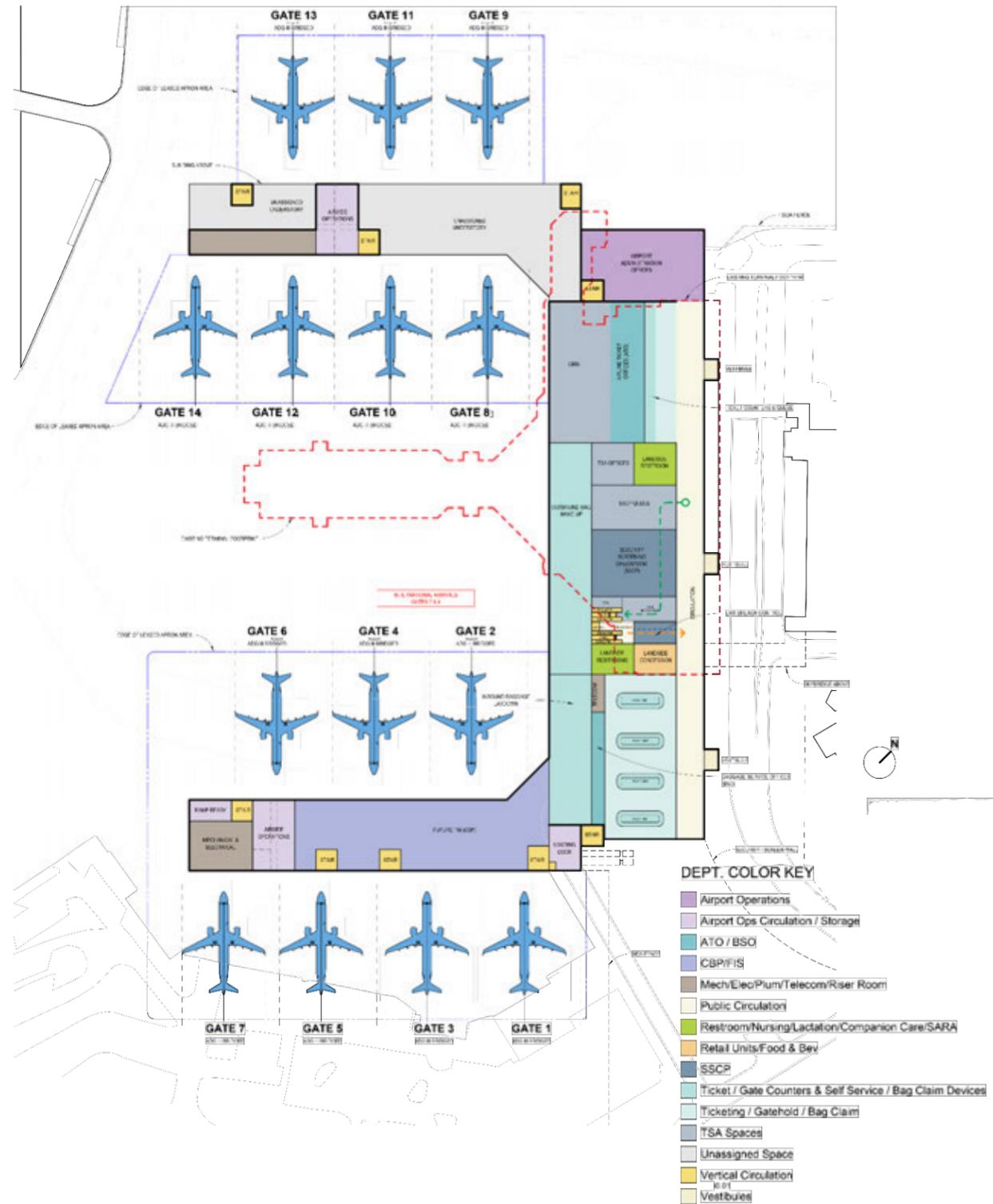
Exhibit 4.1-18, Concept 1 Refined, presents a refined layout of Concept 1 that includes many of the associated improvements to the landside facilities as well as the relocated facilities of Tex Sutton, and Delta Air Cargo (GSE Maintenance) that are required enabling projects for all terminal redevelopment concepts. **Exhibit 4.1-19 & Exhibit 4.1-20**, present the interior block level floor plans of Concept 1 for both the first and second levels respectively.

Exhibit 4.1-18 – Concept 1 Refined



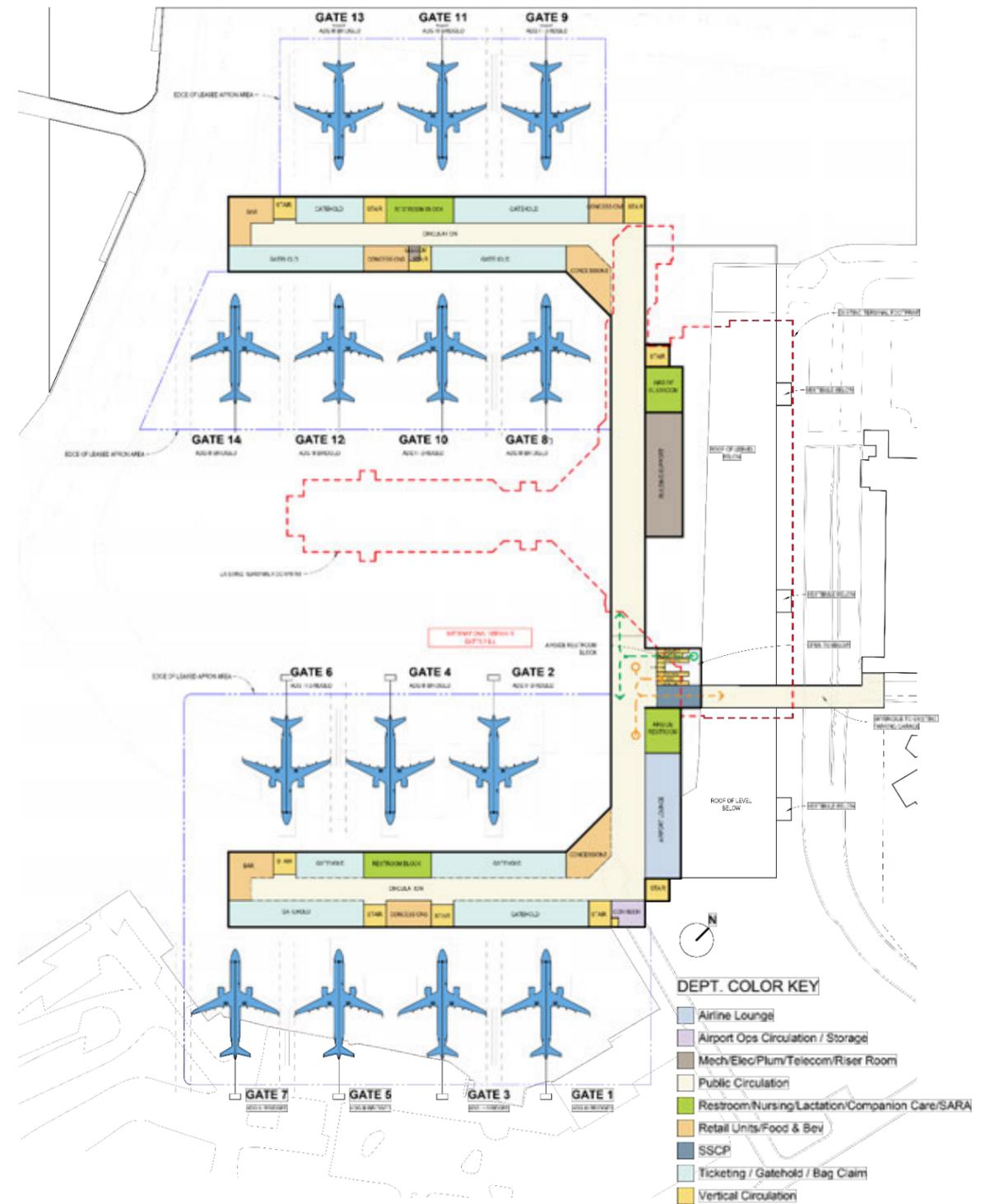
Source: CMT, Alliance, WSP

Exhibit 4.1-19 – Concept 1 Block Level Floor Plans (First Floor)



Source: Alliance

Exhibit 4.1-20 – Concept 1 Block Level Floor Plans (Second Floor)



Source: Alliance

Concept 4

Concept 4 was developed in direct response to the tower line of site issues presented in Concept 1. In lieu of a second concourse forming a 'u-shaped' building, the concourse transitions from a double loaded concourse to a single loaded concourse that continues along the back of the terminal headhouse. The single loaded concourse is angled slightly to improve line of site visibility from the ATCT.

The single-loaded concourse offers additional advantages. One advantage is that there is no need for a dual parallel taxiway between two parallel concourses. This allows the concourse to be shifted north to eliminate impact on Airport Road to the apron expansion requirements. The siting of the terminal headhouse and concourse does allow for a dual parallel taxiway along the new concourse. An added benefit of the concourse alignment is the additional apron space created south of the concourse. With a modest apron expansion four remain-over-night (RON) and/or deicing positions can be developed to provide additional flexibility for the airport.

In Concept 4, the new two-story terminal headhouse includes program areas and processing functions on both levels. Level One includes airline ticketing and check-in, outbound baggage screening, inbound baggage and baggage claim. Level Two includes the security screening checkpoint and airport administration offices. To facilitate construction with a minimal impact on airport operations, the terminal headhouse is built outside the existing building's footprint. This would allow the new terminal headhouse building to be constructed and all processing functions moved to the new building once complete.

The concourses include programmatic functional area on each of two levels. A majority of the Level One program areas are operational support space for airline tenants and/or building support space such as mechanical and electrical rooms or understory spaces reserved for future expansion of the terminal. Level Two program areas include gate holdroom seating areas, restrooms and passenger amenities as well as commercial program spaces.

Like Concept 1, the lower level of the concourse preserves space on Level One for a future FIS area. A detailed layout was not developed as part of the terminal area plan, however the area identified is sized to meet the program requirements of an FIS capable of processing 400 passengers per hour. Roughly the equivalent of two narrowbody aircraft arriving around the same time. A sterile corridor at the concourse level and vertical circulation from the concourse level down to the FIS need to be provided if the FIS is constructed in the future.

Exhibit 4.1-21, Concept 4 Refined, presents a refined layout of Concept 4 that includes many of the associated improvements to the landside facilities as well as the relocated facilities of Tex Sutton, and Delta Air Cargo (GSE Maintenance) that are required enabling projects for all terminal redevelopment concepts. **Exhibit 4.1-22 & Exhibit 4.1-23**, present the interior block level floor plans of Concept 4 for both the first and second levels respectively.

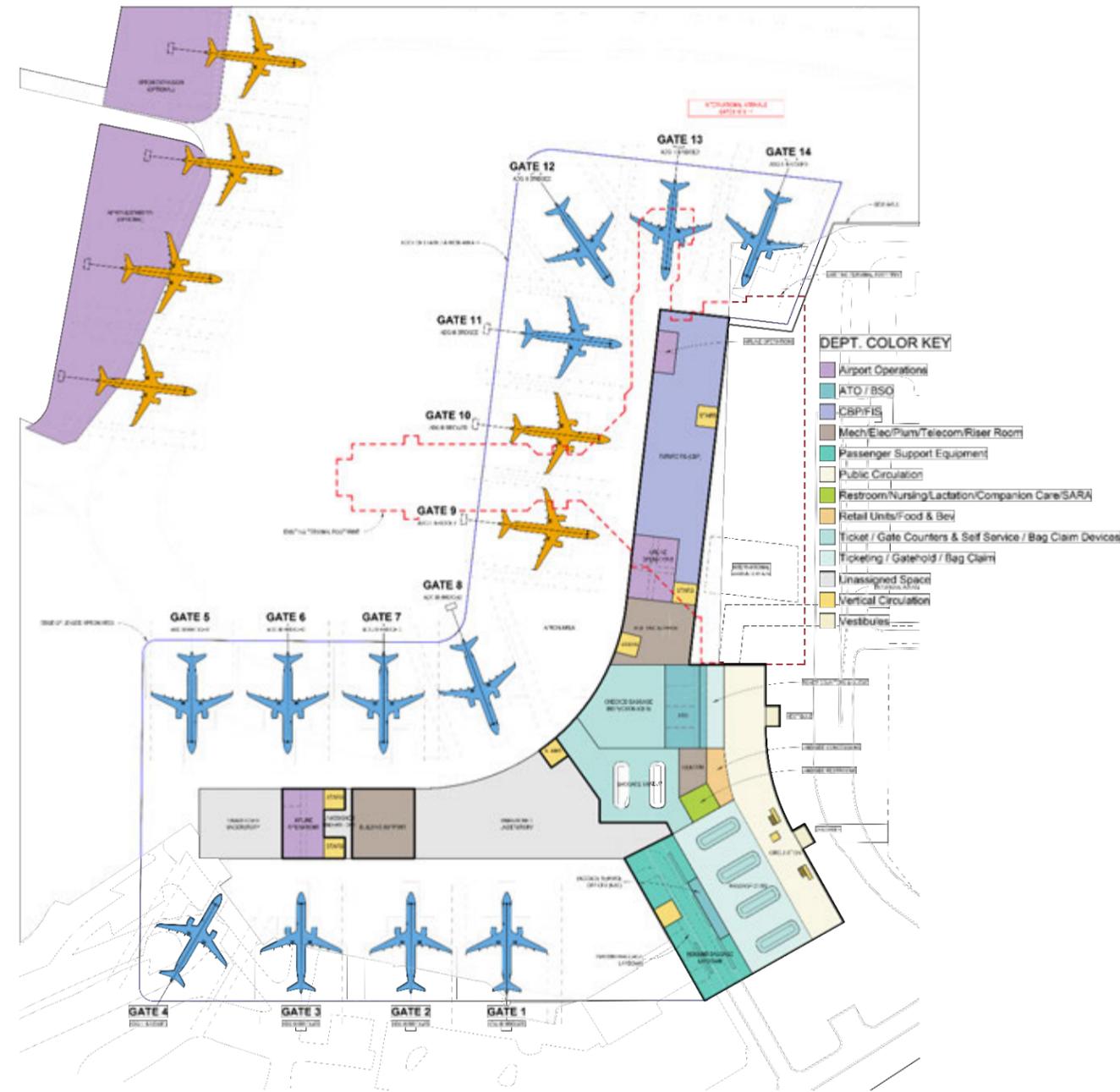


Exhibit 4.1-21 – Concept 4 Refined



Source: CMT, Alliance, WSP

Exhibit 4.1-22 – Concept 4 Block Level Floor Plans (First Floor)



Source: Alliance

Exhibit 4.1-23 – Concept 4 Block Level Floor Plans (Second Floor)



Source: Alliance

Hybrid Concept

The Hybrid Concept blends the terminal headhouse location of Concept 1 and the concourse location and configuration from Concept 4. Like Concept 1, the terminal headhouse is sited and oriented similar to the existing building. It does however shift to the airside to increase the distance between the terminal building and existing parking garage. To facilitate the phased terminal replacement, the initial building expansion would occur outside of the existing building footprint to minimize disruptions to existing operations. This would bias the terminal headhouse to the south. The terminal headhouse includes all major programmatic and functional spaces on a single level while the structure itself is a two-story volume. Passengers arriving at the airport for a flight enter the building on Level One and ascend to Level Two after processing through the security screening checkpoint.

The approach to the concourse is similar to Concept 4 with the slight variation in alignment. Since the terminal headhouse is longer, the single loaded concourse is perpendicular to the double loaded portion of the concourse expansion in lieu of the slight angle in Concept 4.

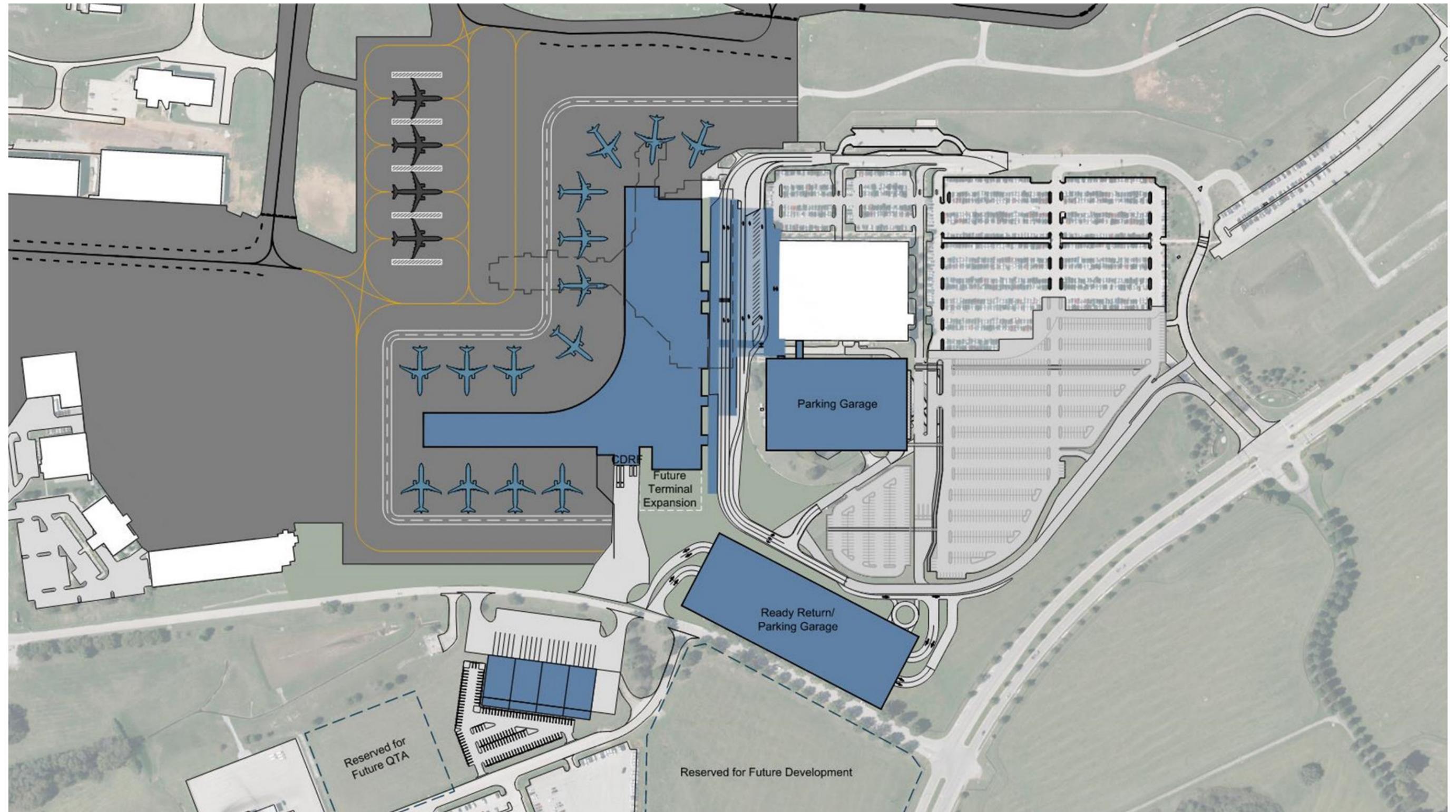
The concourses include programmatic functional area on each of two levels. A majority of the Level One program areas are operational support space for airline tenants and/or building support space such as mechanical and electrical rooms or understory spaces reserved for future expansion of the terminal. Level Two program areas include gate holdroom seating areas, restrooms and passenger amenities as well as commercial program spaces.

It was noted that although at this stage all primary processing functions of the terminal headhouse are on a single level like Concept 1, there is the ability to add a second level in the terminal headhouse to allow processing and programmatic functions on two levels. This would have the benefit of allowing the overall length of the terminal headhouse to be reduced preserving space for future expansion of the headhouse.

Exhibit 4.1-24, Hybrid Concept, presents the layout of the Hybrid Concept that includes many of the associated improvements to the landside facilities as well as the relocated facilities of Tex Sutton, and Delta Air Cargo (GSE Maintenance) that are required enabling projects for all terminal redevelopment concepts. **Exhibit 4.1-25 & Exhibit 4.1-26**, present the interior block level floor plans of the Hybrid Concept for both the first and second levels respectively. Due to the advantages provided by the Hybrid Concept over Concept 1—specifically increased apron area efficiency, mitigation of potential impacts on Airport Road, and the absence of line-of-sight issues from the existing ATCT while preserving the incrementality of Concept 1—the Hybrid Concept was carried forward for further analysis in place of Concept 1. This continued assessment pertains to landside facilities, utilities, stormwater management, and phasing or implementation considerations.

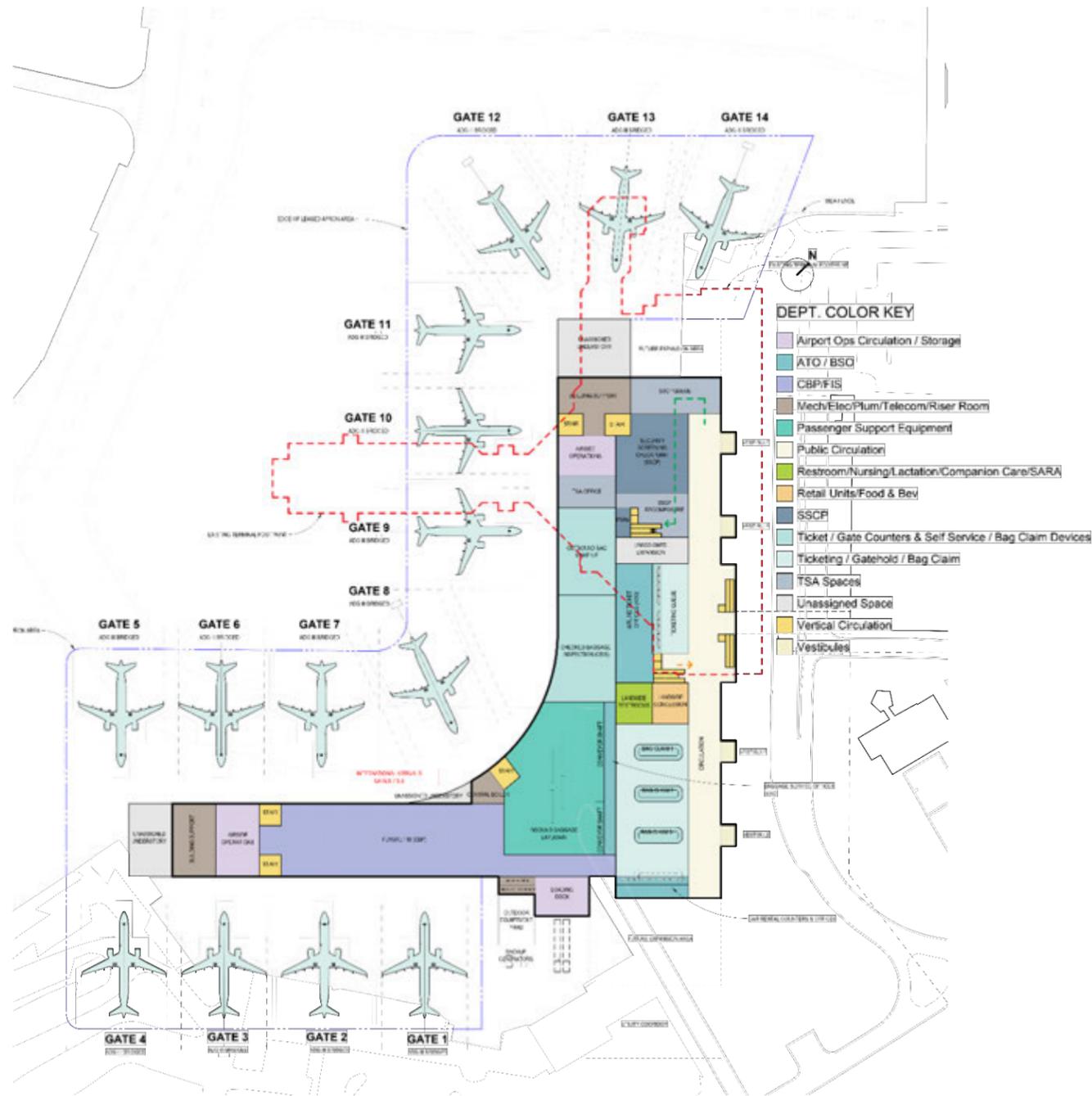


Exhibit 4.1-24 – Hybrid Concept



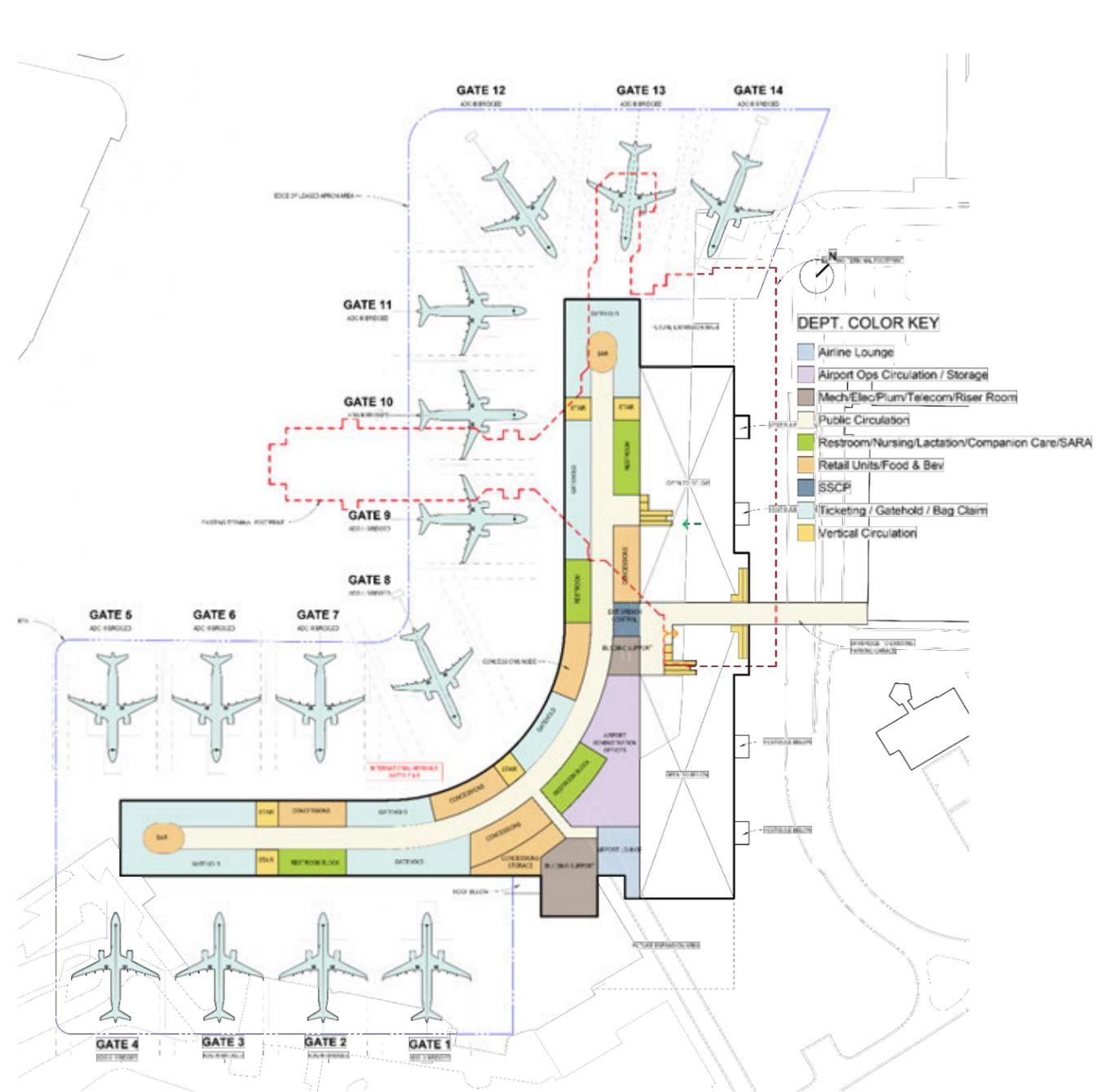
Source: CMT, Alliance, WSP

Exhibit 4.1-25 – Hybrid Concept Block Level Floor Plans (First Floor)



Source: Alliance

Exhibit 4.1-26 – Hybrid Concept Block Level Floor Plans (Second Floor)



Source: Alliance

4.2 Landside Facilities

4.2.1 Terminal Curbfront

Concept 4

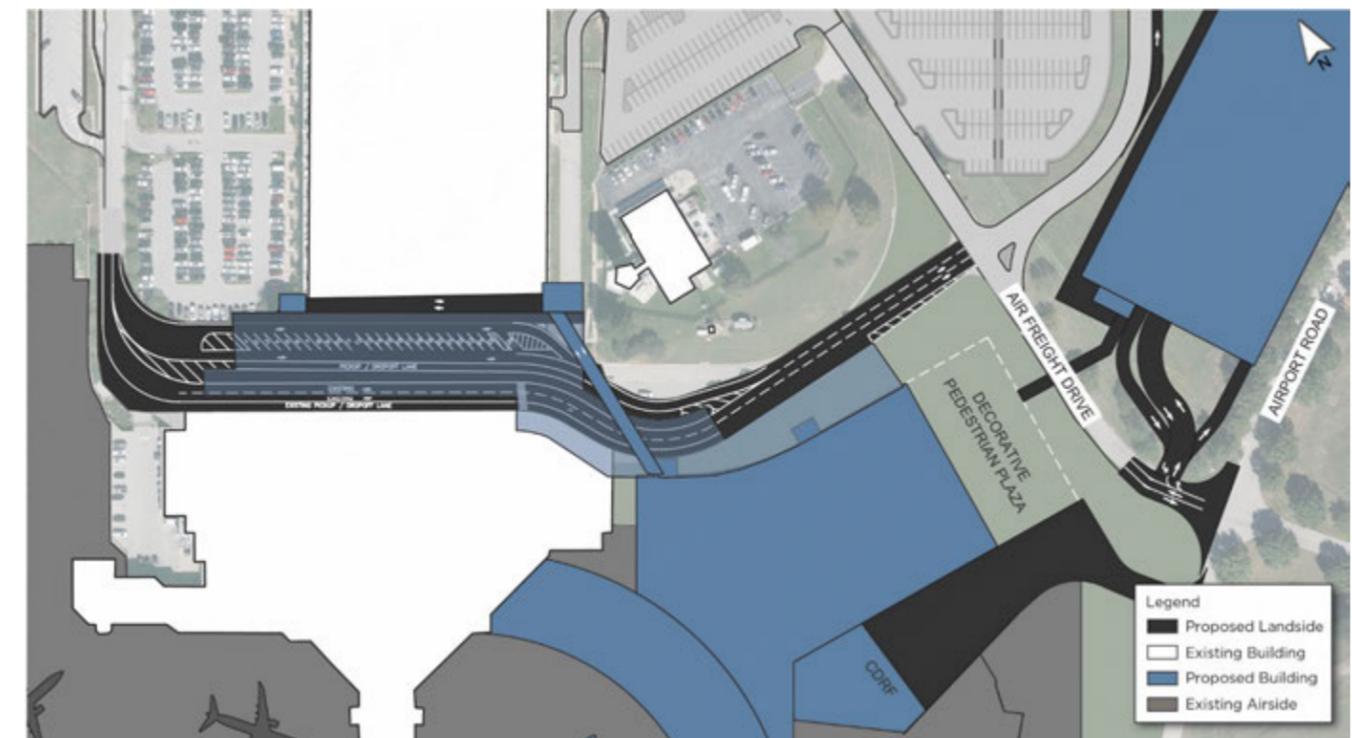
Phase III

The landside complex recommendations for Concept 4 through Phase III include the following changes/improvements:

- The curve of Terminal Drive leading into the terminal curbside increased to a 125-foot radius
- The curbside area adjacent to the existing terminal headhouse:
 - Total usable curb length = 890' (existing curb 490' + 400' proposed curb)
 - Two dedicated 12' wide through lanes
 - 20' wide raised median adds a safe haven for pedestrians
 - 625' of raised median curb for loading/unloading
 - Adjacent dedicated GTC
 - The proposed curb length is 890' by adding 490' to the 400' of the existing with two through lanes, a 20' median with 625' of curb for drop off with one through lane adjacent to the GTC area
- Realignment of Terminal Drive after passing the existing Terminal Headhouse to align with the façade of the new Terminal Headhouse and an associated extension of the curbside
- Narrowing Terminal Drive to two lanes prior to the Air Freight Drive Intersection
- Elevated crosswalk from the new terminal headhouse to the existing public parking garage to limit the number of at-grade pedestrian crossings

Exhibit 4.2-1, Concept 4 Landside Configuration (Phase III), depicts these proposed improvements to the terminal landside complex. **Exhibit 4.2-2, Concept 4 Curbside Cross Section (Phase III)**, presents the cross section of lanes and curbs planned for Terminal Curbside Phase III assuming the development of Concept 4.

Exhibit 4.2-1 – Concept 4 Landside Configuration (Phase III)



Source: WSP, CMT

Exhibit 4.2-2 – Concept 4 Curbside Cross Section (Phase III)



Source: WSP

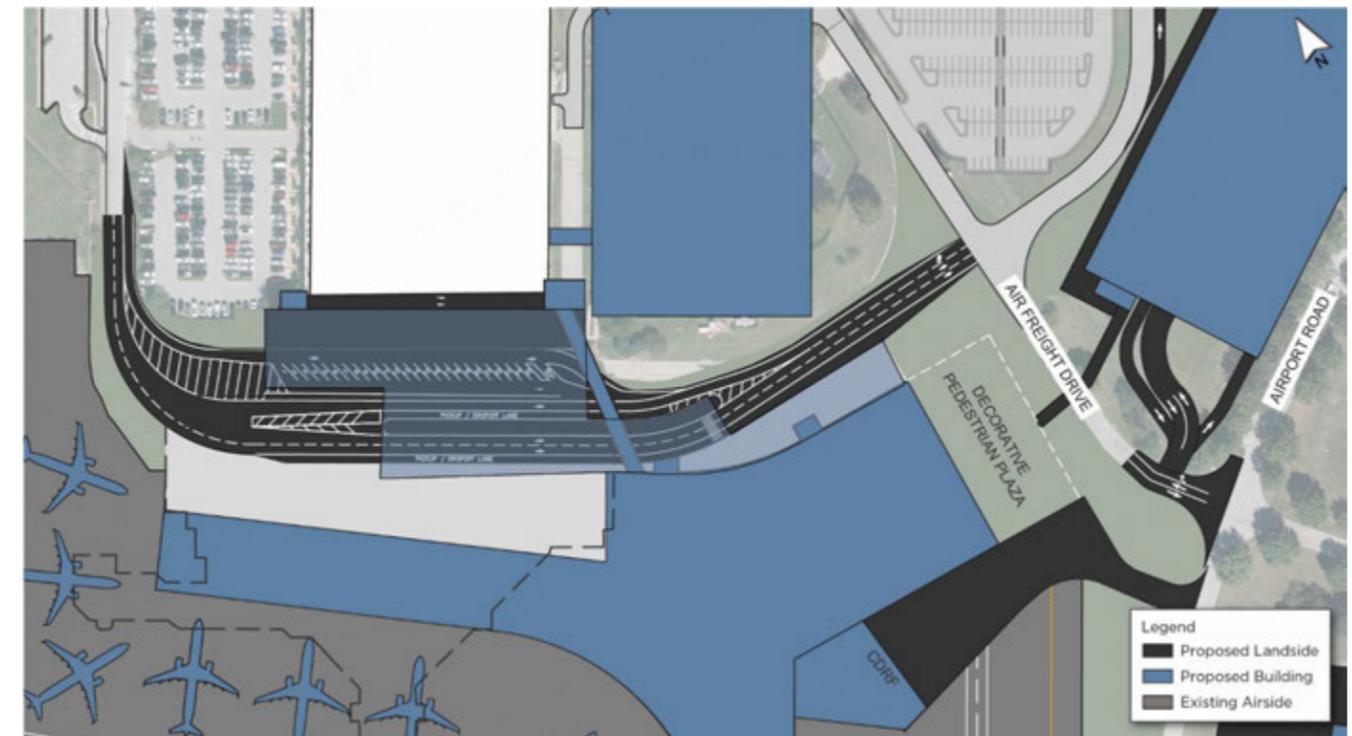
Full Build-Out

The landside complex recommendations for Concept 4 through the full build-out of the program include the following changes/improvements in addition to those listed under the Phase III program:

- A third through-lane added to improve the traffic flows to the GTC.
- The terminal curbside has been extended further along the expanded terminal headhouse over the site of the existing curbside
 - Total usable curb length = 800'
 - Three dedicated 12' wide through lanes
 - 20' wide raised median adds a safe haven for pedestrians
 - 550' of raised median curb for loading/unloading
 - Adjacent dedicated GTC
- Increased curbside depth between the terminal headhouse façade and the pick-up/drop-off lane

Exhibit 4.2-3, Concept 4 Landside Configuration (Full Build-Out), depicts these proposed improvements to the terminal landside complex. **Exhibit 4.2-4, Concept 4 Curbside Cross Section (Full Build-Out)**, presents the cross section of lanes and curbs planned for the Terminal Curbside in the Full Build Out configuration for Concept 4.

Exhibit 4.2-3 – Concept 4 Landside Configuration (Full Build-Out)



Source: WSP, CMT

Exhibit 4.2-4 – Concept 4 Curbside Cross Section (Full Build-Out)



Source: WSP

Hybrid Concept

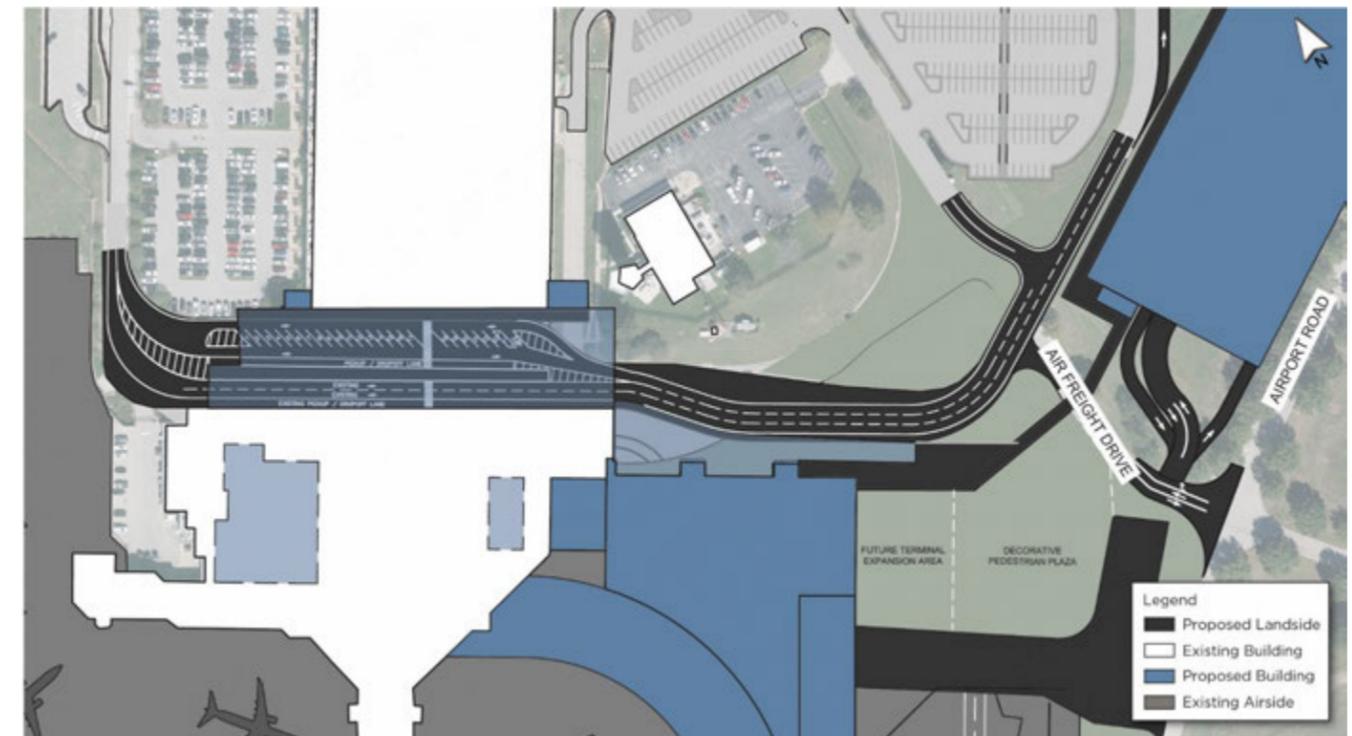
Phase III

The landside complex recommendations for the Hybrid Concept through Phase III include the following changes/improvements:

- The curve of Terminal Drive leading into the terminal curbside increased to a 125-foot radius.
- The curbside area adjacent to the existing terminal headhouse:
 - Total usable curb length = 895 (existing curb 520' + 375' proposed curb)
 - Two dedicated 12' wide through lanes
 - 20' wide raised median adds a safe haven for pedestrians
 - 410' of raised median curb for loading/unloading
 - Adjacent dedicated Ground Transportation Center (GTC)
- Narrowing Terminal Drive to two lanes at Air Freight Drive.
- Shifting the intersection with Air Freight Drive to the east.
- Providing the Rental Ready Service (non-public) entrance and exit from Air Freight Drive along with an auxiliary lane for a public entrance to the facility
- Additional at-grade public entrance to the Rental Ready Facility from Airport Road

Exhibit 4.2-5, Hybrid Concept Landside Configuration (Phase III), depicts these proposed improvements to the terminal landside complex. **Exhibit 4.2-6, Hybrid Concept Curbside Cross Section (Phase III)**, presents the cross section of lanes and curbs planned for Terminal Curbside Phase III assuming the development of the Hybrid Concept.

Exhibit 4.2-5 – Hybrid Concept Landside Configuration (Phase III)



Source: WSP, CMT

Exhibit 4.2-6 – Hybrid Concept Curbside Cross Section (Phase III)



Source: WSP

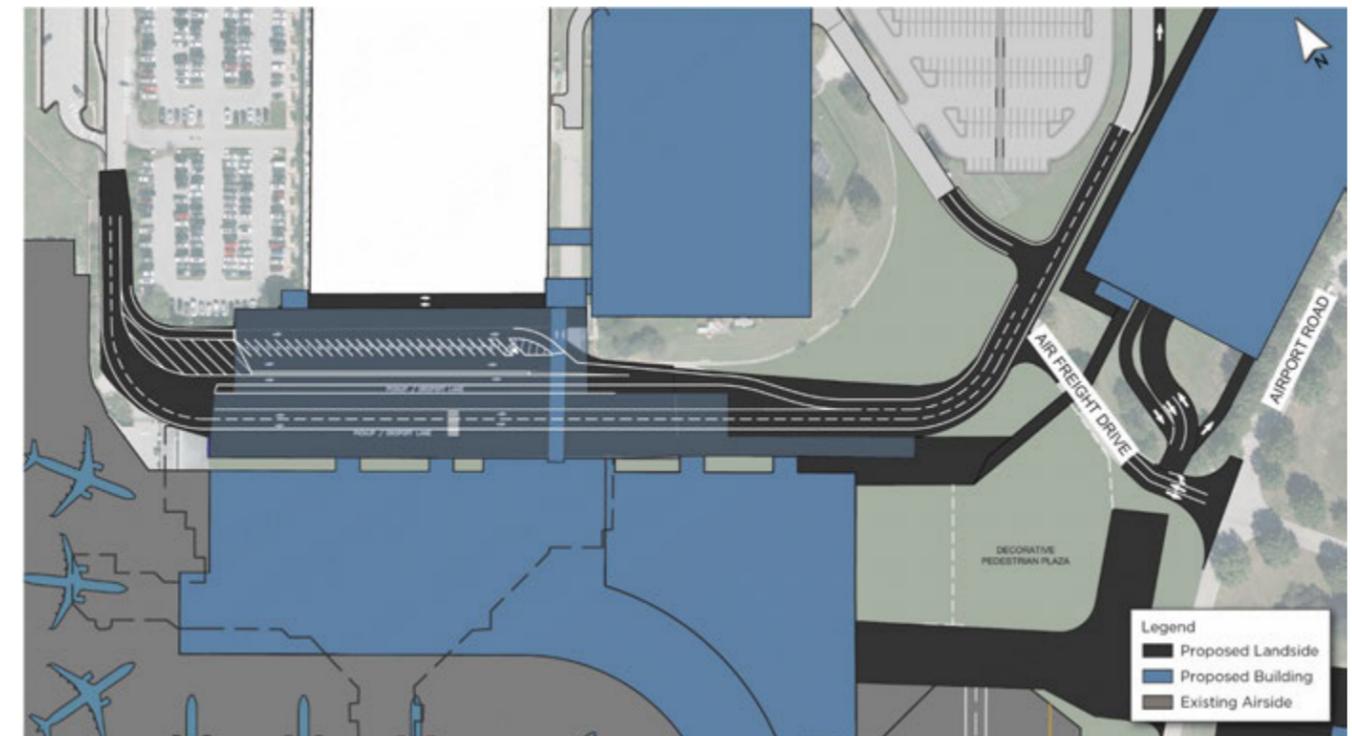
Full Build-Out

The landside complex recommendations for the Hybrid Concept through the full build-out of the program include the following changes/improvements in addition to those listed under the Phase III program:

- A third through-lane added to improve the traffic flows to the GTC
- The terminal curbside has been extended
 - Total usable curb length = 875'
 - Three dedicated 12' wide through lanes
 - 20' wide raised median adds a safe haven for pedestrians
 - 625' of raised median curb for loading/unloading
 - Adjacent dedicated GTC area
- Increased curbside depth between the terminal headhouse façade and the pick-up/drop-off lane.
- Elevated crosswalk from the terminal headhouse to the public parking garage to limit the number of at-grade pedestrian crossings.

Exhibit 4.2-7, Hybrid Concept Landside Configuration (Full Build-Out), depicts these proposed improvements to the terminal landside complex. **Exhibit 4.2-8, Hybrid Concept Curbside Cross Section (Full Build-Out)**, presents the cross section of lanes and curbs planned for the Terminal Curbside in the Full Build Out configuration for the Hybrid Concept.

Exhibit 4.2-7 – Hybrid Concept Landside Configuration (Full Build-Out)



Source: WSP, CMT

Exhibit 4.2-8 – Hybrid Concept Curbside Cross Section (Full Build-Out)



Source: WSP

Wayfinding

To improve access and reinforce identity, add a Wayfinding package should be included in the landside program associated with either Concept 4 or the Hybrid Concept. This should extend to the branding of Entry Way monuments and include signage and pavement markings on Terminal Drive, the curbside, Airport Road, and Air Freight Drive. This signage and wayfinding program should also compliment and be consistent with the rebranding work that is currently underway by the Airport. **Exhibit 4.2-9 & Exhibit 4.2-10**, provide examples of wayfinding and signage at other airports.

Exhibit 4.2-9 – Example Landside Signage



Source: WSP

Exhibit 4.2-10 – Example Landside Pavement Wayfinding



Source: WSP

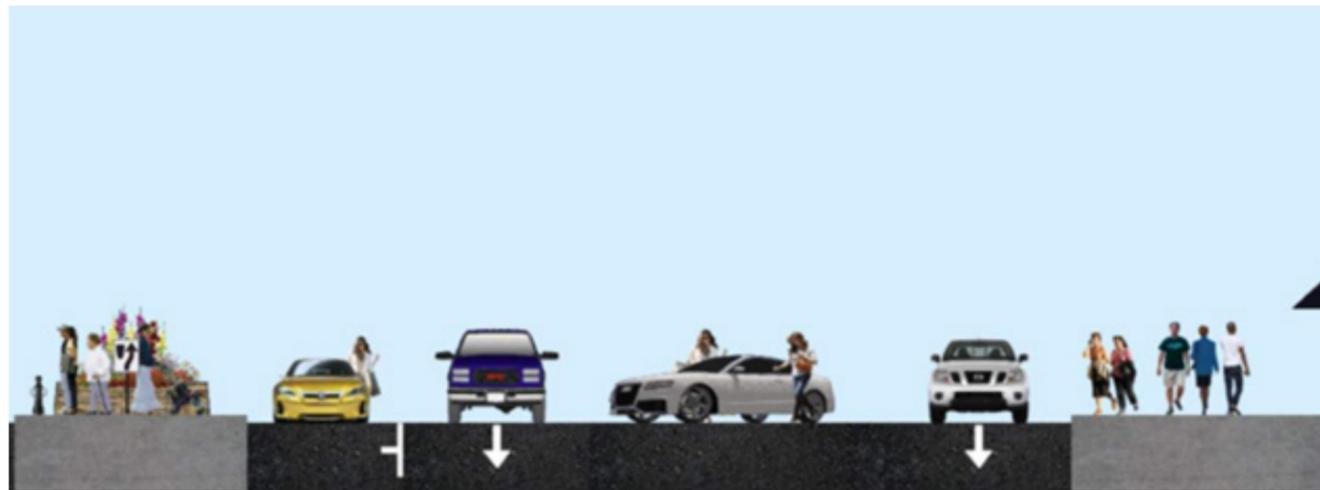
4.2.2 Ground Transportation Center

Assuming the development of Concept 4 or the Hybrid Concept, the optimal location for a new GTC is on the southern façade of the existing short-term parking garage. Some cross-sectional changes do occur between the Phase III Build Out and Full Build Out for both concept's GTC. **Exhibit 4.2-11, GTC Cross Section (Phase III)**, presents the cross section of lanes and curbs planned for the GTC through Phase III assuming the development of Concept 4. **Exhibit 4.2-12, GTC Plan (Phase III)**, presents the GTC plan for Concept 4 through Phase III. The key elements through Phase III are:

Phase III

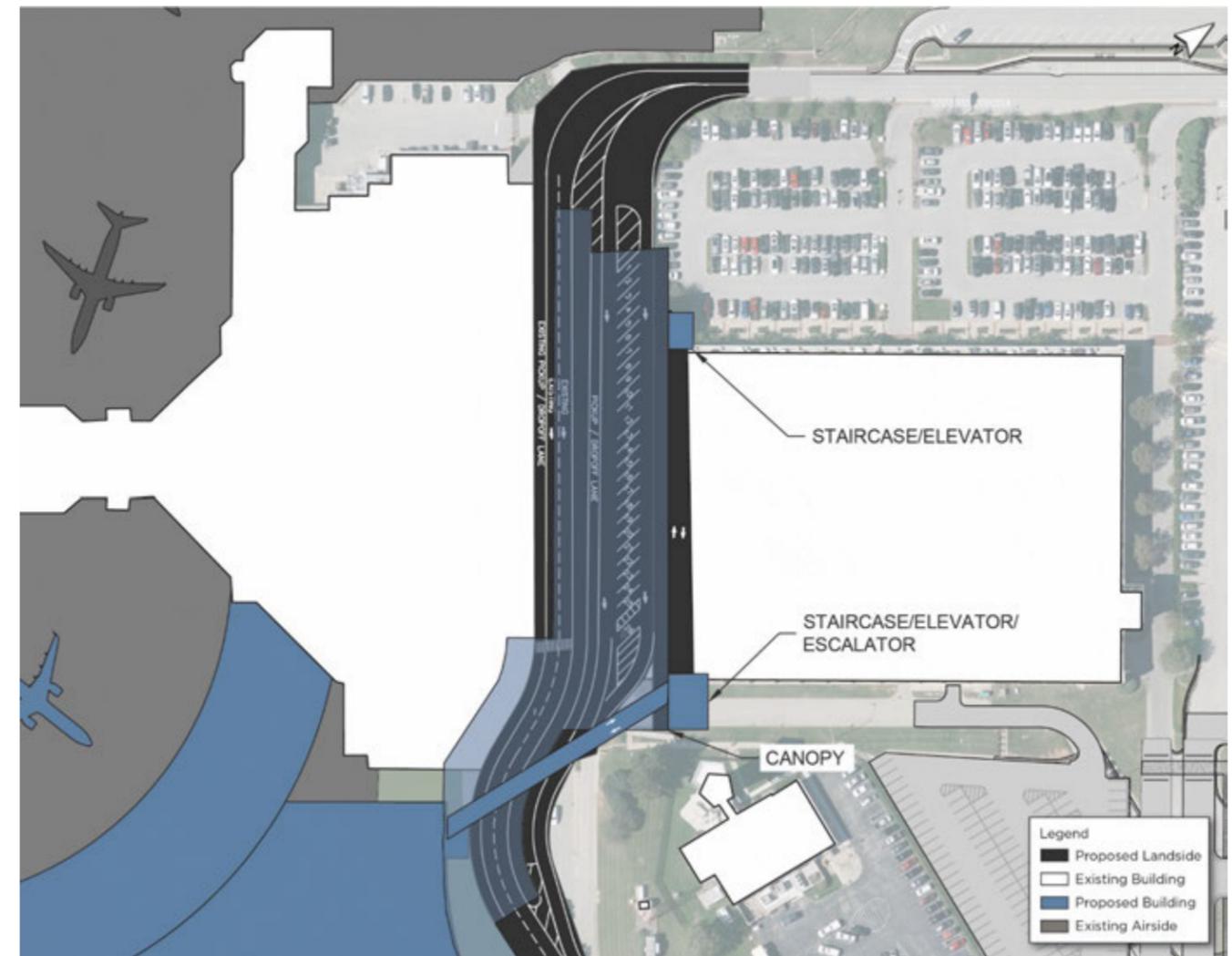
- 26 (24 in Hybrid) Drive-through GTC (TNC, Limousine or Hotel Shuttle) Spaces including 1 ADA accessible space
- GTC includes 30' (17' in Hybrid) wide sidewalk and two (2) 12' wide through lanes of traffic
- Parking Deck stair tower modernization and relocation to East/West sides of Parking Deck
 - Stair towers will include escalators and elevators
- Enclosed moving walkway installed between stair towers providing both safety and efficiencies for passengers
- Additional width of GTC sidewalk is covered by canopy
- Skywalk between East Parking Deck Stair Tower and Terminal Headhouse is constructed

Exhibit 4.2-11 – GTC Cross Section (Phase III)



Source: WSP

Exhibit 4.2-12 – GTC Plan (Phase III)



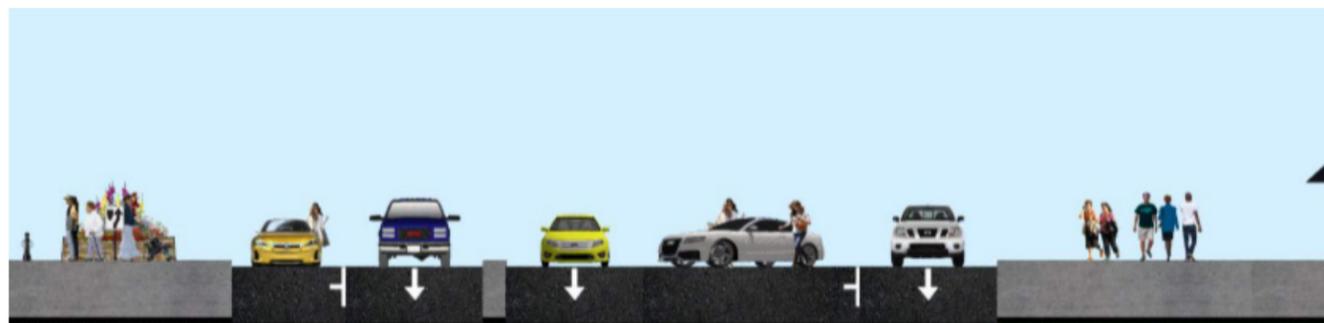
Source: WSP, CMT

Full Build-Out

- 26 Drive-through GTC (TNC, Limousine or Hotel Shuttle) Spaces including one ADA accessible space
- Terminal curbfront and loading and through lane south of GTC are reconstructed. A curb is installed between outside GTC through lane and the roadway through and loading lanes.
- Skywalk between East Parking Deck Stair Tower and Terminal constructed

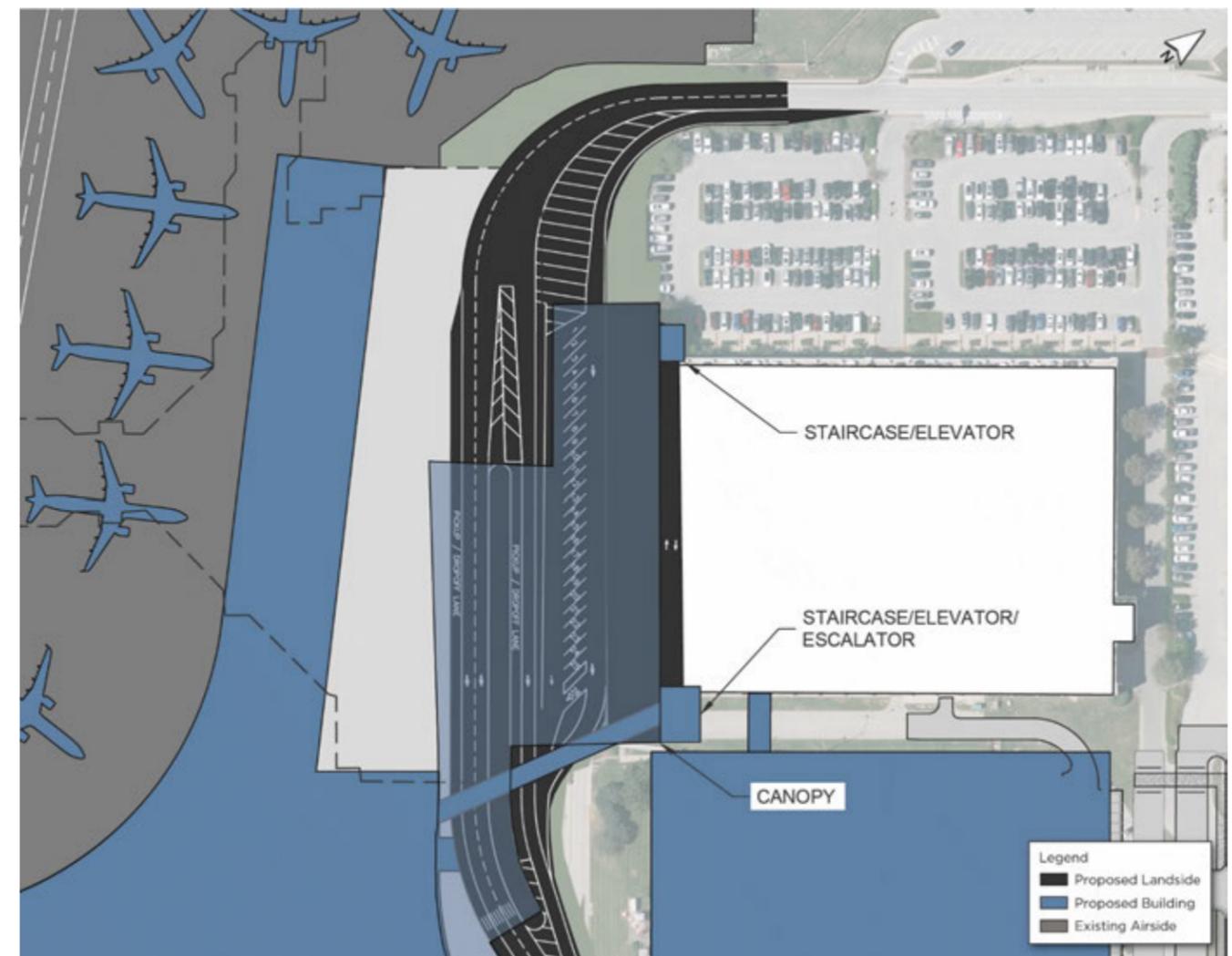
Exhibit 4.2-13, Concept 4 GTC Cross Section (Full Build-Out), presents the cross section of lanes and curbs planned for the GTC in the Full Build Out configuration for Concept 4. **Exhibit 4.2-14, Concept 4 GTC Plan (Full Build Out)**, presents the GTC plan for Concept 4 in the Full Build Out configuration.

Exhibit 4.2-13 – Concept 4 GTC Cross Section (Full Build-Out)



Source: WSP

Exhibit 4.2-14 – Concept 4 GTC Plan (Full Build-Out)



Source: WSP, CMT

4.2.3 Rental Car Ready Return

Based upon the results of Rental Car Ready Return demand presented in Section 3.2.5, the TAP developed a series of conceptual alternatives aimed at maximizing the amount of parking that could be accomplished within the terminal area campus. Based on the site constraints including setback, utility corridors, and existing roadway networks including maintaining Air Freight Dr. as a secondary emergency route off airport. It was determined that the largest Ready Return facility that can be accommodated is 600 feet by 240 feet or a 144,000 square-foot footprint. Assuming that footprint size and two levels, **Table 4.2-1, Proposed Ready Return Parking Facility by Brand Family**, presents the anticipated number of ready return parking spaces that can be accommodated based by brand family. It should be noted that the programmatic requirements for the Rental Car Ready Return facility are the same whether developed under a program for Concept 4 or the Hybrid Concept. The only material difference under each is the exact location of the facility relative to the terminal building. Even then, the constraints of the site (Terminal Drive, Air Freight Drive, Airport Road, and Man O' War Boulevard do not offer much flexibility in the placement of the facility and associated entrances, exits, and ramps.

Table 4.2-1 – Proposed Ready Return Parking Facility by Brand Family

Brand Family	Level	Ready Spaces	Return Spaces	Total Spaces
Enterprise	1	220	160	380
Hertz & Avis	2	220	160	380
			TOTAL	760

Notes: 1. Ready Spaces = 420 SF/space
 2. Return Spaces = 300 SF/space
 Source: WSP

Concept 4

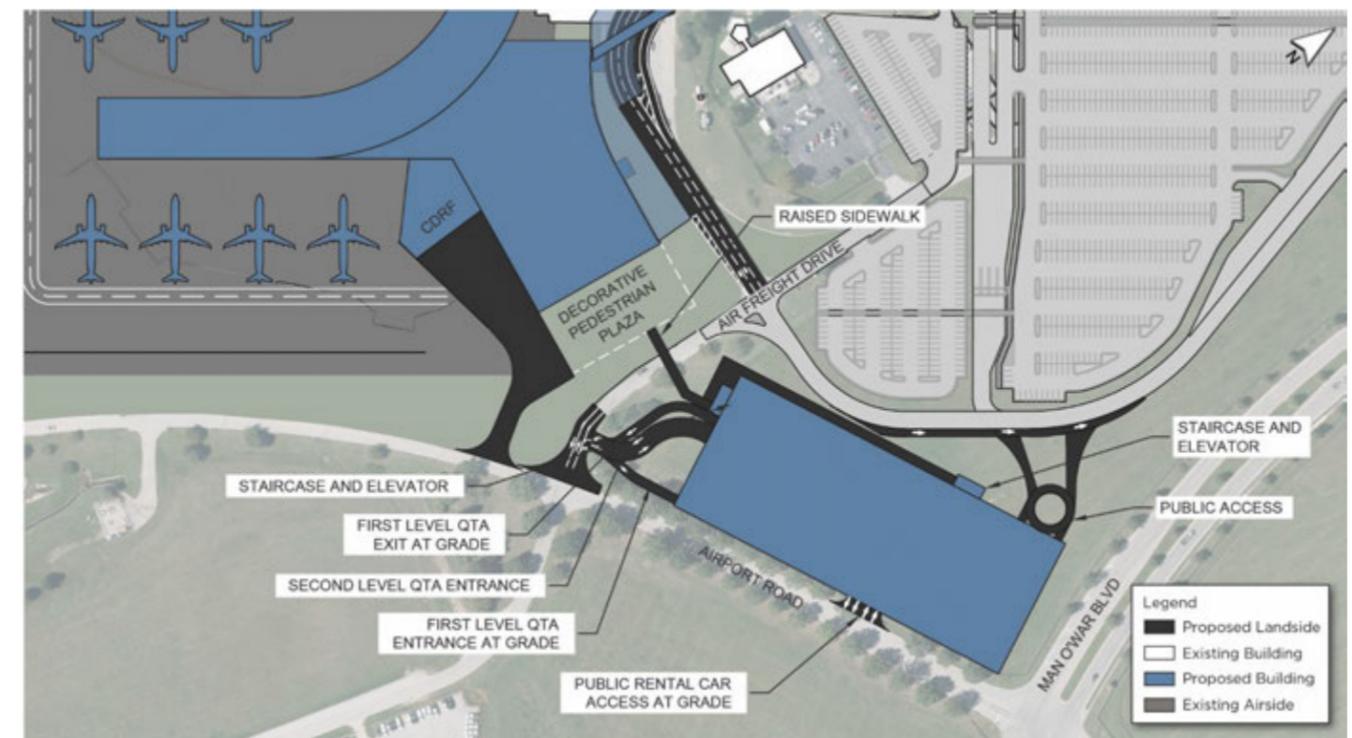
The Ready Return Facility under Concept 4 provides the following key elements:

- 144,000 square-foot footprint with the first level on grade
- Public access via a helical ramp from Terminal Drive or Airport Road
- Rental Car QTA access to levels 1 & 2 from Airport Road and Air Freight Drive
- Two (2) Stair towers with elevator and stair access
- Covered raised sidewalk and access to a decorative pedestrian plaza and terminal head house with a reduced travel path due to the terminal's proximity

Phase III

The Concept 4 Ready Return Facility through Phase III provides two supported levels; the first on-grade with a second level of covered parking above providing two fully covered levels of parking. Through the provision of the second covered level, there is potential to accommodate public or employee parking on the second or additional supported levels in order to provide capacity to meet the overall vehicle parking demand without having to construct additional surface lots or parking structures. **Exhibit 4.2-15, Concept 4 Rental Ready Facility (Phase III)**, presents the planned layout of the proposed Rental Ready Facility through Phase III.

Exhibit 4.2-15 – Concept 4 Rental Ready Facility (Phase III)



Source: WSP, CMT

Full Build-Out

At full build-out, Concept 4 has three additional supported levels of parking would be constructed on top of the proposed Rental Ready Facility to accommodate additional public parking demand. These additional levels of the facility require that the existing ATCT have been relocated as the additional height of the structure would present line-of-sight issues for the controllers.

The public will access the upper levels via the helical ramp on the northeastern corner of the parking deck. No changes to the footprint nor access will be made during this additional build. It is important to note that while the garage is planned for future expansion to accommodate future public parking demands, the ready return operations will need to be relocated to facilitate the construction safely. This should be taken into consideration when planning for future public parking needs.

Hybrid Concept

Similar to Ready Return Facility proposed with Concept 4, the Ready Return Facility proposed with the Hybrid Concept is planned to be constructed at grade with the following key elements:

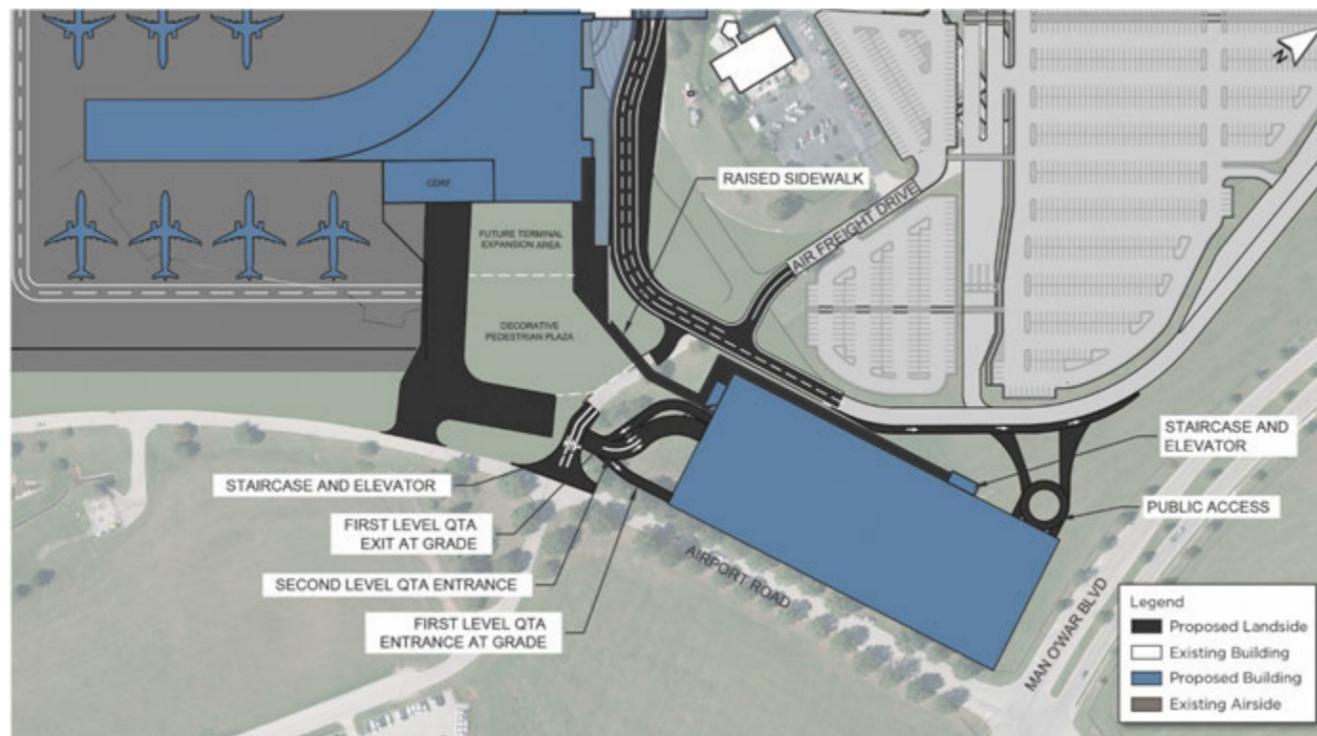
- 144,000 square foot footprint
- Public access via a helical ramp from terminal drive or Airport Road
- Rental Car QTA access to levels 1&2 from Airport Road
- Two (2) Stair towers with elevator and stair access
- Covered raised sidewalk and access to a decorative pedestrian plaza and terminal head house

The only substantive difference between the Ready Return Facility proposed in the Hybrid Concept and that proposed in Concept 4 is the exact location relative to the proposed terminal facilities.

Phase III

The Ready Return Facility through Phase III will have two supported levels and one level on-grade. This will allow for two covered levels of ready return parking and operational space. Due to the second supported level being constructed as a covered roof, the Airport could consider utilizing it as uncovered parking for either public or employees. **Exhibit 4.2-16, Hybrid Concept Rental Ready Facility (Phase III)**, presents the planned layout of the proposed Rental Ready Facility through Phase III of the Hybrid Concept implementation.

Exhibit 4.2-16 – Hybrid Concept Rental Ready Facility (Phase III)



Source: WSP

4.2.4 Consolidated Receiving and Distribution Facility

Consolidated Receiving and Distribution Facilities (CRDFs) are a critical component of modern airport logistics, streamlining the complex flow of goods, supplies, and materials. By centralizing the receiving, screening, and distribution food, merchandise, and other terminal supplies, CRDFs enhance both operational efficiency and airport security. Instead of vendors and suppliers making individual deliveries to various terminal tenants, all goods are directed to a single, secure location. This reduces vehicle traffic on the airside, minimizes potential security vulnerabilities, and optimizes the use of limited space, ultimately leading to significant cost savings and a more organized and predictable supply chain for the entire airport community.

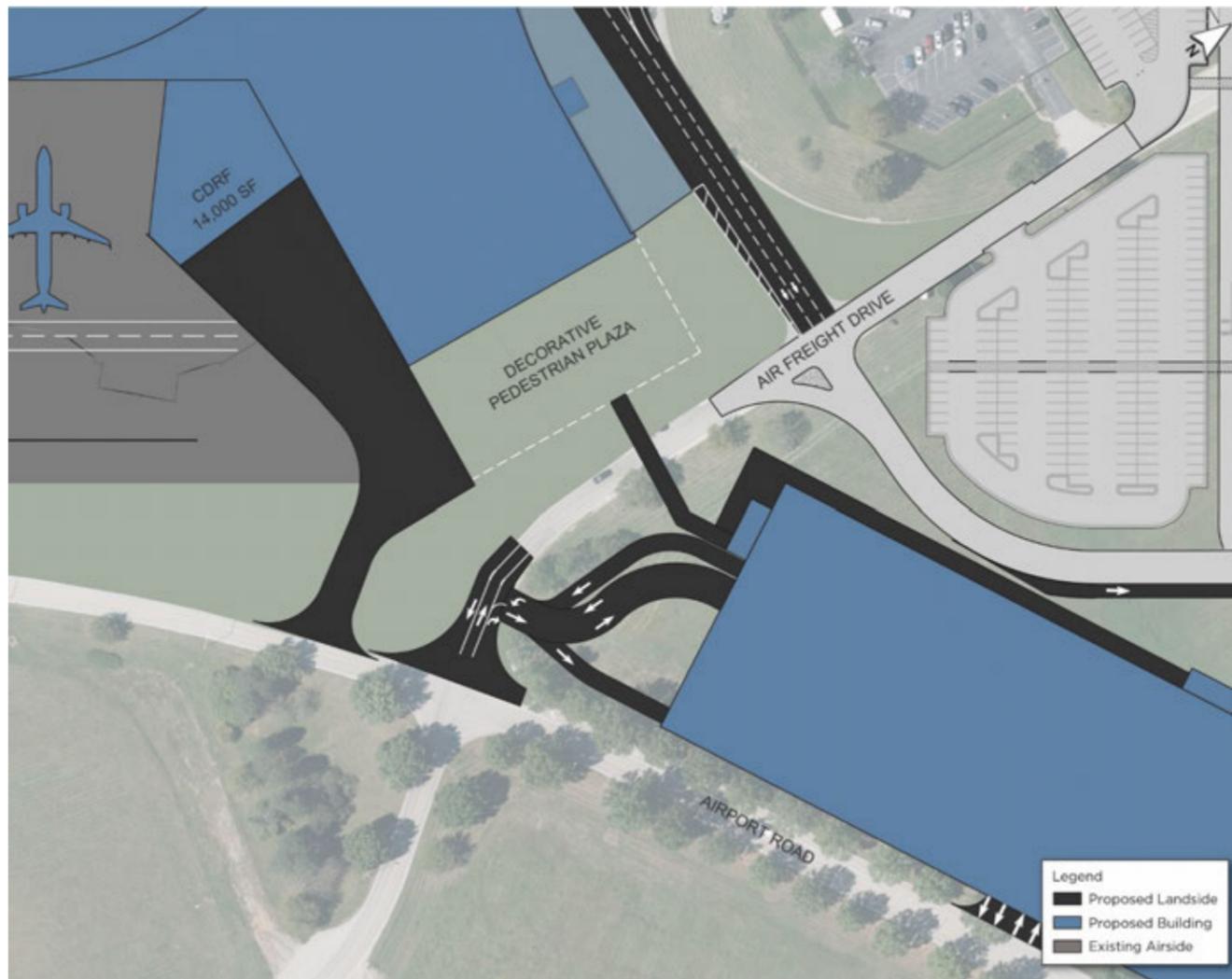
The important functions that a CRDF serves include:

- Non-Secure Receiving Loading Dock
- Non-Secure Receiving Area
- Access Control Secure Scanning Portal
- Secure Warehouse
- Warehouse Staging Area
- Returns Portal
- Secure Distribution Loading Dock
- Secure Cold Storage
- Staff Screening

Currently LEX handles deliveries in a traditional through ad-hoc delivery facilities in the Manager's parking lot on the north end of the existing terminal headhouse. These facilities are not capable of accommodating full-size semi-trucks, nor do they provide truck docking capabilities. All deliveries are forced to use floor jacks and lifts to transport goods and materials into the terminal at grade.

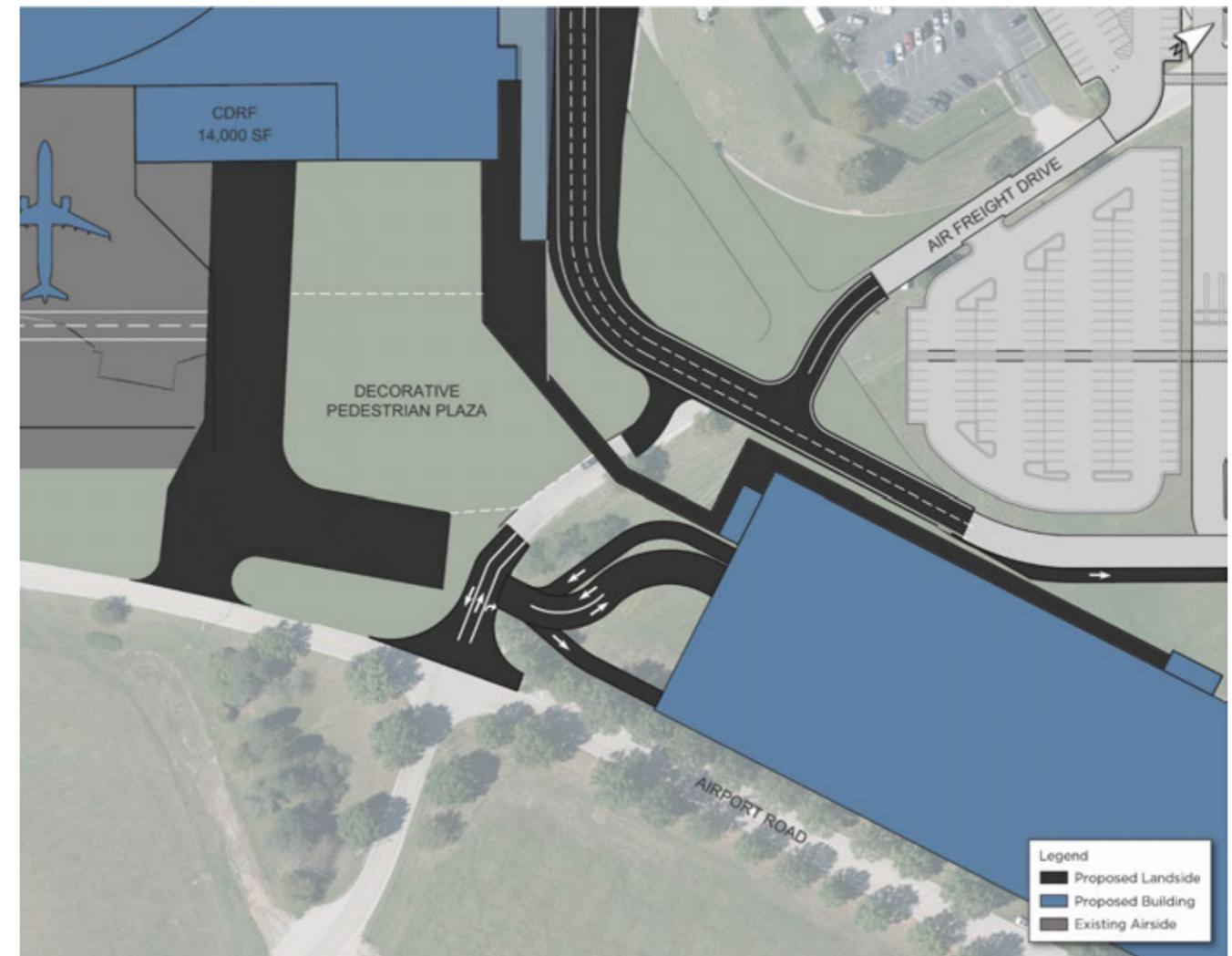
It is recommended that the new terminal facilities be developed with a CRDF accommodating a minimum of two (2) receiving bays adequate for a 53-foot tractor-trailer. This will allow for future growth of enplanements and anticipates the future receiving and distribution requirements necessitated by that growth in enplanements. The minimum footprint suggested for a CRDF at a Small Hub airport is 14,000 square feet. **Exhibit 4.2-17 & Exhibit 4.2-18**, present the recommended layout to accommodate a CRDF of approximately 14,000 square feet. Given the critical role that a CRDF plays at the Airport moving forward, and the central location required, it is recommend that the CRDF be constructed in the earliest phase of development possible.

Exhibit 4.2-17 – Consolidated Receiving and Distribution Facility (Concept 4)



Source: WSP, CMT

Exhibit 4.2-18 – Consolidated Distribution and Receiving Facility (Hybrid Concept)



Source: WSP, CMT

4.3 Utilities

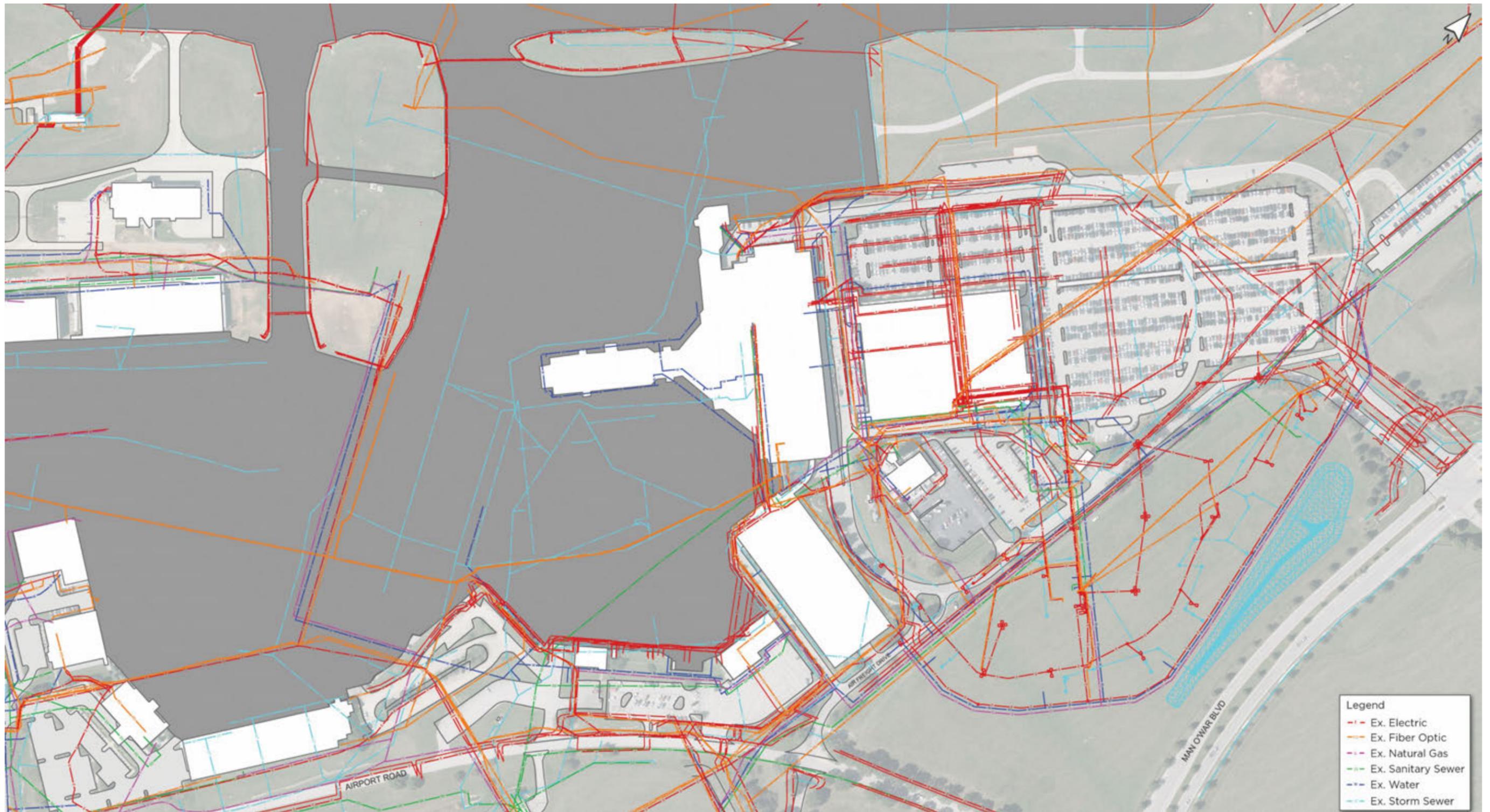
Over time, airports often accumulate a dense and sometimes disorganized network of underground utilities as systems are added, modified, or abandoned. This has been the case at LEX where decades of incremental changes have resulted in a cluttered subsurface environment that poses challenges for new construction, maintenance, and long-term planning.

As part of this study, the TAP team undertook a basic assessment of the existing utility alignments with the goal of untangling the web of existing utilities. This included identifying redundant lines, clarifying routes, and simplifying crossings where feasible, steps that will greatly reduce construction risk, streamline maintenance, and improve safety for future work in the area. In addition, the TAP team developed two variations of a proposed utility corridor, one tailored for each of the terminal concepts under consideration. Each corridor was planned to organize and consolidate the necessary utility relocations for its respective scenario, while also preserving a designated clear space for future terminal expansion. This approach provides flexibility for the airport as building configuration decisions are finalized, while ensuring that either option delivers a structured, maintainable utility layout. It also preserves critical system redundancies so that essential airport operations remain protected throughout construction and into the future.

4.3.1 Existing Conditions

The Airport's current utility network reflects decades of incremental development and service upgrades, resulting in a complex mix of active systems and legacy infrastructure. **Exhibit 4.3-1, Existing Utility Network**, presents a graphical overview of the comprehensive utility network at LEX.

Exhibit 4.3-1 – Existing Utility Network



Notes: Condition assessments were not developed as part of this utility inventory.
Source: WSP, CMT

Electrical

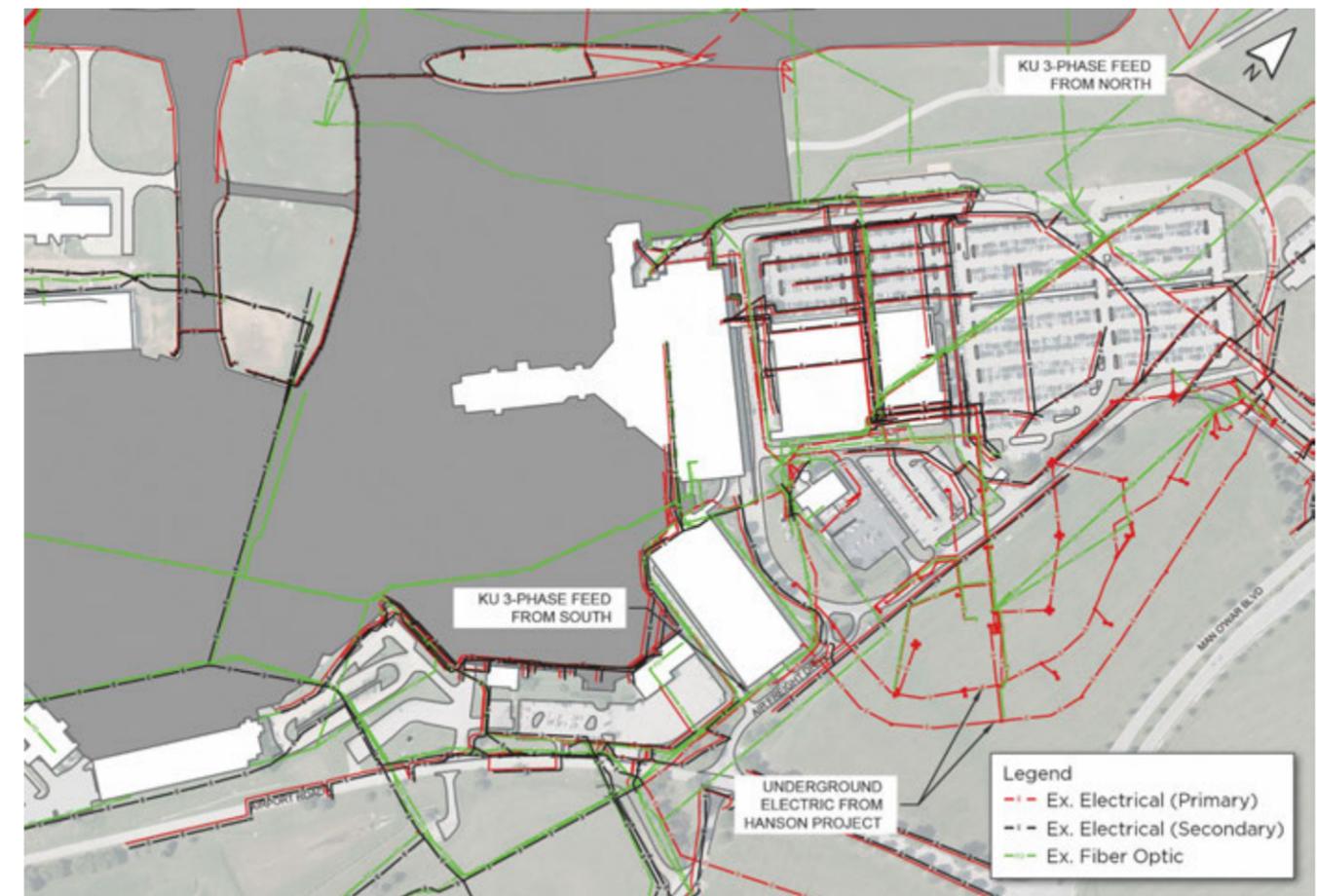
Two primary electrical feeds enter the Airport property, one from the north and one from the south. This dual-feed arrangement provides redundancy and reliability for critical airport operations but also contributes to a dense layout in several areas as depicted in **Exhibit 4.3-2, Existing Electrical and Fiber Optic Feeds**. Beyond the primary feeds, there is a vast network of secondary electrical services that distributes power the Airport and its facilities. This intricate network of secondary lines is essential to day-to-day functions but adds significant complexity to any relocation or reconfiguration efforts. Existing transformers are also located along the side of the terminal building, serving both the terminal itself and adjacent facilities. These transformers are positioned in areas that conflict with the proposed expansion through Phase III and will require relocation. This relocation will need to be carefully sequenced to maintain uninterrupted power to critical airport operations during construction.

Fiber Optics and Communications

The Airport is served by numerous fiber optic lines supporting a range of services, including redundant communications for the ATCT and terminal building. These systems are critical to airport operations and must be protected throughout any relocation or construction activity. FAA communication lines are present but not publicly mapped or accessible for detailed review, adding a layer of coordination complexity.

Overall, the site's utility layout is heavily layered as depicted in Exhibit 4.3-2, reflecting years of incremental changes. This creates challenges for expansion and reiterates the importance of a well-planned relocation strategy to organize and future-proof the infrastructure while respecting the operational priorities of the airport.

Exhibit 4.3-2 – Existing Electrical and Fiber Optic Feeds

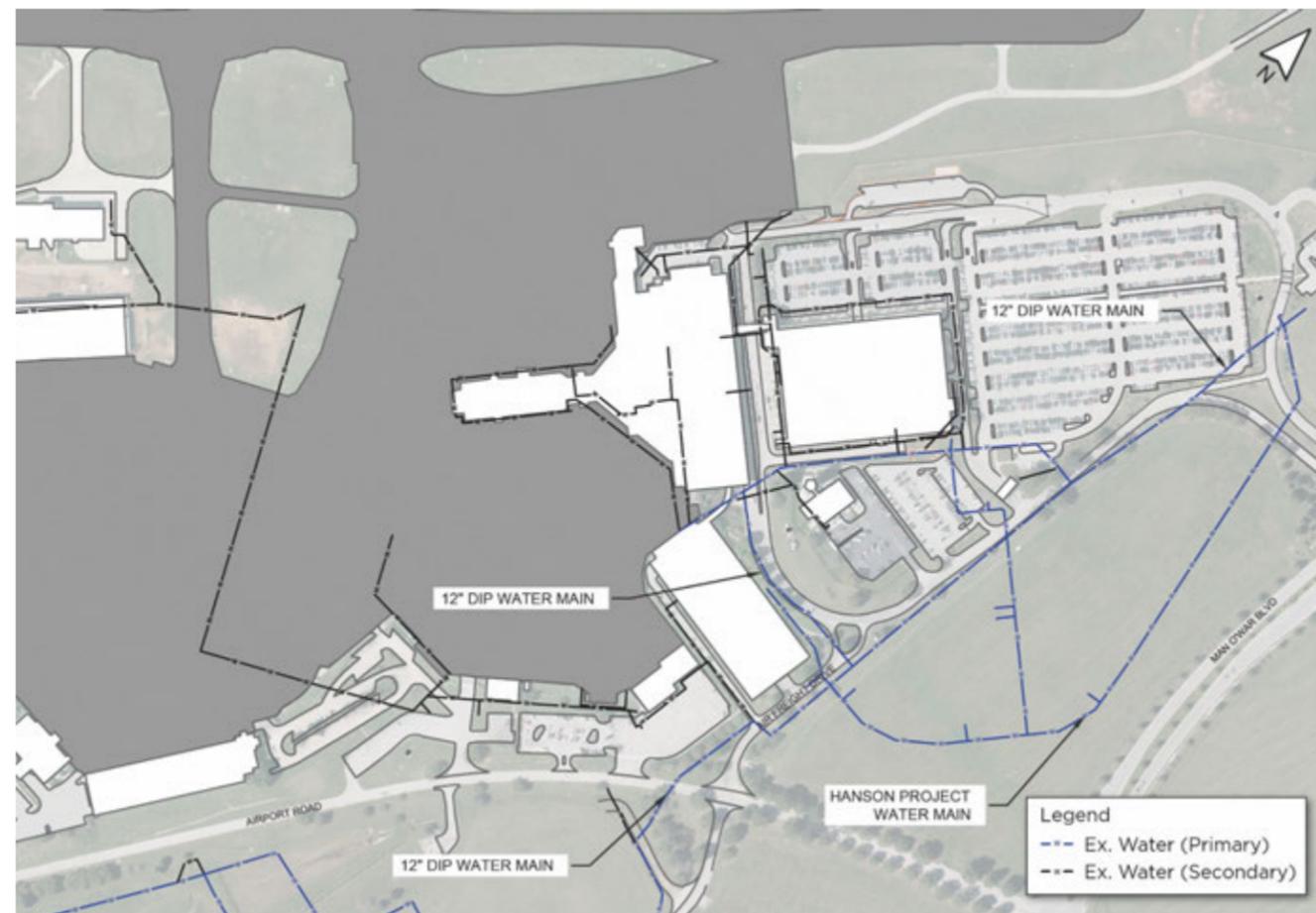


Source: WSP, CMT

Water

The water main enters the property from the north side of the Airport and extends across the site, ultimately tying back into the city’s main on the south side. This through-connection provides a reliable looped system for the airport, ensuring redundancy and stability of water pressure. However, its alignment through multiple developed areas of the property requires careful consideration for any relocation or tie-ins to support future facilities. Branching off from the main, there is a secondary water distribution network supplying service to the rest of the Airport, including terminal facilities, hangars, maintenance areas, and airfield systems. **Exhibit 4.3-3, Existing Water Main Network**, depicts the existing water lines serving the Airport property.

Exhibit 4.3-3 – Existing Water Main Network

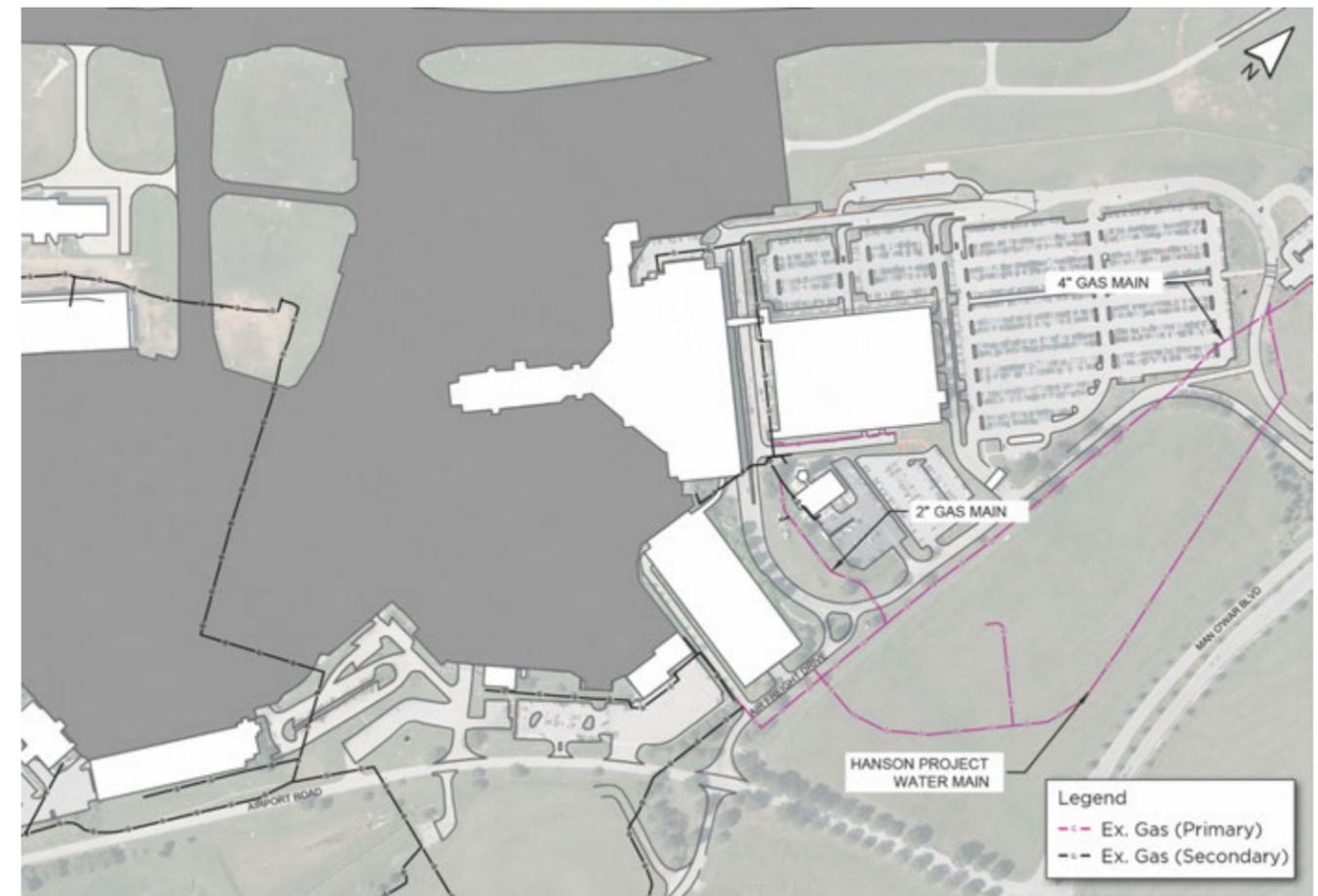


Source: WSP, CMT

Natural Gas

Gas service is provided to the Airport exclusively from the north side of the property. From this point of entry, a network of gas distribution branches out to serve various buildings and facilities across the property as depicted in **Exhibit 4.3-4, Existing Natural Gas Network**. The alignment of both the primary gas main and its secondary service lines must be considered alongside the proposed utility corridors to avoid conflicts and maintain accessibility for maintenance.

Exhibit 4.3-4 – Existing Natural Gas Network

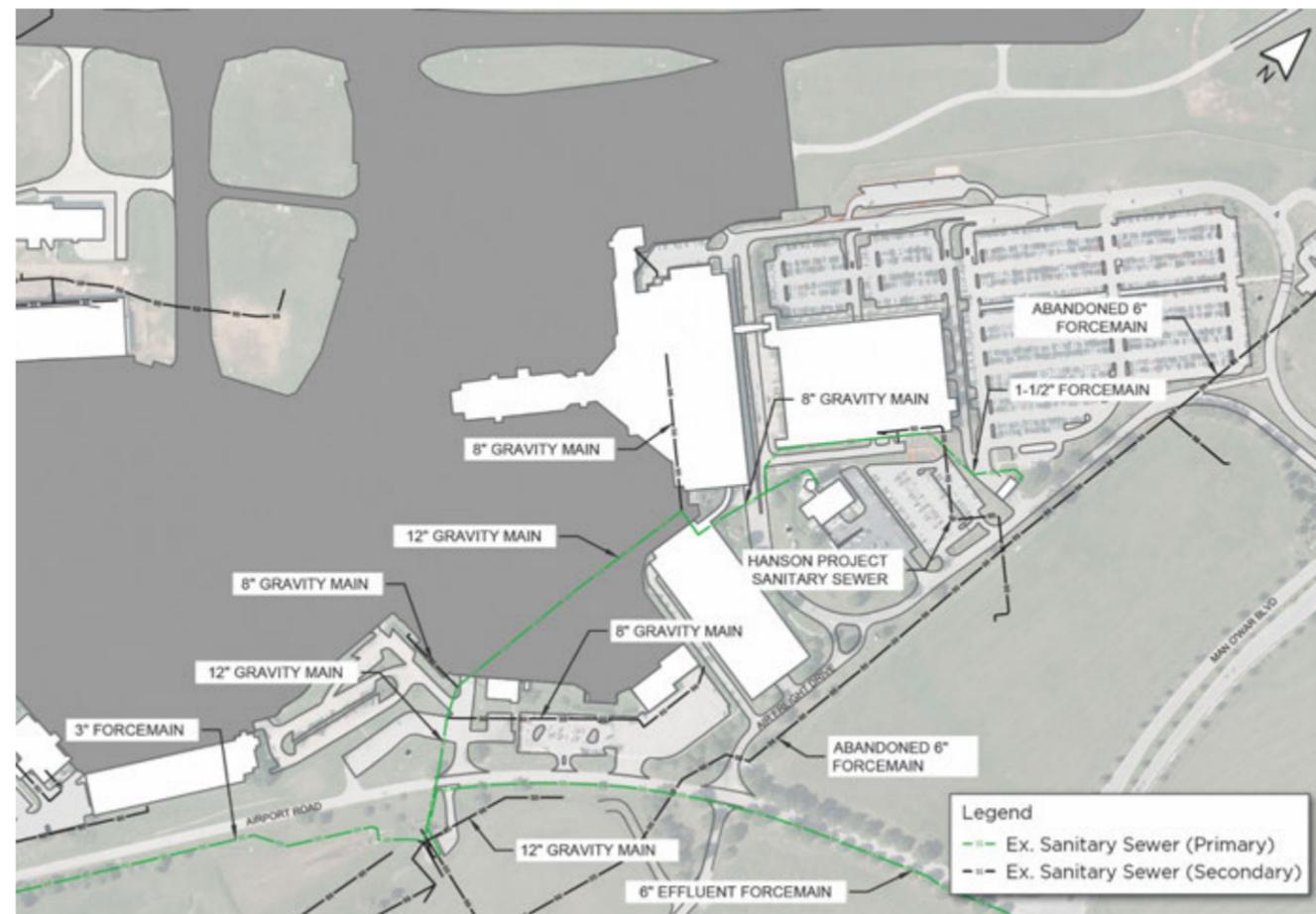


Source: WSP, CMT

Sanitary Sewer

All sanitary sewer flows from the Airport are collected and directed to a pump station on the south side of the property which then discharges to the nearby treatment plant south of the Airport. With the planned growth in Airport facilities and most notably the passenger terminal, additional consideration, study, and coordination with City water treatment personnel should occur as the Airport proceeds through the terminal implementation to ensure there is adequate treatment capacity to accommodate any increase in flows. **Exhibit 4.3-5, Existing Sanitary Sewer Network**, presents the network of sanitary sewer lines at the Airport.

Exhibit 4.3-5 – Existing Sanitary Sewer Network



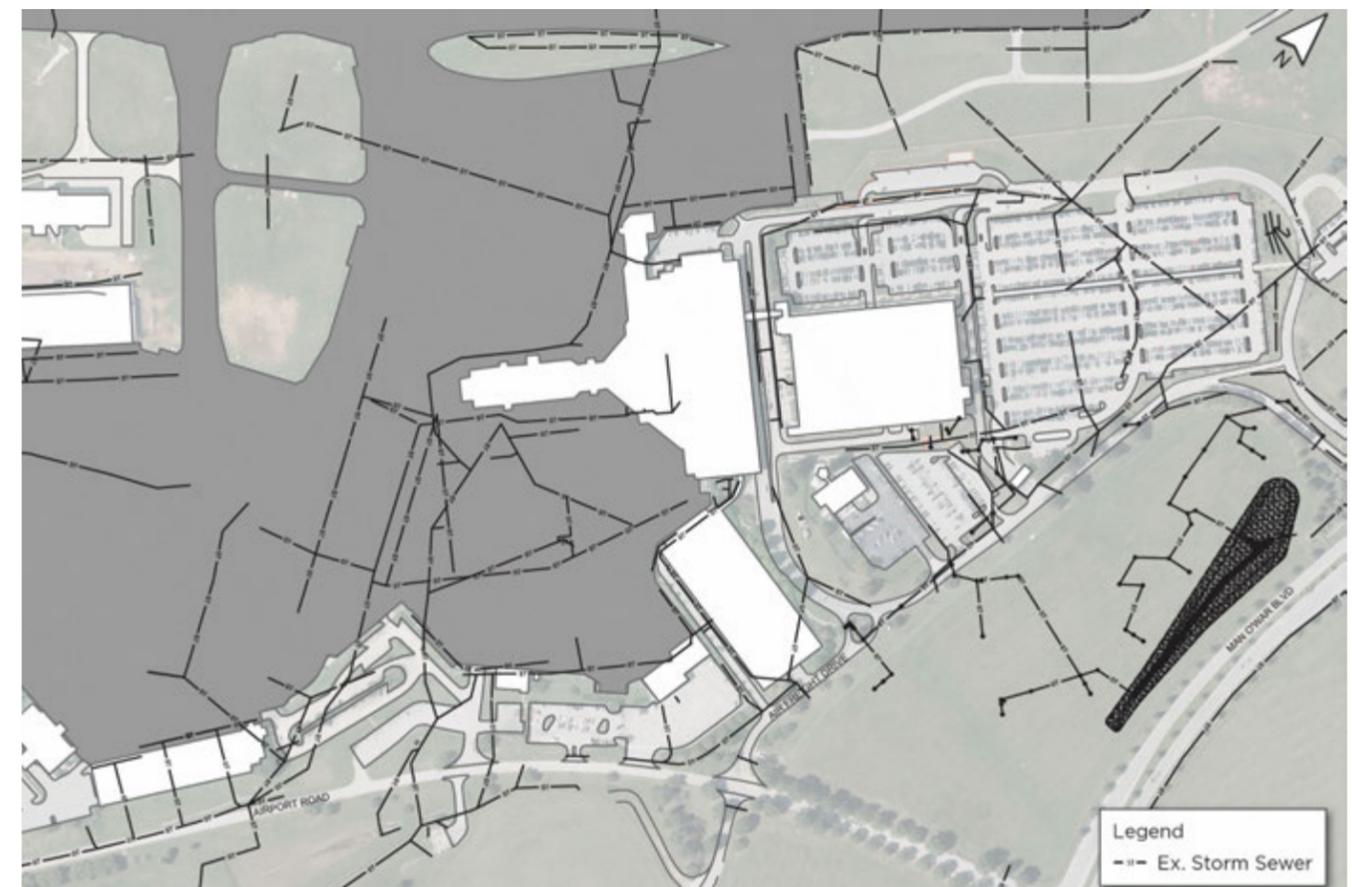
Source: WSP, CMT

Stormwater

The Airport’s stormwater system consists of an established network of inlets, underground storm sewer pipes, and outfalls that collect and convey runoff from airfield pavements, terminal area surfaces, and parking facilities. The system is designed to discharge to designated outfall points in accordance with the Airport’s overall drainage plan. Several sections of this existing network run through the terminal area and cross locations that fall within the proposed construction limits for the terminal expansion and ready-return parking deck. These alignments create potential conflicts with building foundations, roadway modifications, and the proposed utility corridors.

With the addition of the expanded terminal and rental car ready-return facility, there will be an increase in impervious surface area and a corresponding increase in stormwater runoff volume. The existing storm sewer system will need to be evaluated to determine whether it has adequate capacity to handle these additional flows or if expansion and upsizing of certain segments will be required. This consideration will be especially important at downstream segments and outfalls where flows from multiple drainage areas converge. The existing storm sewer network is depicted in **Exhibit 4.3-6, Existing Stormwater Network**.

Exhibit 4.3-6 – Existing Stormwater Network



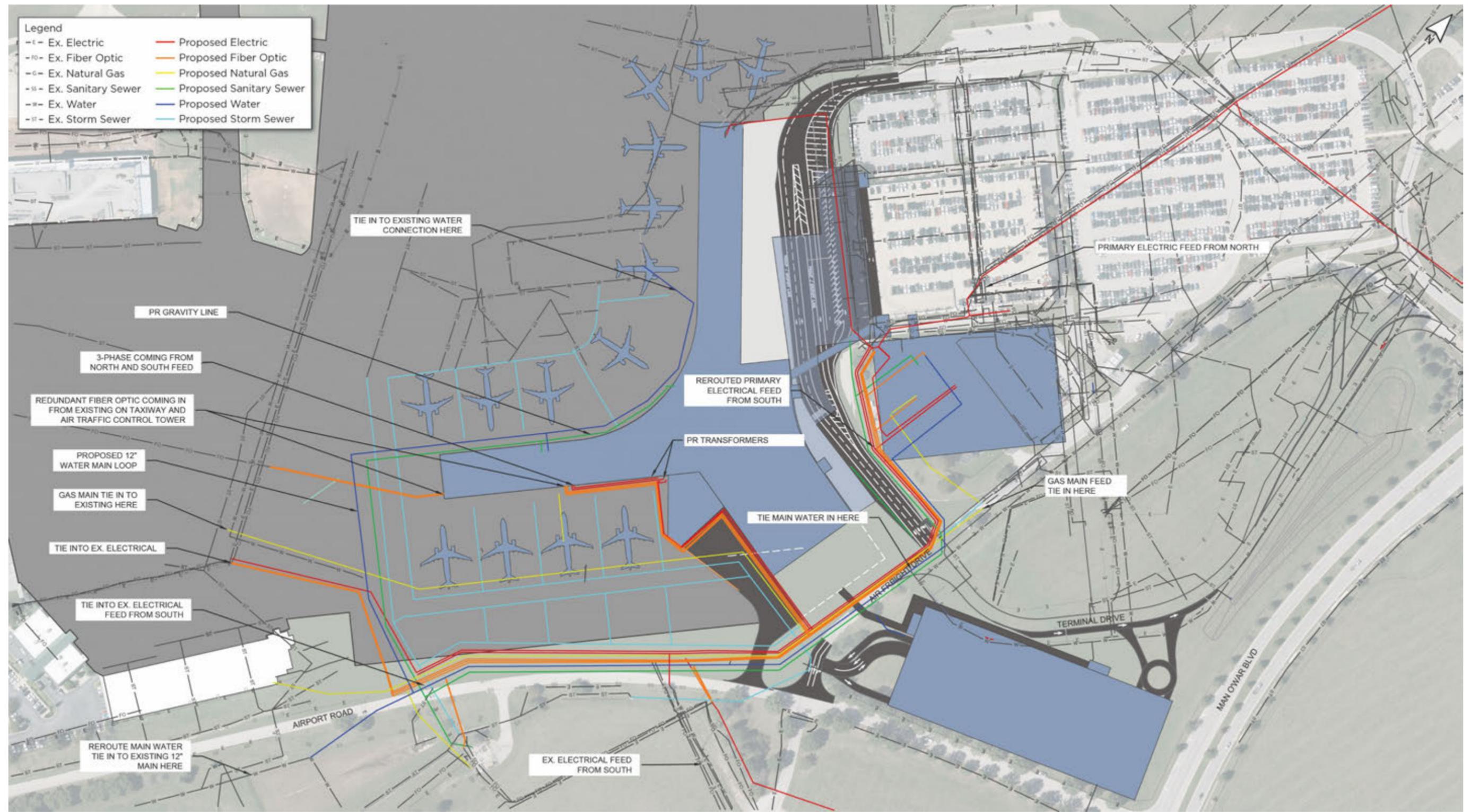
Source: WSP, CMT

4.3.2 Conceptual Alternatives

As part of the conceptual planning for the TAP, a recommended utility plan was developed for the shortlisted terminal conceptual alternatives. **Exhibit 4.3-7, Utility Recommendations – Concept 4**, and **Exhibit 4.3-8, Utility Recommendations – Hybrid Concept**, present an overview of the utility recommendations centered around the ultimate implementation of Concept 4 and the Hybrid Concept respectively. These recommendations should be further refined as part of the design process as the Airport moves forward with either concept. At a high level, these recommendations include:

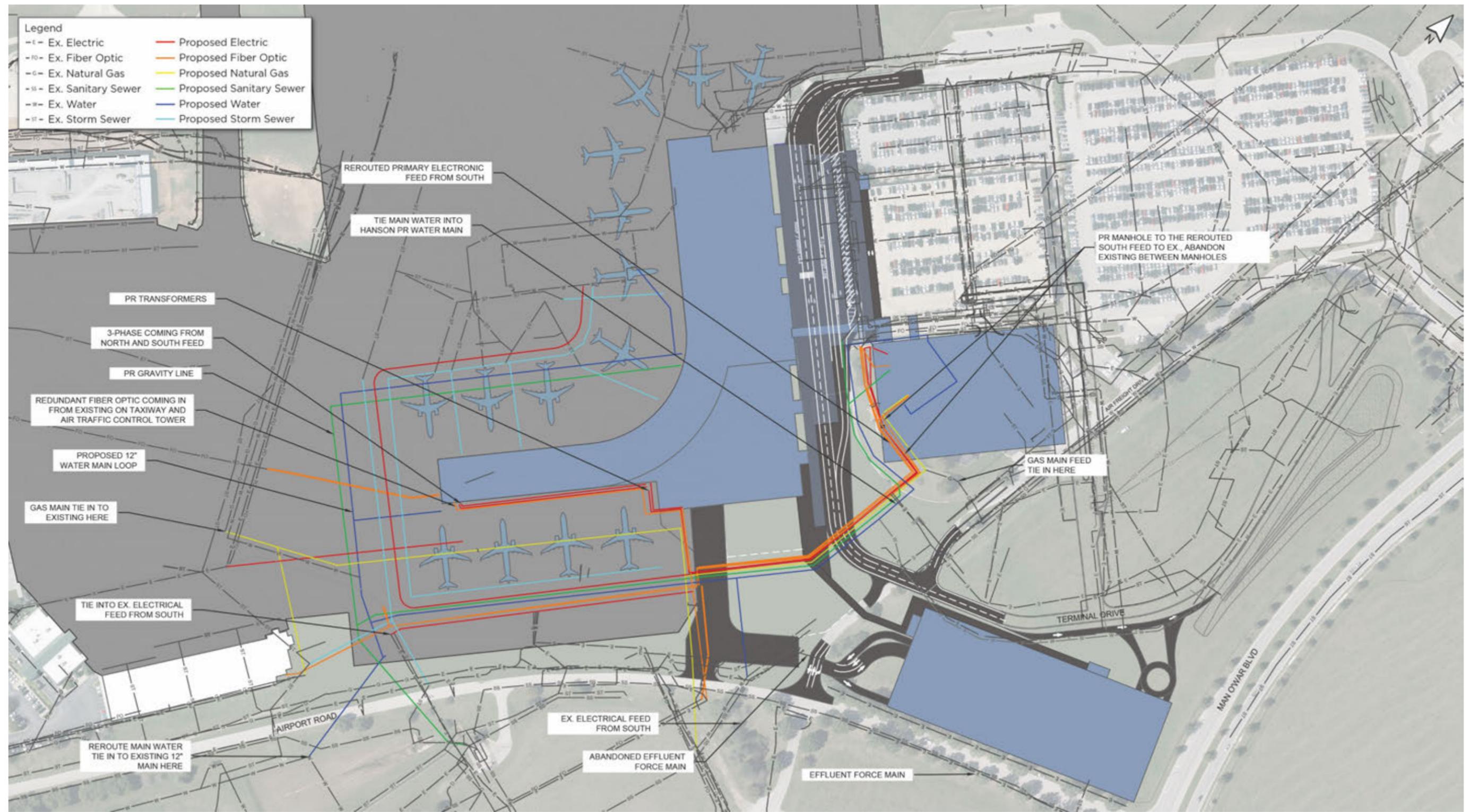
- A 50-foot-wide utility corridor aligned parallel to Airport Road and Air Freight Drive, with routing adjustments to fit the proposed terminal footprint and parking deck configuration.
- Additional open space created along certain segments of the alignment, providing greater flexibility for future expansion and improved construction access.
- Branch connections extend from the corridor to serve the new terminal building, air traffic control tower, ready-return parking deck, and other key facilities.
- Redundant fiber optic pathways and dual primary electrical feeds from the north and south brought directly into the terminal and control tower for operational resiliency.
- Integration with existing systems ensures that utilities not impacted by the project remain in service, avoiding disruptions to critical airport operations.
- Phased construction approach required—major utility relocations must be completed before the conclusion of Phase III to support terminal and parking deck construction without delays.
- Protection of critical airport systems through careful coordination, particularly for FAA-controlled communications and other essential operational infrastructure.

Exhibit 4.3-7 – Utility Recommendations – Concept 4



Source: WSP, CMT

Exhibit 4.3-8 – Utility Recommendations – Hybrid Concept



Source: WSP, CMT

4.4 Stormwater & Deicing Fluid Collection

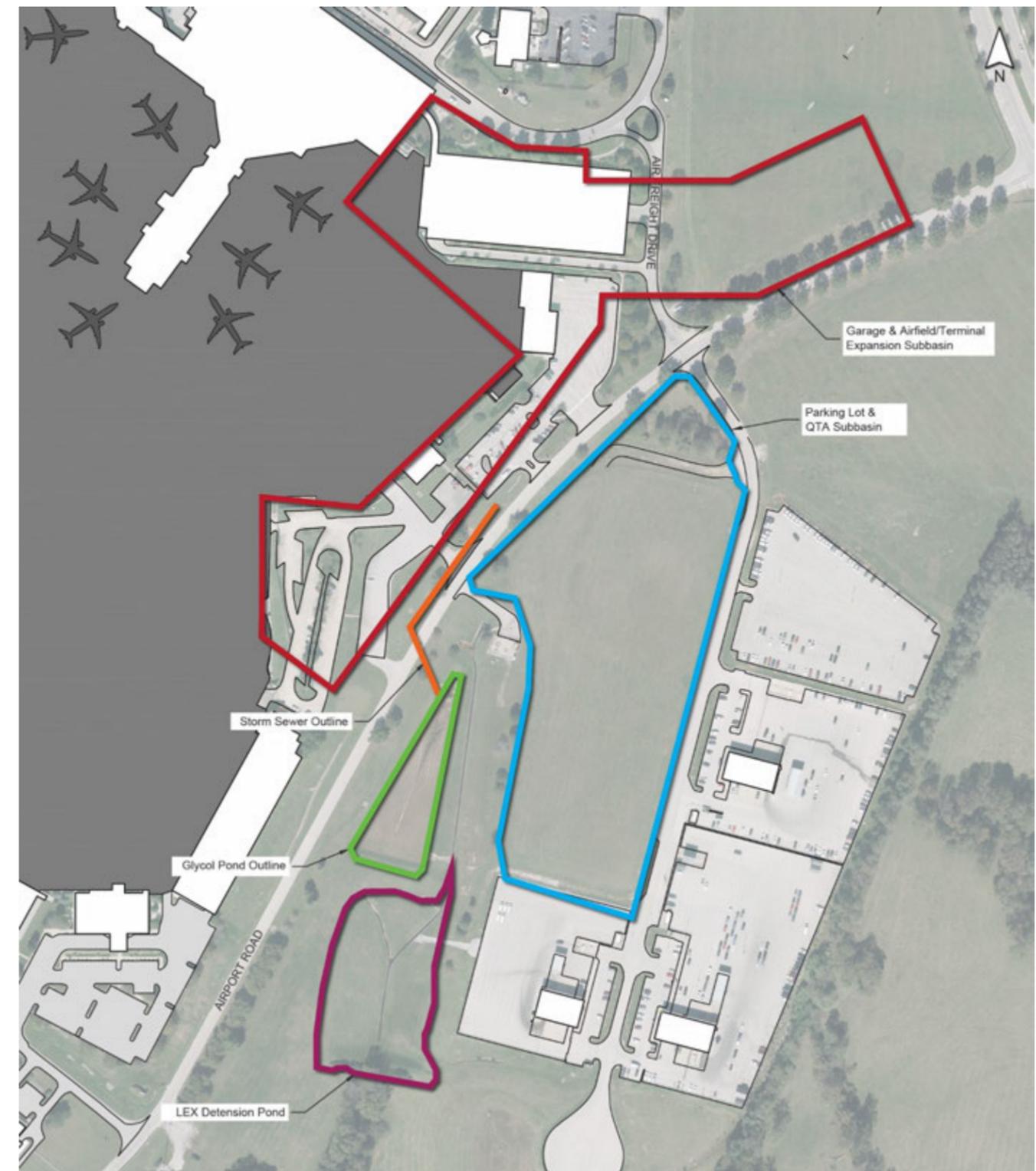
As part of the overall scope of work for the TAP, a conceptual level analysis of existing stormwater collection features and future demand was undertaken. To that end, a hydrologic analysis was performed to determine the associated preliminary runoff volumes, per the guidelines of the Kentucky Drainage Manual, and stormwater detention/release solutions will be outlined for Phase III and the Full Build-Out phases of both Concept 4 and the Hybrid Concept. Given the similar size and capacity of each concept in terms of stormwater demand, the analysis presented herein is applicable to both.

The recommendations utilize the existing detention basin structures that capture runoff from the landside changes made along Airport Road and Air Freight Drive. They include a detention pond for diluting glycol positioned between Airport Road and Air Freight Drive and another detention basin directly downstream. Reconfiguration of these detention ponds, in accordance with the Kentucky Drainage Manual, will accommodate the projected increase in runoff.

4.4.1 Subbasins

Subbasins were defined based on the facility recommendations made in the TAP for future structures, phased building renovations, and areas reserved for future development as way to refer to the three separate areas referenced herein. These areas of improvement include a new Terminal Expansion Subbasin (inclusive of the new Rental Ready/Return Facility) and the Flex Warehouse/QTA Subbasin. These subbasins will be incorporated into the hydrological analysis to determine the change in runoff resulting from the recommended improvements. The area reserved for future development next to Man o' War Boulevard was not considered in this analysis, as a separate drainage pond is planned to detain/release runoff from the property. The subbasins are identified in **Exhibit 4.4-1, Stormwater Collection Subbasins**.

Exhibit 4.4-1 – Stormwater Collection Subbasins



Source: WSP, CMT

4.4.2 Existing Detention

The optimal locations to detain water are the existing Glycol Pond and Detention Basin, positioned between Airport Road and Air Freight Drive (also identified in Exhibit 4.4-1) as they are located directly downstream of the subbasins and therefore capture the resulting sheet flow from each. These sites should be able to be utilized and improved to catch and release runoff resulting from these areas upon completion of the TAP recommendations both through Phase III and the Ultimate build-out.

Glycol Pond

The existing Glycol Pond is used to dilute discharge generated from deicing operations taking place on the aircraft apron. The collected glycol is discharged through a storm sewer connection and flows out via a 42-inch concrete headwall into the Glycol Pond. The pond has a depth of approximately three feet, with its bottom at an elevation of 931.5 feet; a concrete emergency overflow spillway is located at an elevation of approximately 934.5 feet. If the discharge exceeds specified Biochemical Oxygen Demand (BOD) and Total Organic Carbon (TOC) concentration levels, it is directed to a sanitary sewer via a pump station for further treatment at the municipal wastewater treatment facility. Otherwise, the diluted effluent can be released downstream through the Detention Basin.

Surrounding the Glycol Pond are three concrete headwall inlets — a 48-inch, a 54-inch, and a 60-inch— that drain stormwater runoff into two concrete channels. These channels converge just south of the Glycol Pond at the detention basin.

Detention Basin

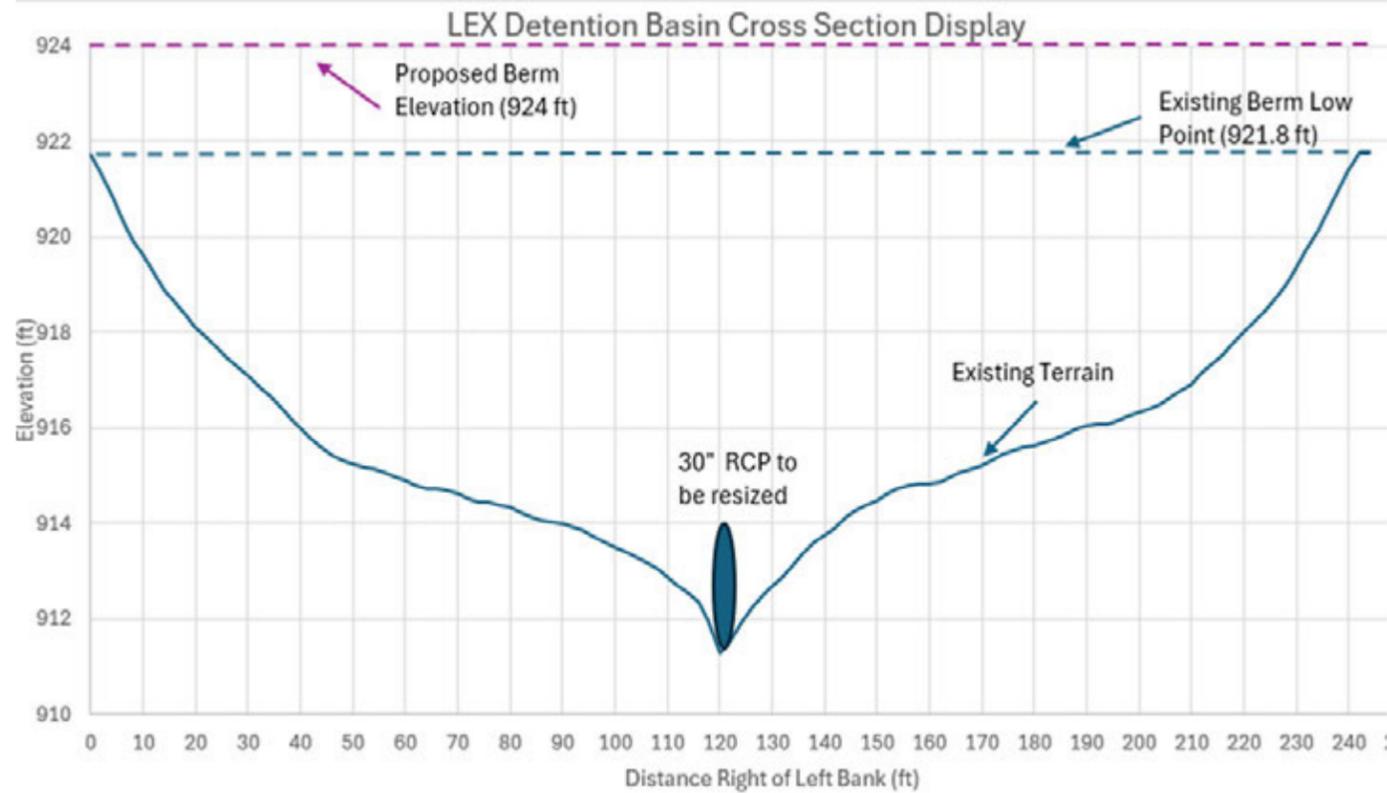
The existing detention basin identified in **Exhibit 4.4-2, Existing Detention Basin**, consists of low ground surrounded by the high embankments of Airport Road and Air Freight Drive, with a berm at a height of 921.5 feet downstream. The concrete channel joins with a 30-inch RCP culvert within the berm at an upstream invert of 912 feet, which outlets to Sterling Tributary and Conrad Creek further south. **Exhibit 4.4-3, Existing Detention Basin Cross-Section**, presents a cross-section profile of the existing detention basin.

Exhibit 4.4-2 – Existing Detention Basin



Source: WSP, CMT

Exhibit 4.4-3 – Existing Detention Basin Cross-Section



Source: WSP

4.4.3 Projected Stormwater Volumes

Per Section 403 of the Kentucky Transportation Cabinet (KYTC) Drainage Manual, the modified rational method was employed to determine the peak runoff volumes from the landside areas of improvements recommended by the TAP. The utilization of this hydrologic analysis is applicable as the total area of improvements is well under 200 acres. The total calculated runoff volumes for Phase III and the Full Build Out of each concept are approximately 0.89 acre-feet and 0.97 acre-feet, respectively, which corresponds to the 100-year annual exceedance probability storm. These volumes are a conservative estimate and are subject to refinement as more precise designs are developed through the program implementation. Key hydrologic parameters utilized for the runoff calculations for each phase are presented in **Table 4.4-1, Subbasin Hydrologic Parameters**.

Table 4.4-1 – Subbasin Hydrologic Parameters

Phase	Total Area of Improvement (acres)	Existing Impervious Area (acres)	Time of Concentration (minutes)	100-year Runoff Volumes (acre feet)
Phase III	20.7	6.5	5	0.89
Full Build-Out	21.9	6.5	5	0.97

Source: WSP

4.4.4 Stormwater Recommendations

To increase stormwater storage capacity, two options were considered: excavating the Glycol Pond and detention basin, as well as adding more embankment to the berms. A determination was made to incorporate both sites for detention to mitigate the strain caused by utilizing one site to capture all the increased runoff. Furthermore, an additional foot of freeboard for the detention basins was considered, as required by the KYTC Drainage Manual.

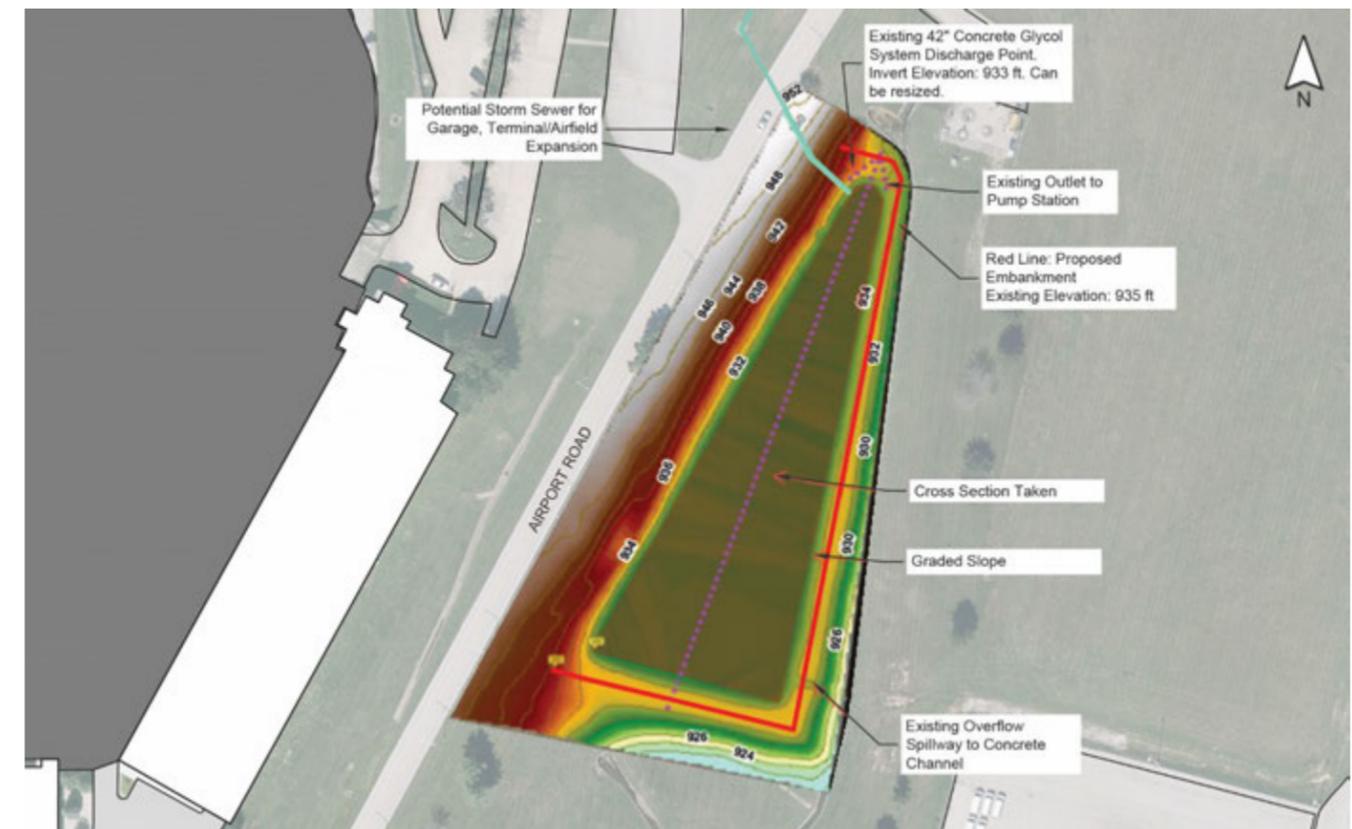
Basin Modification

To accommodate the additional 0.89 and 0.97 ac-ft of runoff and meet the KYTC Drainage Manual freeboard requirement, it was determined that the Glycol Pond and the Detention Basin would need 2 feet of embankment to be added to the berms. To compensate for the reduction in storage capacity resulting from grading the slope, additional embankment may be required on the berm of the Glycol Pond, additional embankment to grade the slope of the base may be required. Additionally, the glycol pond's concrete overflow spillway will require reconfiguration as the surrounding embankment heightens. The total embankment quantities and associated costs are subject to change. **Exhibit 4.4-4, Glycol Pond Recommendations – Plan View, and Exhibit 4.4-5, Glycol Pond Recommendations – Cross Section**, present the recommended improvements to the existing Glycol Pond to enhance capacity as needed.

Storm Sewers

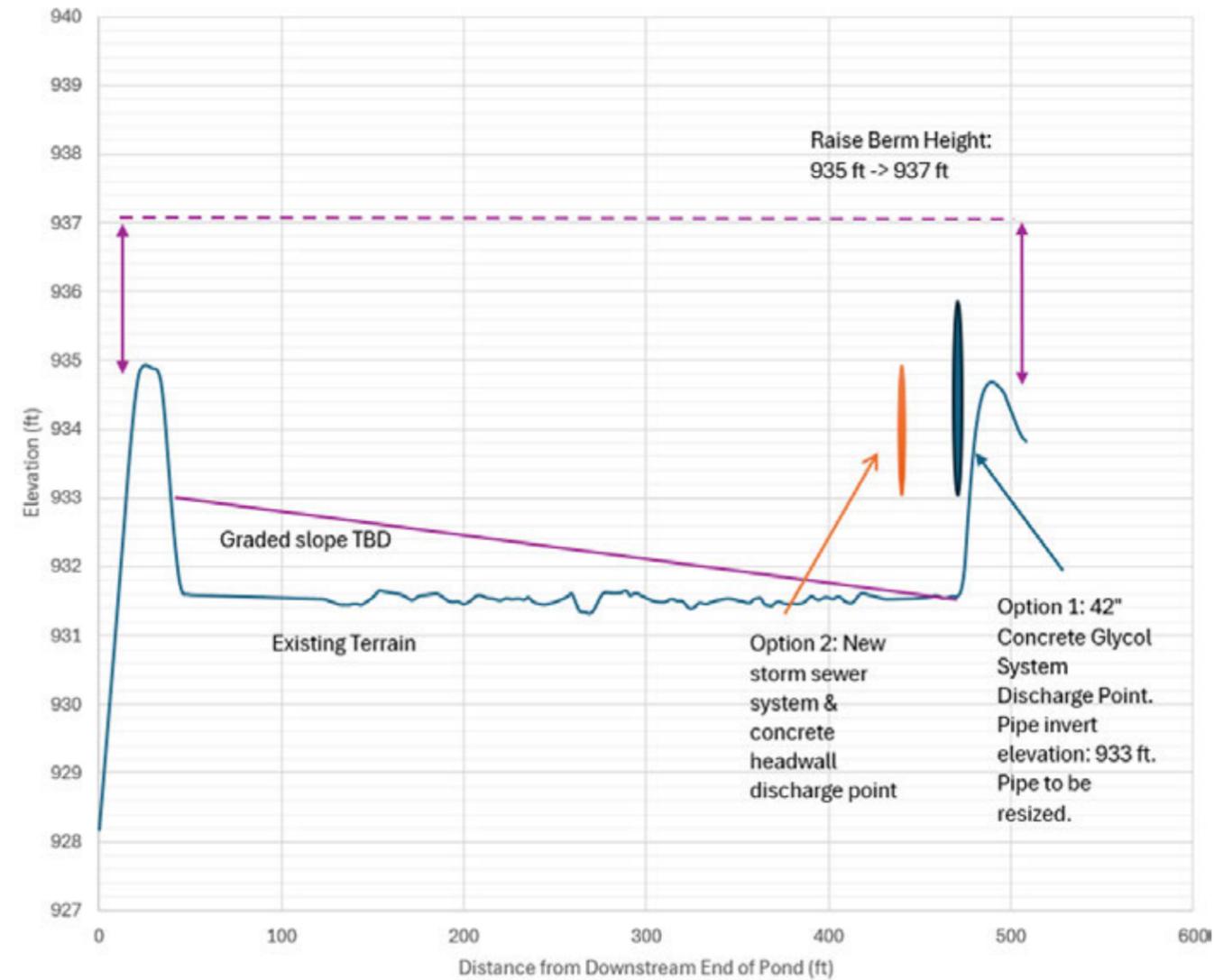
To guide stormwater into the basins and reduce sheet flow, storm sewers may be included in the preliminary analysis when needed. A storm sewer system would be used to direct flow from the Terminal Expansion Subbasin to the Glycol Pond. One option is to develop a new, complete sewer network. A drop box inlet will be installed at the lowest point of the subbasin, and manholes will be used where the storm sewer changes direction. A concrete headwall may be placed downstream at the Glycol Pond, possibly next to the existing Glycol Pond headwall. Alternatively, the new storm sewer system can be connected to the existing Glycol sewer network at a designated manhole location. As a result, the downstream pipe and existing outlet would need to be upsized to accommodate additional runoff. This option is recommended because it minimizes potential conflicts with other existing utilities. The Flex Warehouse/QTA Subbasin may not need a storm sewer as the subbasin lies adjacent to the detention basin downstream, so long as the developed area is not regraded to contain sag points, which may cause ponding if a storm sewer system isn't installed. The parking lot can have cuts along the curb to direct runoff to the detention basin. Riprap can be installed along the downstream embankment to prevent erosion.

Exhibit 4.4-4 – Glycol Pond Recommendations – Plan View



Source: WSP

Exhibit 4.4-5 – Glycol Pond Recommendations – Cross Section



Source: WSP

Glycol Impacts

According to the LEX Deicer Management System Evaluation Technical Memorandum, the storage capacity of the glycol pond should increase by 30 percent to accommodate the increased glycol inflows associated with the proposed improvements of the full build-out of either concept. These changes include the proposed terminal footprint, the proposed terminal ramp modification, and the corresponding increases in future flight operations. This projection is a conservative value that addresses potential limitations that can be associated with the pump station flow capacity. Additionally, it is expected that the maximum allowable BOD concentration threshold for discharging glycol to the stream will increase. Therefore, the increase in glycol discharge does not pertain to any increase associated with glycol being discharged into the sanitary sewer system for future treatment. A glycol forecast/dilution analysis should be conducted to compare the future design storm runoff volumes and glycol inflows to determine the amount of glycol that can be stored and released to the creek or released to the sanitary sewer. This predictive modeling would take the allowable BOD concentrations, allowable TOC concentrations, other environmental factors/concentrations, and the increased storage capacity of the Glycol Pond into account.

Section Five

Phasing Strategy & Cost Estimates

5.1 Phasing Strategy

The Passenger Terminal program is envisioned to be completed in multiple phases to minimize the impact to airport operations and to align with the Airport’s financial capacity. The phasing narratives and diagrams presented in this section are representative of the major project elements and are not intended as detailed explorations of subphases which may be required throughout the project.

The conceptual level phasing was also developed to inform the rough order of magnitude cost estimating by contemplating phase durations which allows a better understanding of the impact that cost escalation may have on the overall project cost. In total Concept 4 is envisioned to be implemented over the span of seven total phases while the implementation of the Hybrid Concept is envisioned to require ten phases. **Exhibit 5.1-1, Phasing Timeline Comparison**, presents a comparison of the phasing timelines of each assuming continuous implementation of the phases without breaks. The exhibit calls out various “decision points” along each program timeline. These decision points are intended to act as potential pause points in the program for the Airport if/when needed. The cost depicted at each decision point indicated the cumulative amount spent on the terminal program to that point. Consideration should be given to the placement and routing of utilities, as well as the relationship between their associated corridors and adjacent facilities (such as the Terminal Building and Rental Ready Return Facility) especially at the early program decision points. The location of these utilities should be influenced by the ultimate development direction of the passenger terminal building (Concept 4 vs. the Hybrid Concept).

Exhibit 5.1-1 – Phasing Timeline Comparison



Source: CMT, Alliance, Vistara

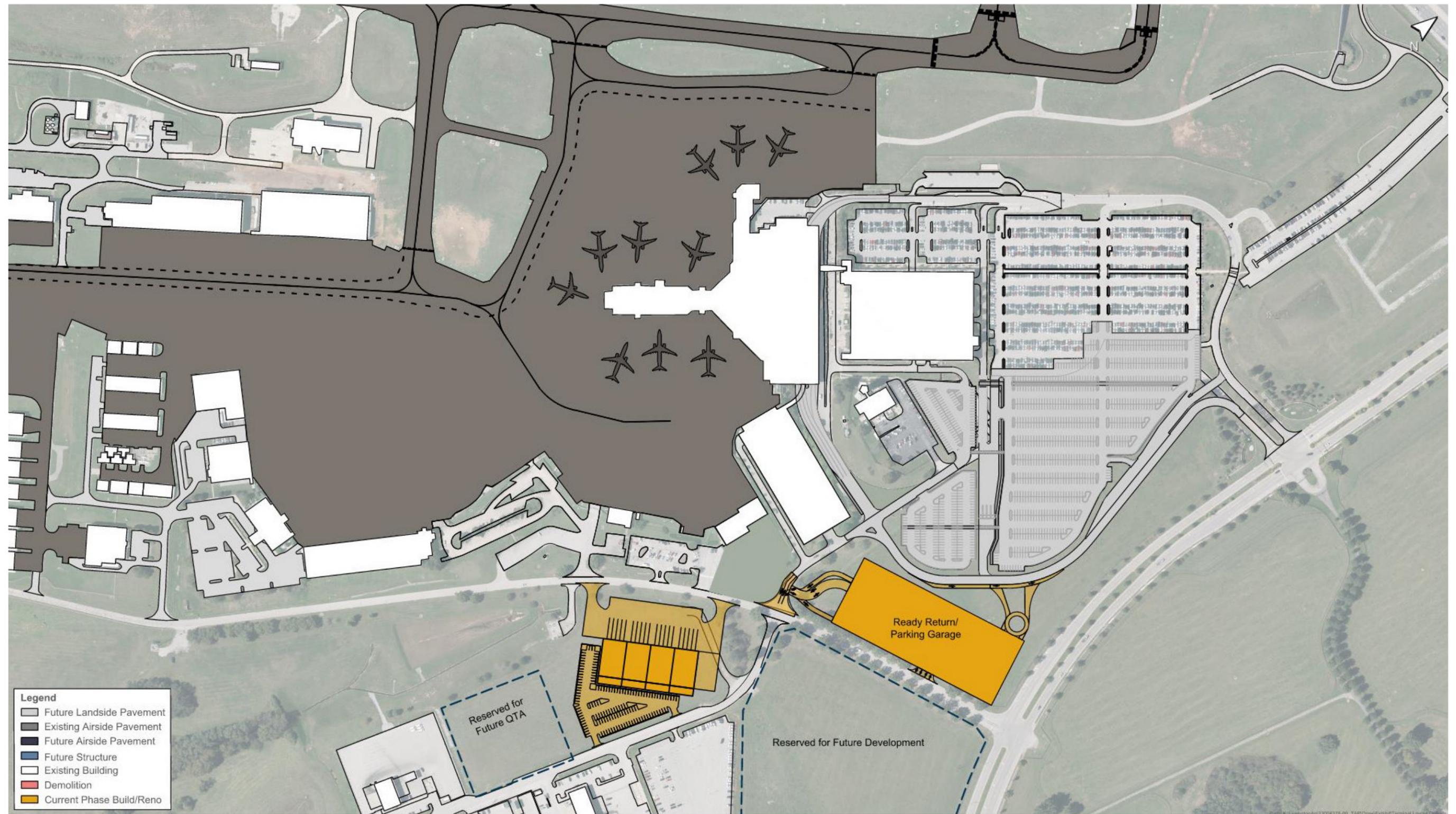
5.2 Enabling Projects

Phase I of each of the two refined concepts is identical and includes enabling work to allow the initial expansion of the terminal and concourse structures on the east side of the existing terminal. The Phase I “Enabling Projects” are presented in **Exhibit 5.2-1, Phase I – Enabling Projects**.

The first major step of Phase I is the construction of a new Rental Ready/Return Facility. Tex Sutton, Customs and Border Protection (CBP), and a Delta Air Cargo (GSE maintenance facility) that are currently located on the eastern edge of the concourse apron all require relocation. In parallel with the construction of the new Rental Ready/Return Facility, new flex warehousing space will be constructed on the opposite side of Airport Road to accommodate the relocation of the Tex Sutton and Delta Air Cargo operations. The relocation of CBP is being accommodated within the newly constructed Hangar One in the east GA area.

The anticipated duration of construction activities to complete the enabling work is approximately eight months.

Exhibit 5.2-1 – Phase I – Enabling Projects



Source: CMT

5.3 Concept 4 Phasing

As described earlier in this section, the initial phase of both alternatives includes identical enabling work. The following subsections present the subsequent phases of development for Concept 4 following the enabling work of Phase I.

5.3.1 Phase II

The second phase of construction for Concept 4 for description and decision making purposes has been split into two sub-phases, Phase IIA and Phase IIB. Overall Phase II increases gate capacity through the construction of a new eight-gate concourse. The new concourse ties into the existing terminal buildings post-security circulation near the exit to landside and baggage claim. In addition, the adjacent east apron is expanded toward airport road but does not impact the airport road itself.

To facilitate the construction of the new concourse the existing Concourse B gates B1, B3, B5, and B7 will be decommissioned and the boarding bridges removed. It may be possible to realign one or two of the aircraft positions during construction. Existing interior gate holdroom space for the decommissioned gates on Concourse B can be renovated to provide additional gate holdroom seating for the remaining gates (B2, B4, B6, and B8) on the concourse.

Phase IIA, includes the demolition of the existing Tex Sutton, Delta Air Cargo, and the Rental Ready/Return Facilities that were replaced by the construction proposed in Phase I. In addition to this demolition, site work and preparation for the apron expansion is also proposed in Phase IIA.

Phase IIB proposes the construction of the eight-gate concourse expansion with the associated apron expansion. While these phases have been split into separate sub-phases, it is possible to implement them in a single phase should the Airport elect to do so.

The anticipated duration of construction activities to complete phase two work is 18 months if completed in a single phase **Exhibit 5.3-1, Concept 4 Phase IIA, and Exhibit 5.3-2, Concept 4 Phase IIB**, present the recommendations of each respective sub-phase.

5.3.2 Phase III

The third phase of construction includes the construction of a new two-level terminal headhouse to the east of the existing terminal building and new concourse built in phase 2. The new headhouse includes ticketing and check-in, baggage claim, baggage screening, security screening checkpoint, airport administration offices, and CRDF which replace the existing functions. After completion, departures and arrivals operations can be shifted out of the existing terminal.

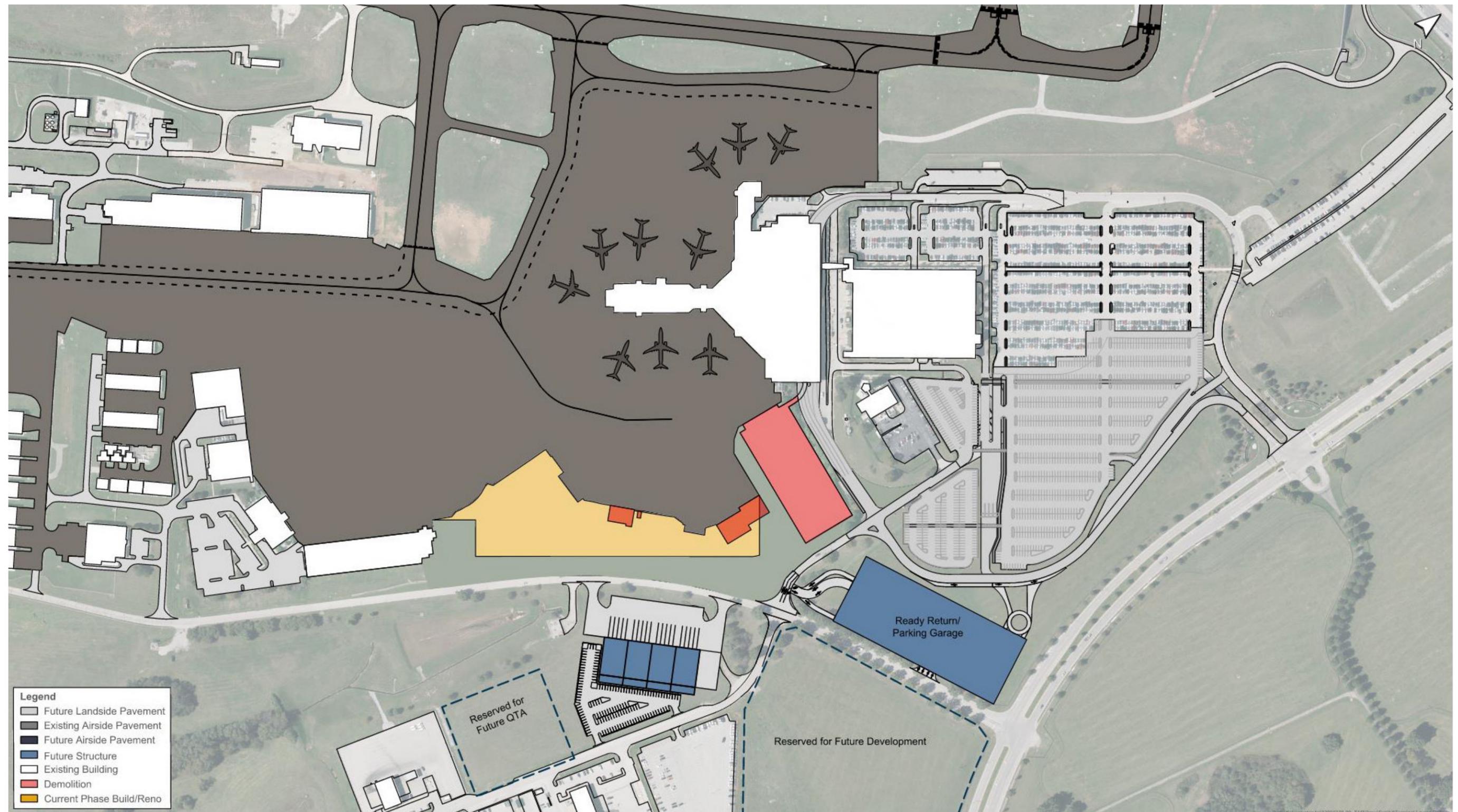
In addition, Phase III begins the improvements to the terminal curbside presented in Section 4.2.1 and the construction of the CRDF presented in Section 4.2.4 of this document. The anticipated duration of construction activities to complete phase two work is 18 months. **Exhibit 5.3-3, Concept 4 Phase III**, presents the recommendations of Phase III.

5.3.3 Phase IV

The fourth phase of construction includes the construction of two concourse connectors from the new concourse to existing Concourse B and a second between the Existing A and B connectors. The connectors allow circulation continuity between the new concourse and headhouse processing functions and the existing concourses. Upon completion of these temporary concourse connectors, the existing terminal headhouse can be demolished. Additionally, a variant of Phase IV allows for the forgoing construction of the concourse connector between existing Concourse B and existing Concourse A to allow for the simultaneous demolition of Concourse A with the existing terminal headhouse. Additional gate demand analysis should be undertaken at the time of implementation to determine if this variant of Phase IV is viable.

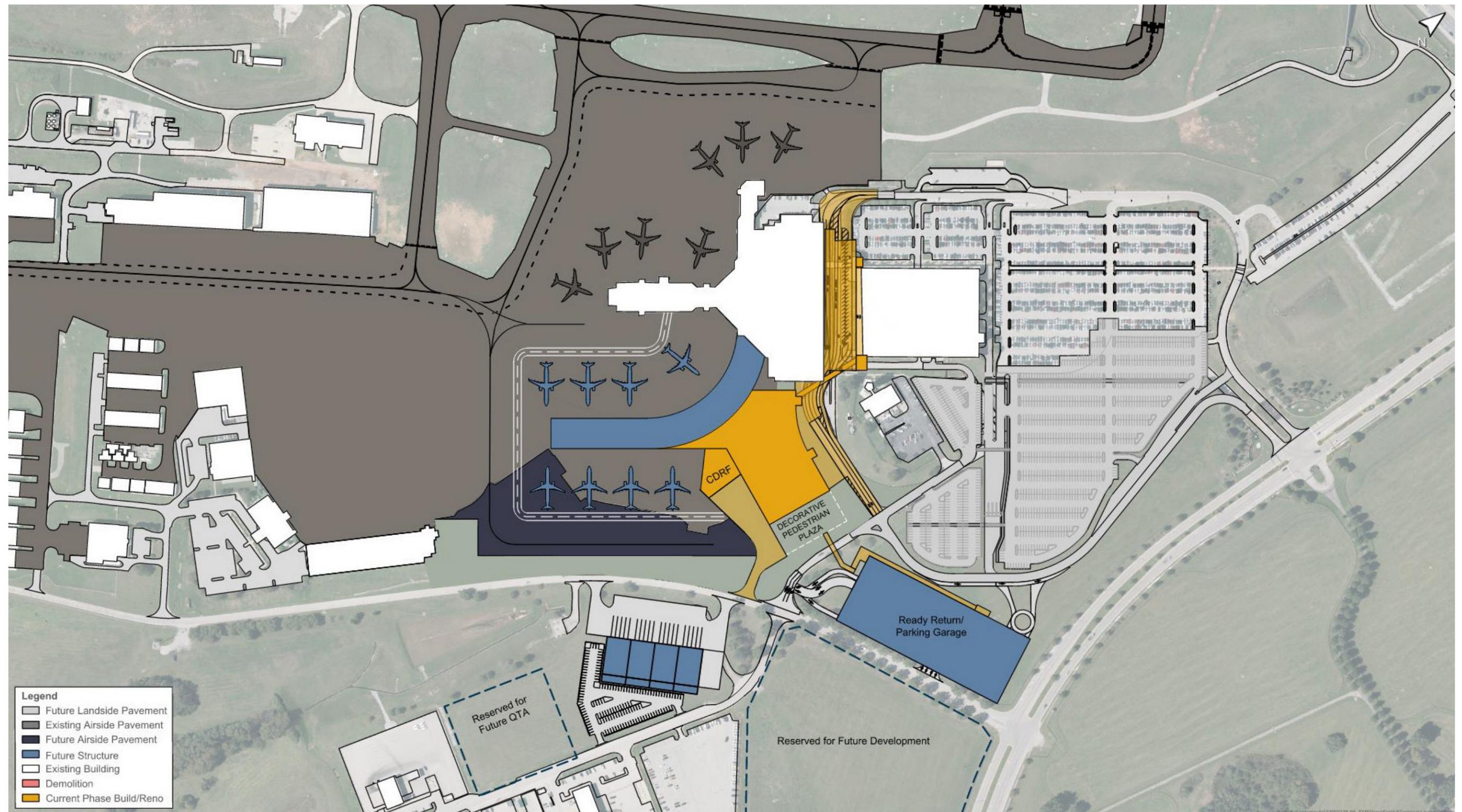
The anticipated duration of construction activities to complete phase two work is 6 months. **Exhibit 5.3-4, Concept 4 Phase IV**, presents the recommendations of Phase IV assuming the construction of the connector between existing Concourses A and B.

Exhibit 5.3-1 – Concept 4 Phase IIA



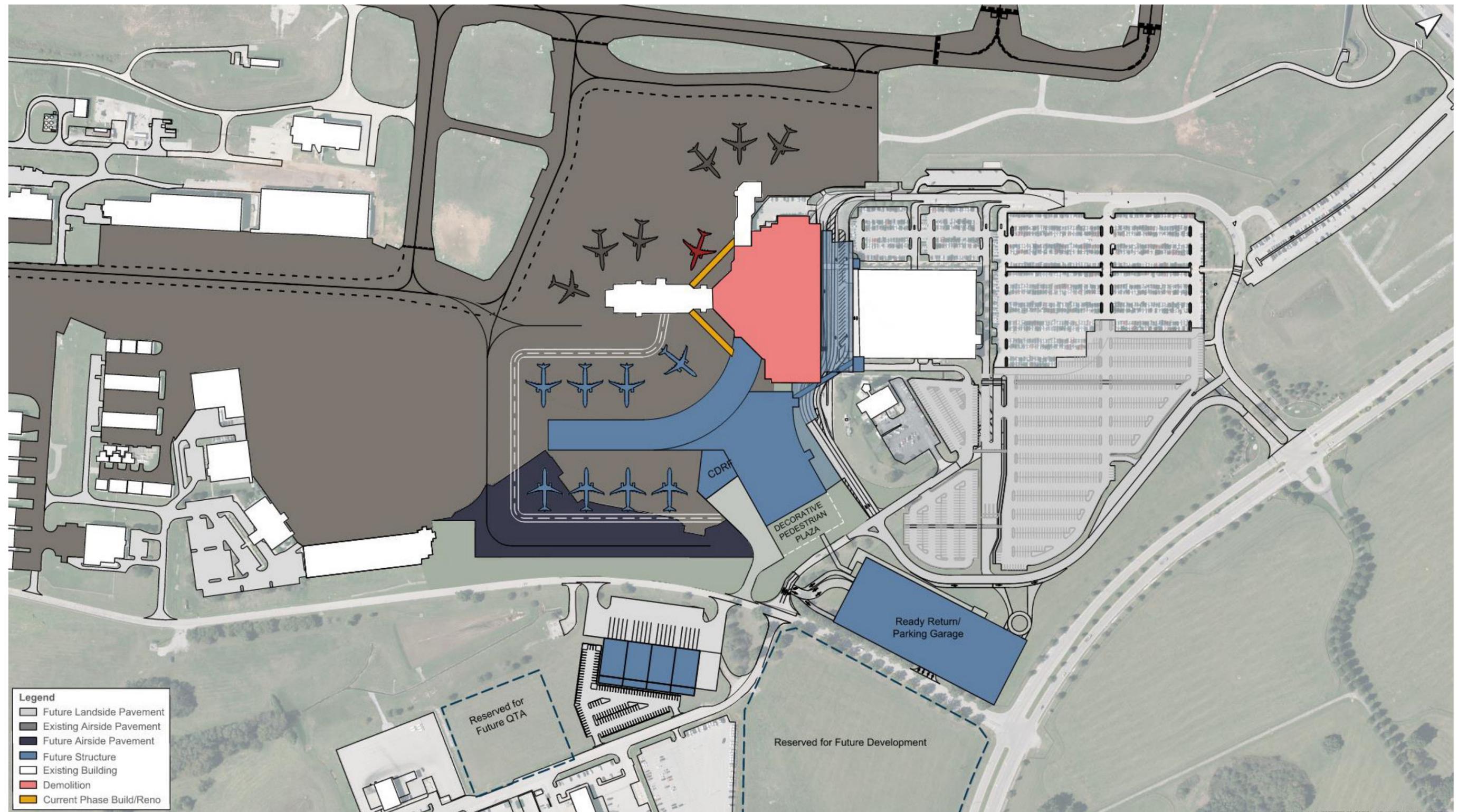
Source: CMT, Alliance, WSP

Exhibit 5.3-3 – Concept 4 Phase III



Source: CMT, Alliance, WSP

Exhibit 5.3-4 – Concept 4 Phase IV



Source: CMT, Alliance, WSP

5.3.4 Phase V

The fifth phase of construction includes the construction of a small expansion of the terminal headhouse as well as a new skybridge and vertical circulation tower at the existing parking structure. The skybridge connection creates direct access from the parking garage to the security screening checkpoint and exit breach control devices on level 2 of the headhouse.

The terminal and concourse reconstruction project continues with the construction/expansion of the new concourse to the northeast. Concourse B gates remain operational during construction but are eventually deactivated when the new gates are online.

The anticipated duration of construction activities to complete phase two work is 16 months. **Exhibit 5.3-5, Concept 4 Phase V**, presents the recommendations of Phase V.

5.3.5 Phase VI

The sixth phase of construction includes the demolition of existing Concourse B and the temporary connector. As part of the concourse demolition a significant portion of the existing terminal apron will be demolished and apron reconstructed in place to tie into adjacent apron areas which may have been reconstructed in previous phases. The expanded public parking capacity presented in Section 3.2.3 is now provided for by way of an additional parking garage directly adjacent to the existing parking garage. It should be noted that for this to occur, the ATCT must have been relocated at this point. If at this point in time the ATCT has not been relocated, alternate locations to provide this additional capacity should be determined.

The anticipated duration of construction activities to complete phase two work is 4 months. **Exhibit 5.3-6, Concept 4 Phase VI**, presents the recommendations of Phase VI.

5.3.6 Phase VII

The seventh and final phase of construction includes setting the final three boarding bridges on the newly completed concourse. The RON/deicing pad located west of the terminal and concourse is now able to be constructed but is not required for the terminal replacement program. In addition, the improvements to the landside curbside and Ground Transportation Center may now be completed as sufficient distance between the façade of the terminal building and the existing parking garage now exists.

The anticipated duration of construction activities to complete phase two work is 2 months. **Exhibit 5.3-7, Concept 4 Phase VII**, presents the recommendations of Phase VII.

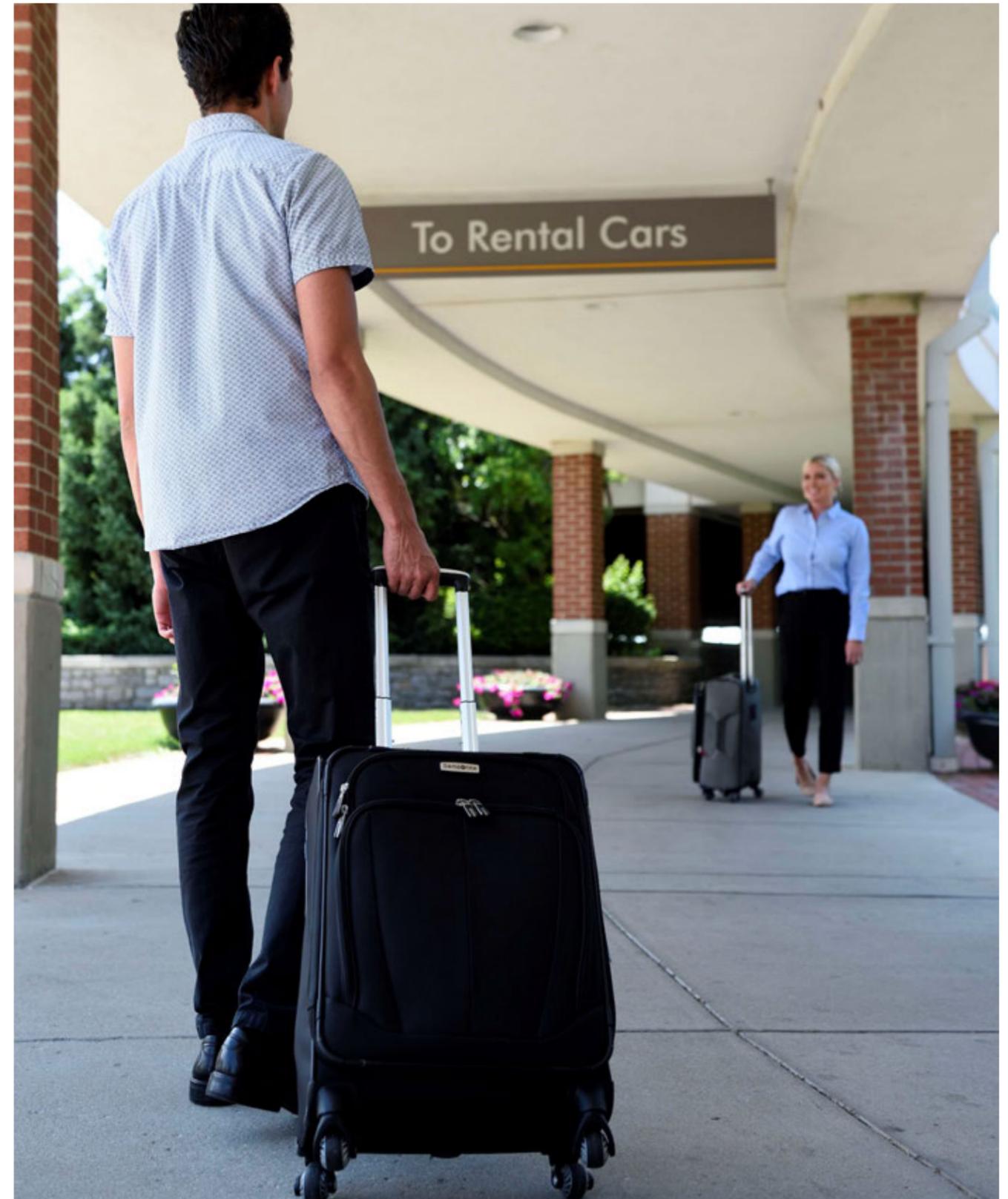
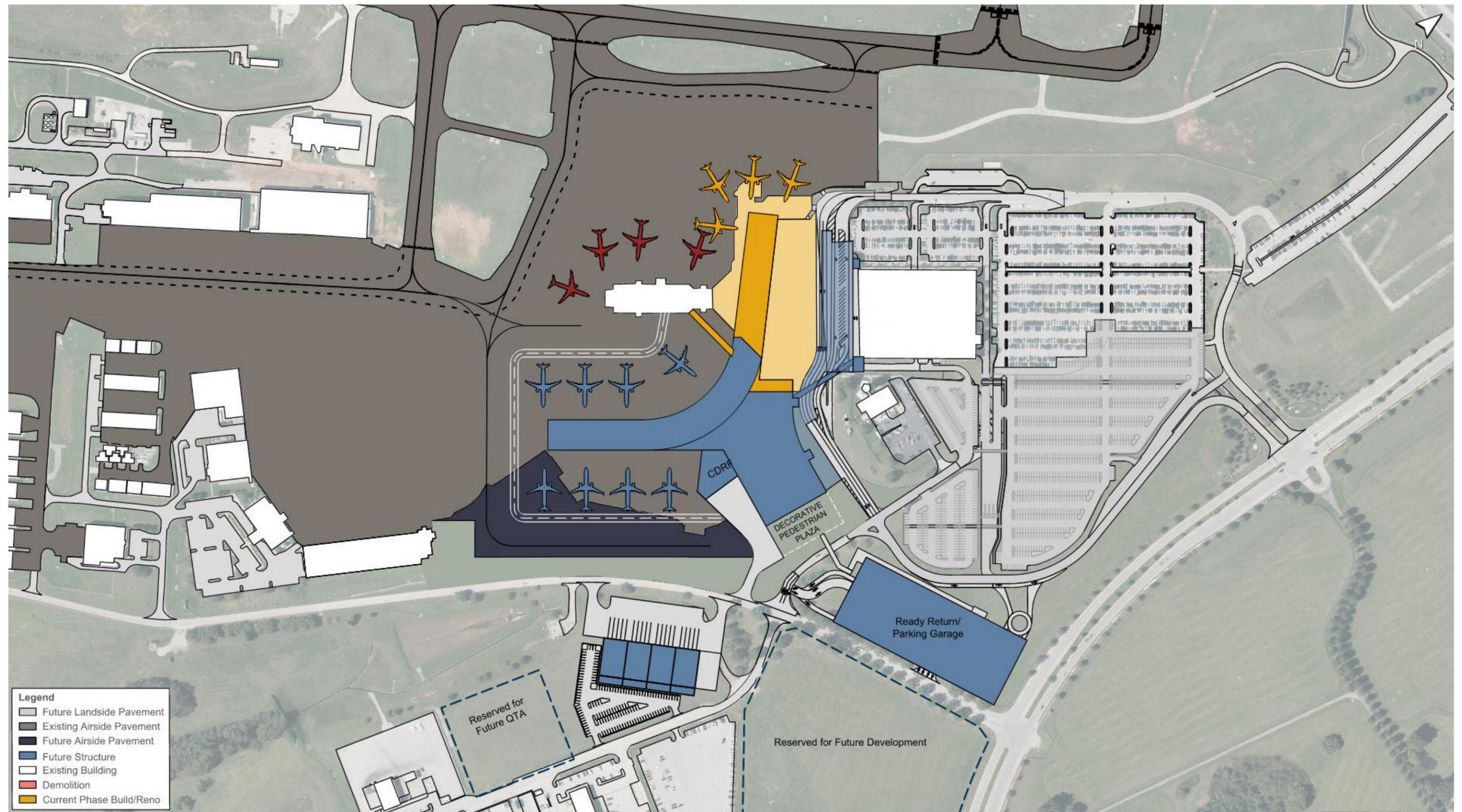
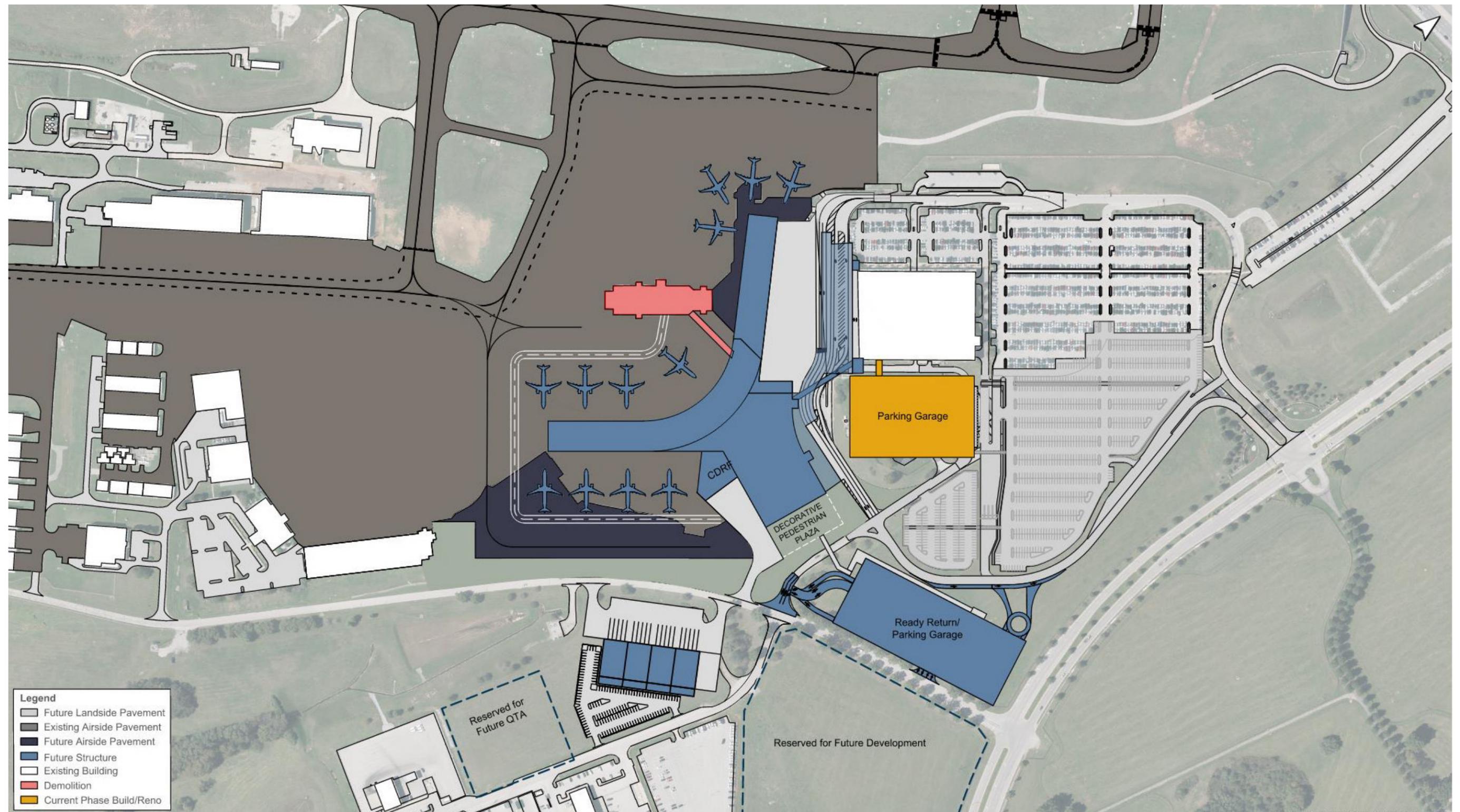


Exhibit 5.3-5 – Concept 4 Phase V



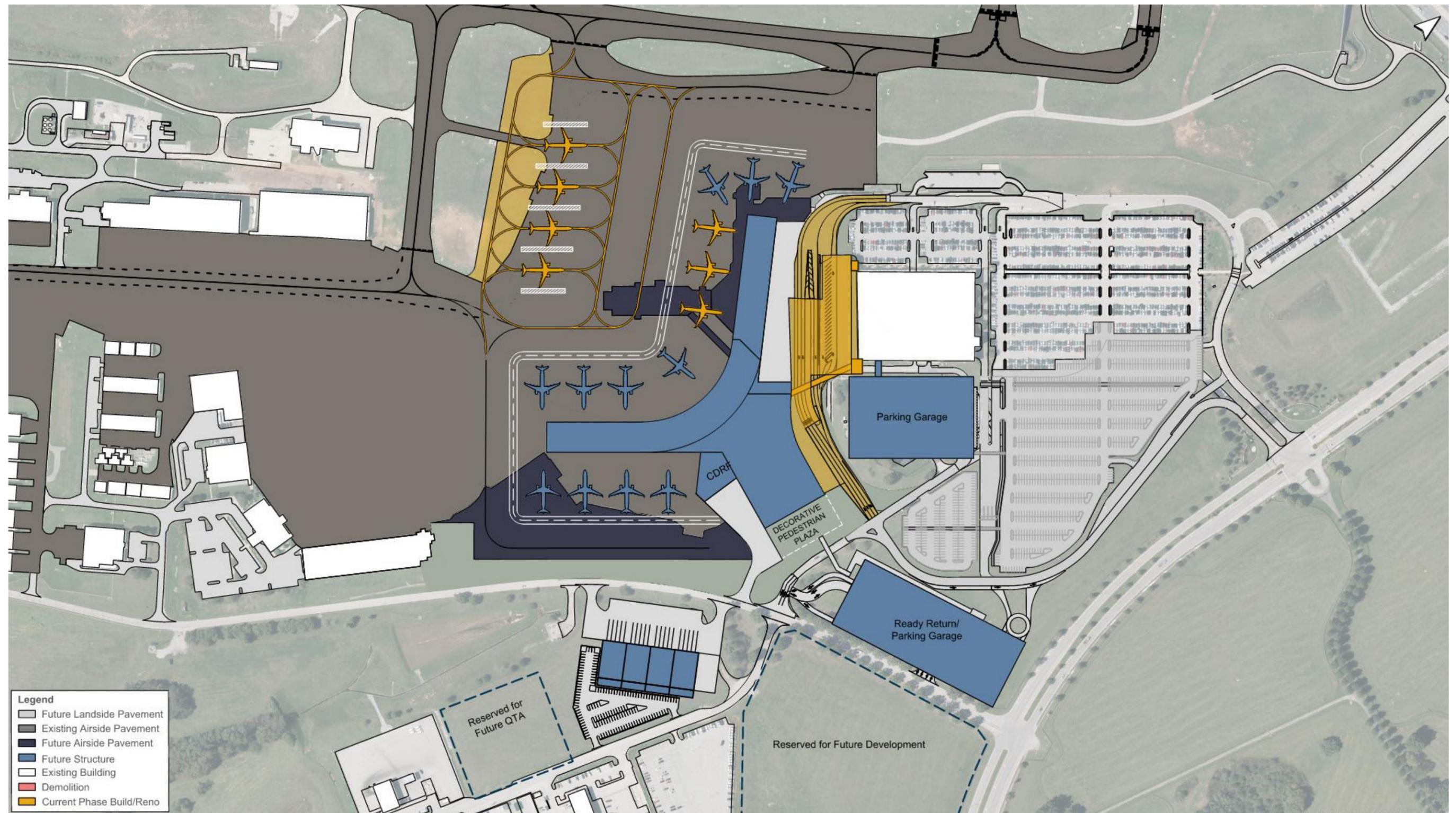
Source: CMT, Alliance, WSP

Exhibit 5.3-6 – Concept 4 Phase VI



Source: CMT, Alliance, WSP

Exhibit 5.3-7 – Concept 4 Phase VII



Source: Source Information

5.4 Hybrid Concept Phasing

The following subsections present the anticipated phasing plan for the implementation of the Hybrid Concept. As presented earlier in this section, Phase I for the Hybrid Concept is identical to Phase I for Concept 4 which was presented in Section 5.1.

5.4.1 Phase II

Similar to Concept 4, the second phase of construction for the Hybrid Concept has been split into two subphases, Phase IIA and Phase IIB, for description and decision-making purposes. Overall Phase II increases gate capacity through the construction of a new eight-gate concourse. The new concourse ties into the existing terminal buildings post-security circulation near the exit to landside and baggage claim. In addition, the adjacent east apron is expanded toward airport road but does not impact the airport road itself.

To facilitate the construction of the new concourse the existing Concourse B gates B1, B3, B5, and B7 will be decommissioned and the boarding bridges removed. It may be possible to realign one or two of the aircraft positions during construction. Existing interior gate holdroom space for the decommissioned gates on Concourse B can be renovated to provide additional gate holdroom seating for the remaining gates (B2, B4, B6, and B8) on the concourse.

Phase IIA, includes the demolition of the existing Tex Sutton, Delta Air Cargo, and the Rental Ready/Return Facilities that were replaced by the construction proposed in Phase I. In addition to this demolition, site work and preparation for the apron expansion is also proposed in Phase IIA.

Phase IIB proposes the construction of the eight-gate concourse expansion with the associated apron expansion. While these phases have been split into separate sub-phases, it is possible to implement them in a single phase should the Airport elect to do so.

The anticipated duration of construction activities to complete phase two work is 18 months if completed in a single-phase **Exhibit 5.4-1, Hybrid Concept Phase IIA, and Exhibit 5.4-2, Hybrid Concept Phase IIB**, presents the recommendations of each respective sub-phase.

5.4.2 Phase III

The third phase of the Hybrid Concept implementation includes the construction of a new baggage claim hall, CRDF with new vehicle access from Airport Road at the end of the existing terminal headhouse. Additional details on the CRDF are presented in Section 4.2.4. In addition to the vertical construction, Phase 3 includes the beginning of the improvements to the terminal curbside Terminal Drive realignment presented in Section 4.2.1.

In addition to the terminal expansion, existing baggage claim areas are converted into additional airline ticketing and check-in counters and Airline Ticketing Office (ATO) space. At the northwest end of the terminal headhouse, the existing pre-security concessions spaces are demolished to allow the existing TSA security screening checkpoint to be expanded.

The anticipated duration of construction activities to complete phase three work is 18 months. **Exhibit 5.4-3, Hybrid Concept Phase III**, presents the recommendations of Phase III.

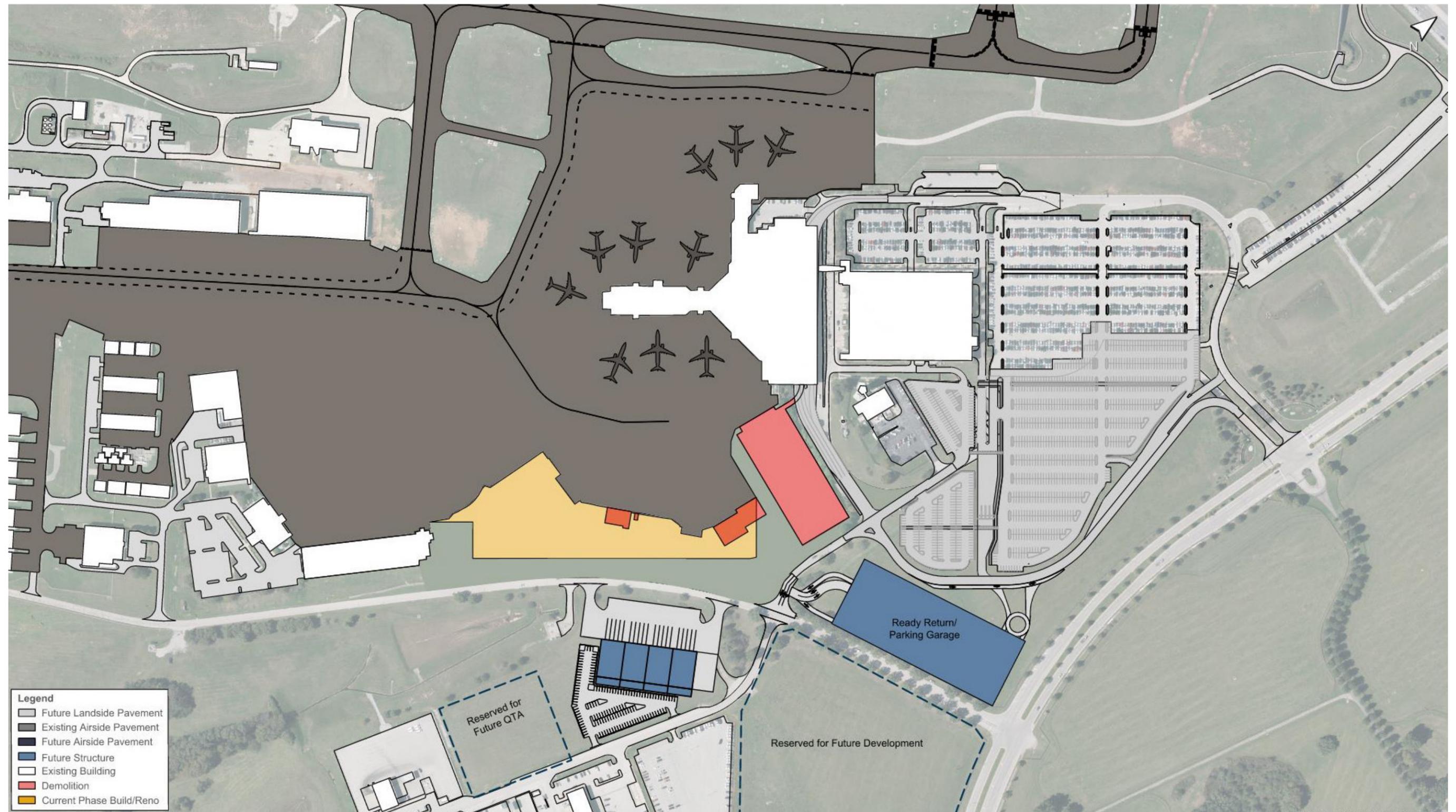
5.4.3 Phase IV

The fourth phase of construction for the Hybrid Concept includes demolition of the first section of the existing terminal headhouse. Following the demolition, the new structure is built infilling between the baggage claim expansion, expanded concourse, and existing headhouse.

Phase four also includes the fit-out and relocation of the airport administration offices to the mezzanine space above the new baggage claim area.

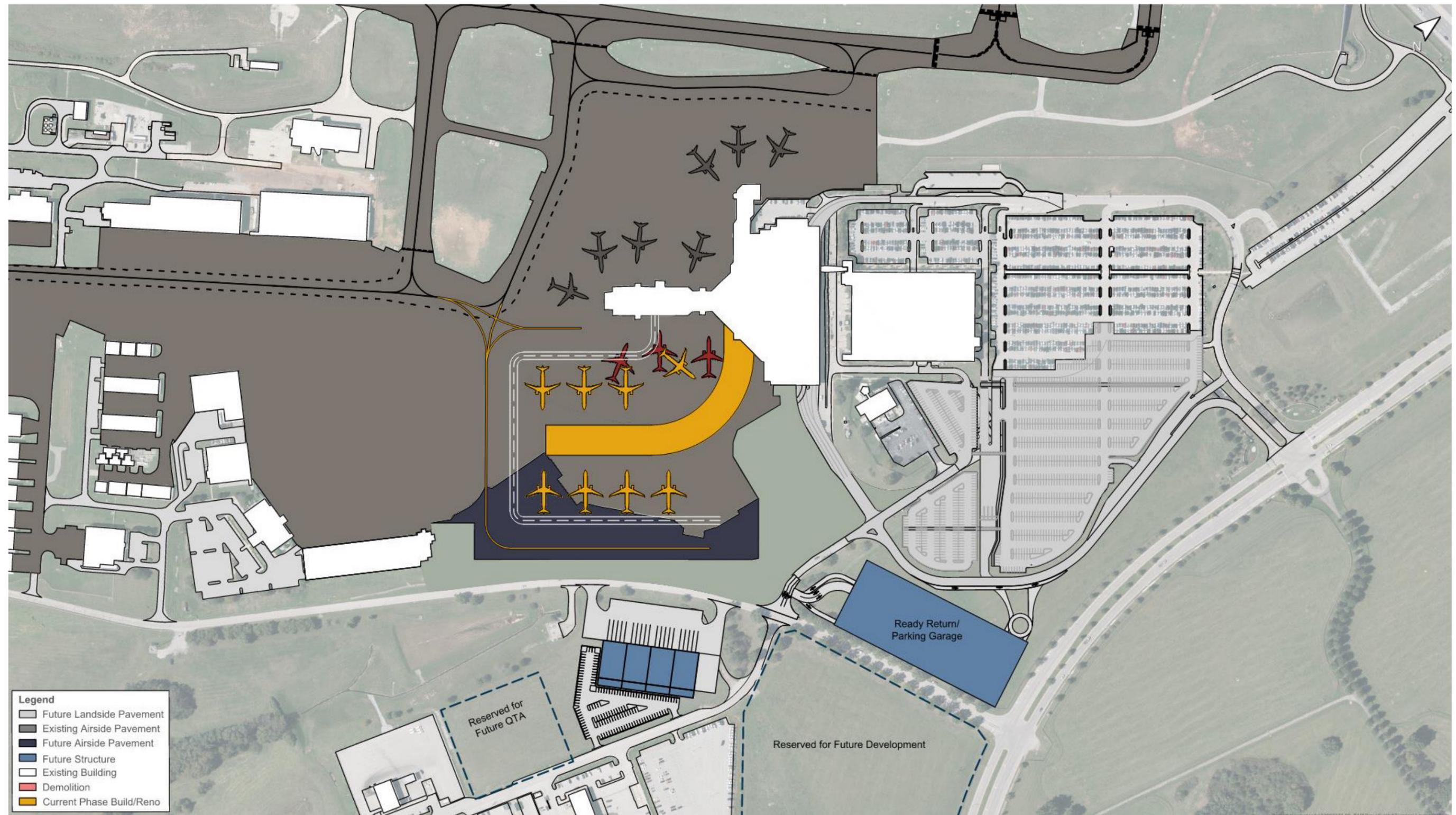
The anticipated duration of construction activities to complete phase three work is 12 months. **Exhibit 5.4-4, Hybrid Concept Phase IV**, presents the recommendations of Phase IV.

Exhibit 5.4-1 – Hybrid Concept Phase IIA



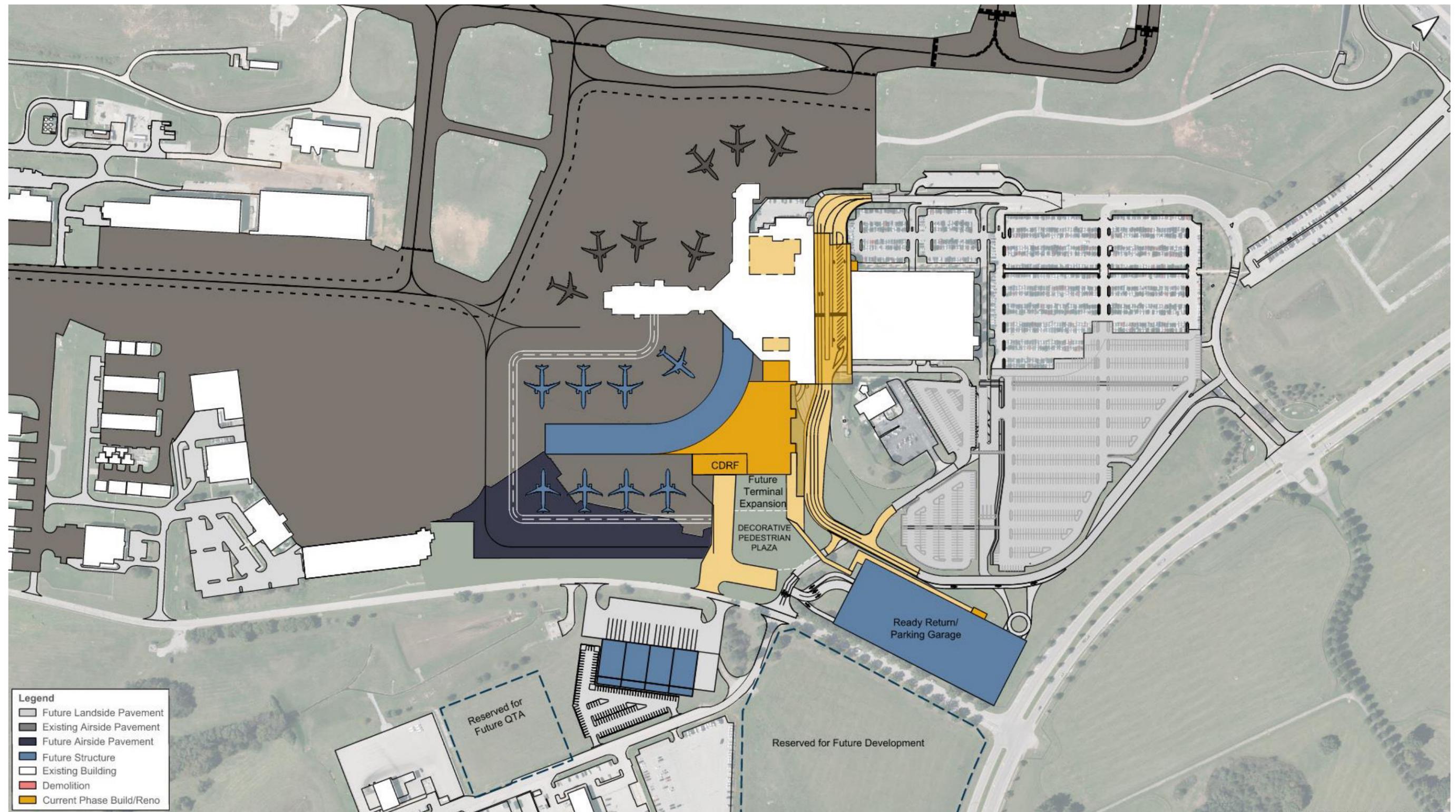
Source: CMT, Alliance, WSP

Exhibit 5.4-2 – Hybrid Concept Phase IIB



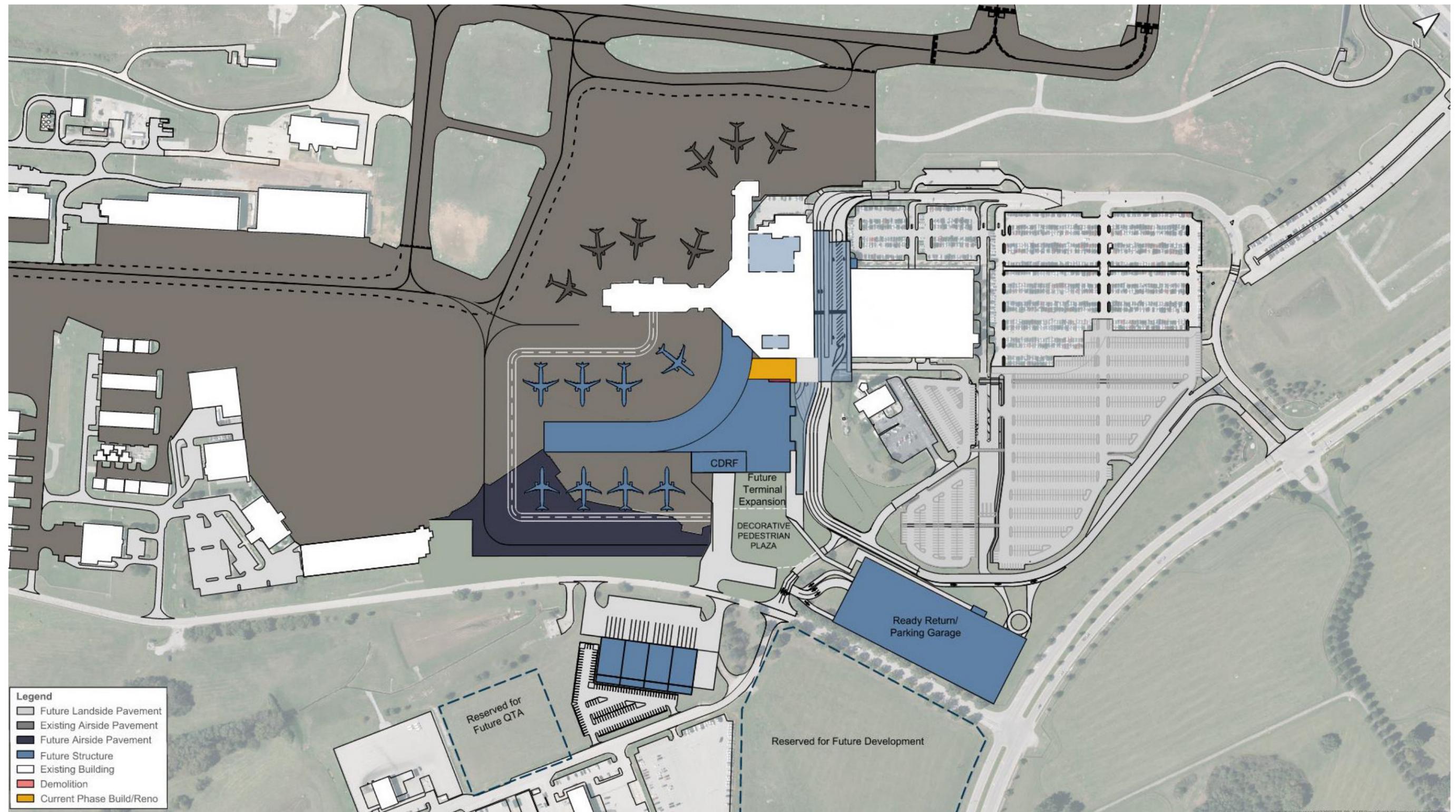
Source: CMT, Alliance, WSP

Exhibit 5.4-3 – Hybrid Concept Phase III



Source: CMT, Alliance, WSP

Exhibit 5.4-4 – Hybrid Concept Phase IV



Source: CMT, Alliance, WSP

5.4.4 Phase V

The fifth phase of construction includes the construction of a new checked baggage screening room at the apron level of the concourse expansion. The new checked baggage system will allow the existing system to be taken offline and demolished in future phases.

Two skybridges are also constructed in phase 5. The first is a skybridge connector between the concourse expansion and existing Concourse B which will allow Concourse B to be partially separated from the headhouse. Though separated, the concourse connector maintains access from the security screening checkpoint to all gates to the exit to baggage claim. The second skybridge connects the terminal headhouse to the existing parking garage at the mezzanine level. A newly expanded vertical circulation tower is also constructed at the existing parking garage.

Finally, the next section of the existing terminal headhouse is demolished and rebuilt in-line with the previously built section. The new expansion area includes expanded ticketing and check-in counter areas.

The anticipated duration of construction activities to complete phase three work is 12 months. **Exhibit 5.4-5, Hybrid Concept Phase V**, presents the recommendations of Phase V.

5.4.5 Phase VI

The sixth phase of construction includes the demolition of the next section of the terminal headhouse at the intersection of the existing headhouse and previous concourse expansion.

A second concourse skybridge connector at the concourse level is constructed between existing Concourse A and B. The connector is necessary to facilitate the separation of the terminal headhouse and Concourse B. In addition to the headhouse, the section of new construction includes portions of new concourse at the upper level.

Circulation from the security screening checkpoint to the new concourse expansion will flow via the Concourse A/B connector through Concourse B.

The anticipated duration of construction activities to complete phase three work is 12 months. **Exhibit 5.4-6, Hybrid Concept Phase VI**, presents the recommendations of Phase VI.

5.4.6 Phase VII

The seventh phase of construction includes the demolition of a portion of the terminal headhouse and connection to Concourse B. After the initial demolition, all passenger circulation between the security screening checkpoint, concourses, and exit to landside and baggage claim.

The new construction includes both terminal headhouse and concourse functions. To facilitate the next phase of construction, the security screening checkpoint will be relocated into the new construction. The initial security screening checkpoint layout will be temporary until the next section of the terminal headhouse and concourse are constructed. Vertical circulation from the checkpoint to the concourse is also part of the new construction.

The anticipated duration of construction activities to complete phase three work is 12 months. **Exhibit 5.4-7, Hybrid Concept Phase VII**, presents the recommendations of Phase VII.

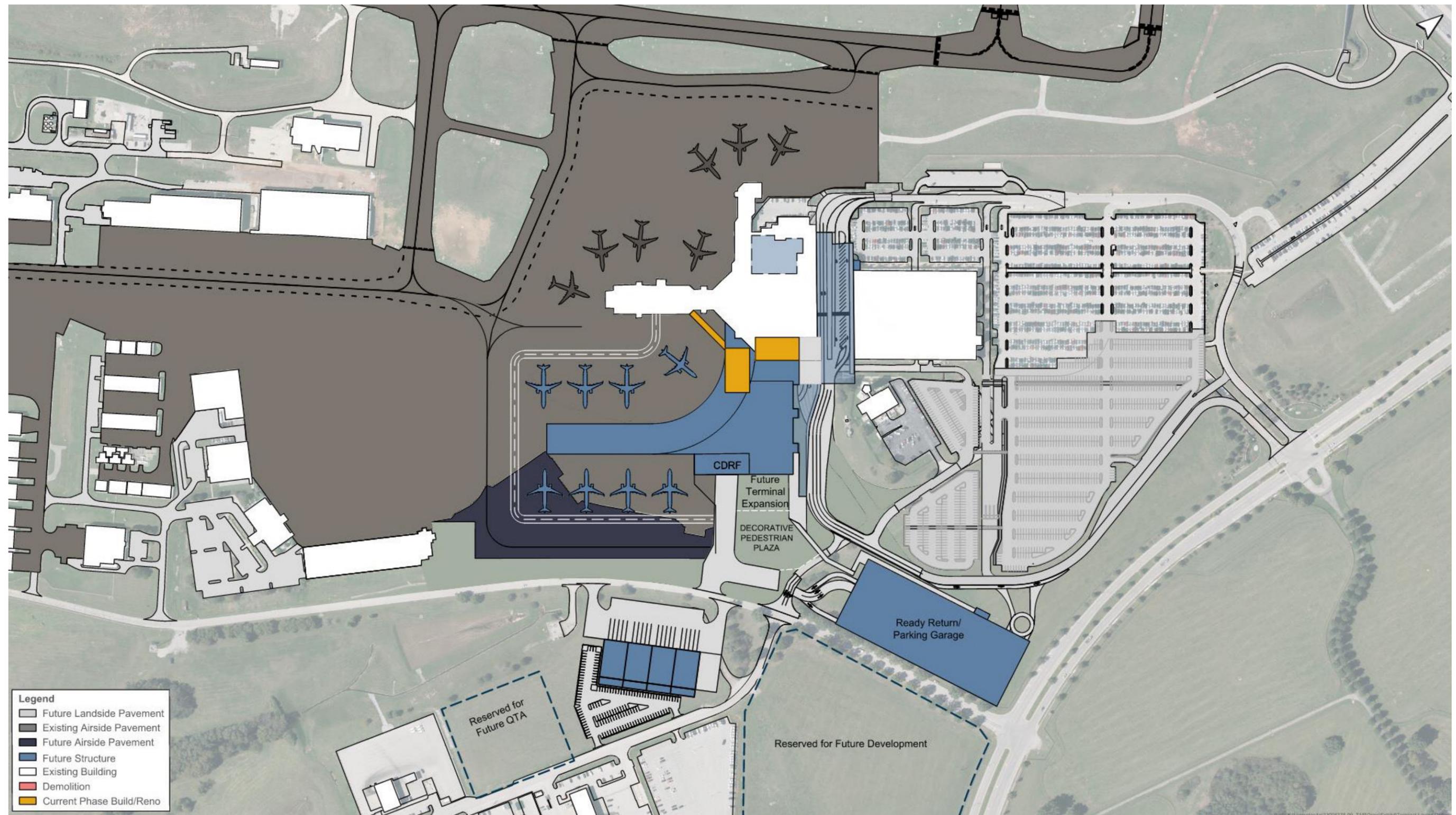
5.4.7 Phase VIII

The eighth phase of construction includes the demolition of the final section of the terminal headhouse while maintaining Concourse A. The demolition allows for the construction of the final section of the terminal headhouse and reconfiguration of the security screening checkpoint into the final location and configuration.

One of the existing Concourse A aircraft positions is shifted and realigned into the final location and configuration.

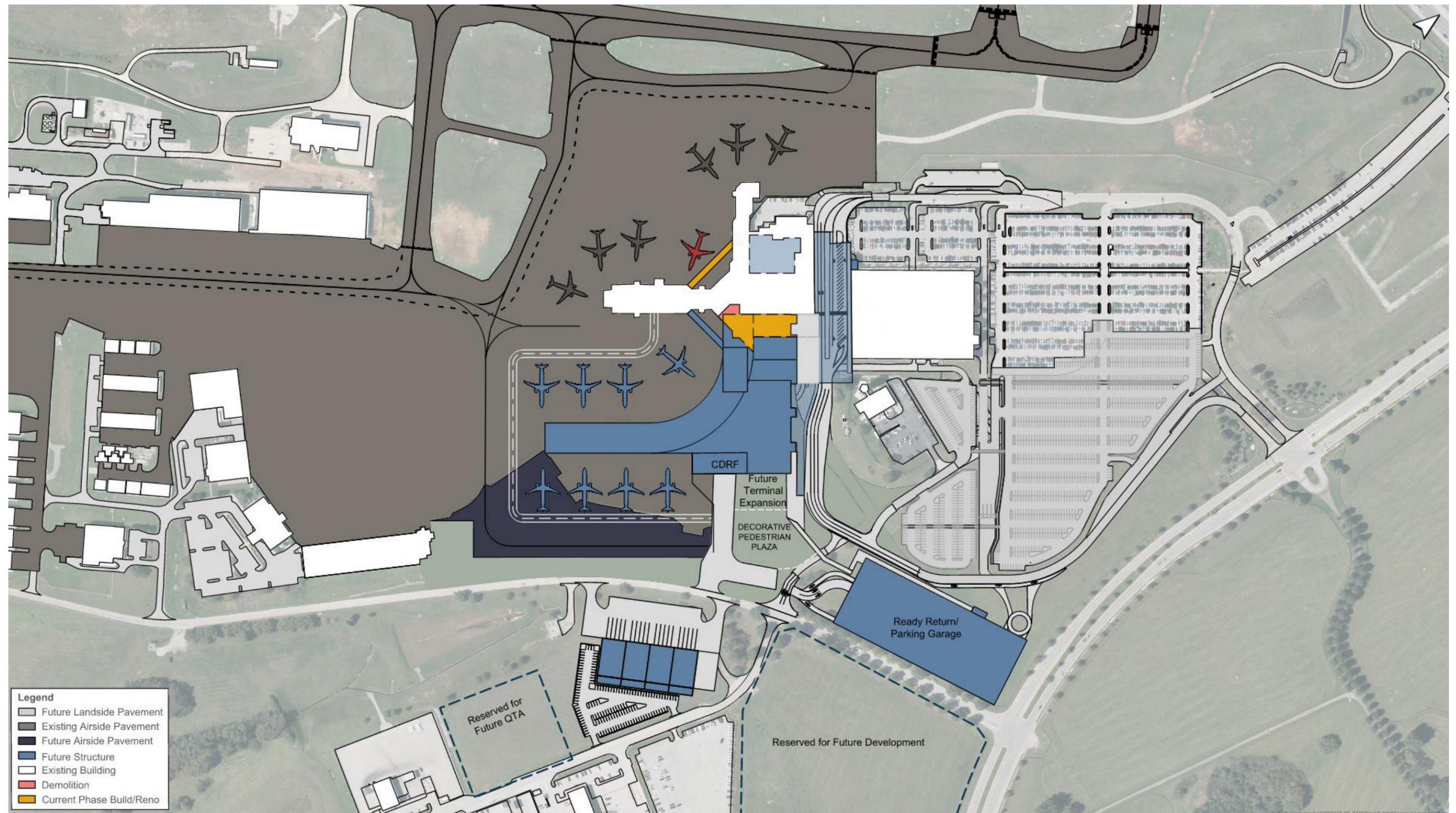
The anticipated duration of construction activities to complete phase three work is 12 months. **Exhibit 5.4-8, Hybrid Concept Phase VIII**, presents the recommendations of Phase VIII.

Exhibit 5.4-5 – Hybrid Concept Phase V



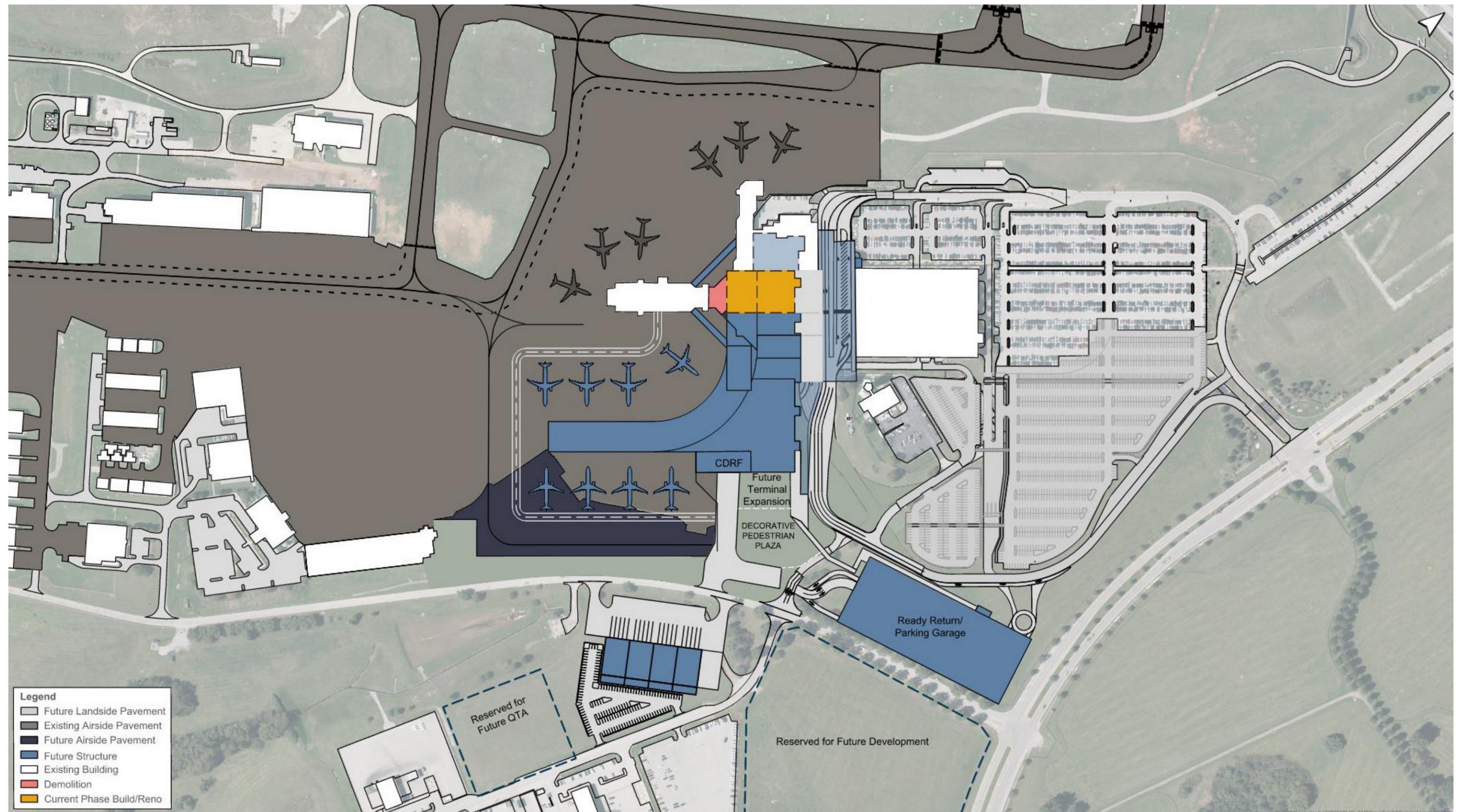
Source: CMT, Alliance, WSP

Exhibit 5.4-6 – Hybrid Concept Phase VI



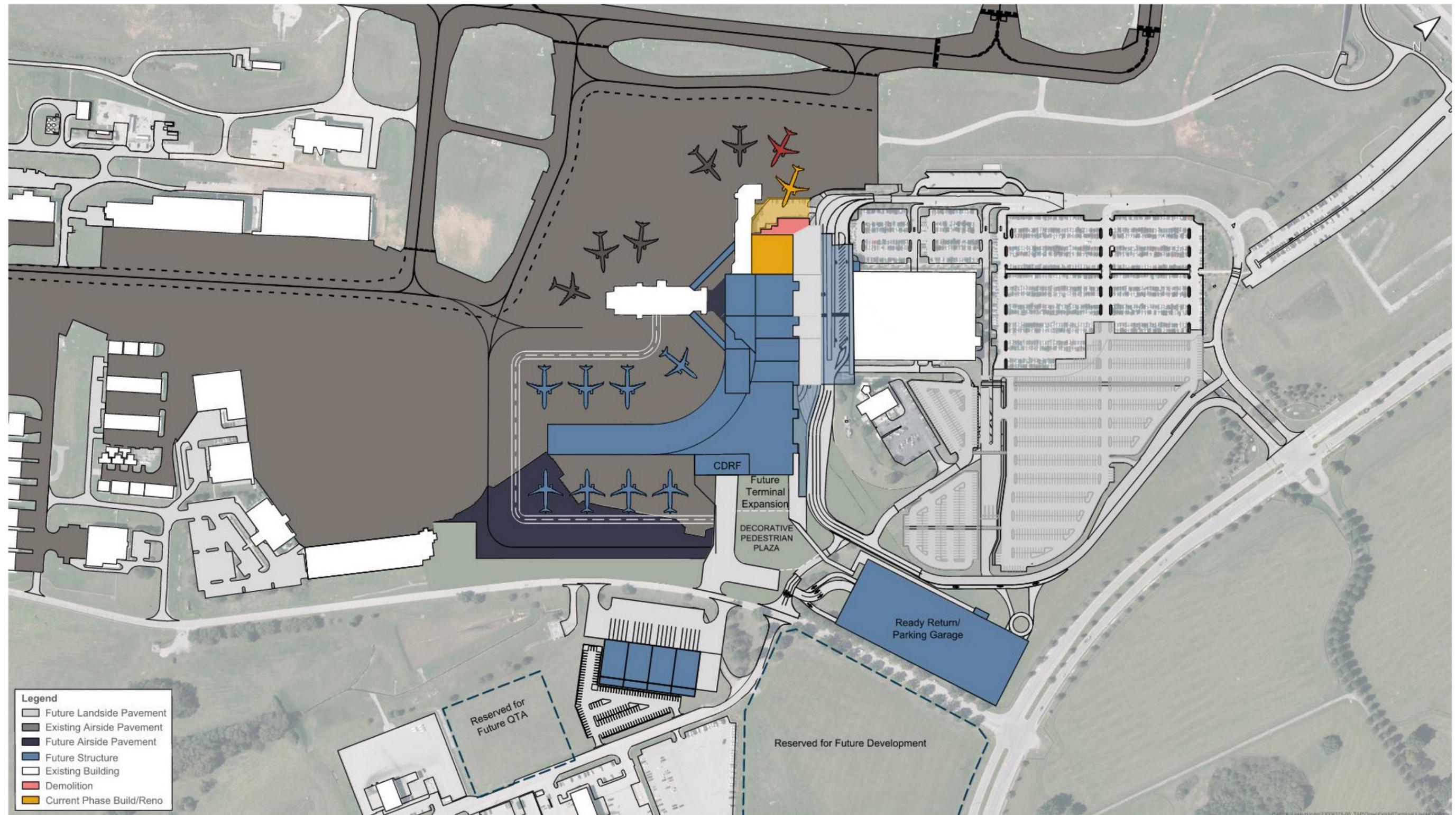
Source: CMT, Alliance, WSP

Exhibit 5.4-7 – Hybrid Concept Phase VII



Source: CMT, Alliance, WSP

Exhibit 5.4-8 – Hybrid Concept Phase VIII



Source: CMT, Alliance, WSP

5.4.8 Phase IX

The ninth phase of construction includes the demolition of Concourse A to facilitate the construction of the final section of the terminal reconstruction. The final section includes concourse level gate holdroom space and two passenger boarding bridges.

It should be noted that gate capacity will be reduced for a significant portion of Phase IX while Concourse A is demolished, the terminal apron is reconstructed, and two new passenger boarding bridges are installed. In addition, site work can be accomplished for the RON apron expansion during Phase IX; however, should the gate capacity be required during construction of the Phase IX terminal expansion, the RON Apron could be implemented at an earlier phase to allow for use as remote positions during this time of reduced contact gate positions.

The anticipated duration of construction activities to complete phase three work is 12 months. **Exhibit 5.4-9, Hybrid Concept Phase IX**, presents the recommendations of Phase IX.

5.4.9 Phase X

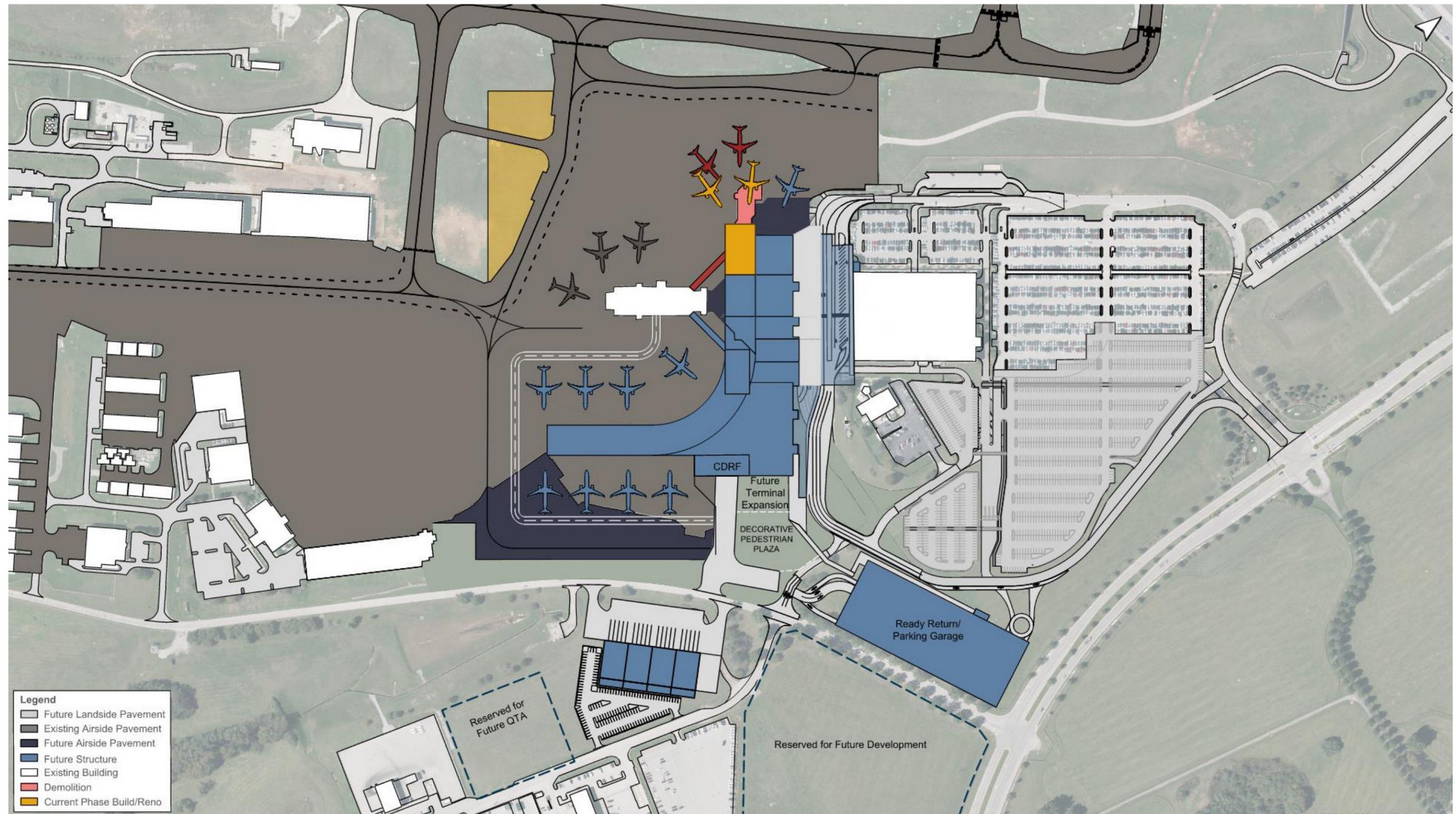
The tenth and final phase of construction includes the demolition of the remaining portion of Concourse B and the temporary connectors built in earlier phases. As part of the concourse demolition a significant portion of the existing terminal apron will be demolished and reconstructed to tie into adjacent apron areas which may have been reconstructed in previous phases. After the terminal apron is reconstructed, the final three passenger boarding bridges can be placed at gates 10, 11, and 12.

The reconstruction of the terminal apron will allow for restriping of vehicle service roads and parallel taxilanes along the length of the new concourse. The addition of the parallel taxilanes will allow for the striping and activation of the remaining remote aircraft parking / deicing positions.

On the landside, remaining roadway and curbside improvements will be completed. An additional parking garage is also constructed to the east of the existing parking garage.

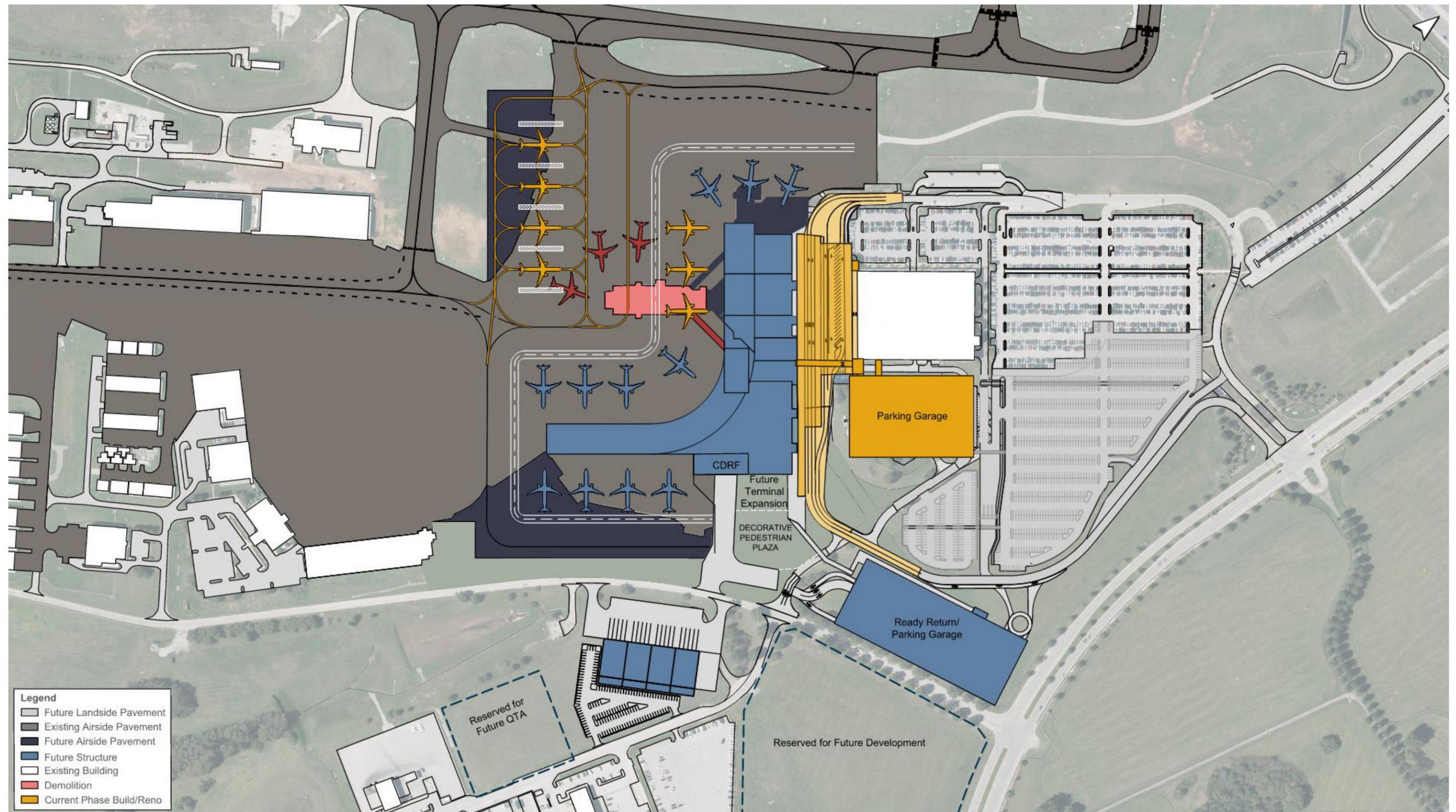
As noted in Phase IX, gate capacity will be reduced for a significant portion of Phase X while Concourse B is demolished, the terminal apron is reconstructed, and the remaining passenger boarding bridges are installed. **Exhibit 5.4-10, Hybrid Concept Phase X**, presents the recommendations of Phase X.

Exhibit 5.4-9 – Hybrid Concept Phase IX



Source: CMT, Alliance, WSP

Exhibit 5.4-10 – Hybrid Concept Phase X



Source: CMT, Alliance, WSP

5.5 Phasing Summary

5.5.1 Block Plan Considerations (Concept 4 vs. Hybrid Concept)

Each of the concepts for the terminal replacement program are nearly identical through the completion of Phase II. The new concourse expansion, built in Phase IIB, includes programmatic differences that are a direct result of future phases. The end of Phase IIB represents a decision point whether to proceed with Concept 4 or the Hybrid Concept. The following are key programmatic differences and/or considerations between the two concepts. While these programmatic differences do differentiate the concepts as they exist at this level of planning, further planning and design may allow the programmatic differences to be more similar than they are different through future conceptual and phasing refinement.

Impact on Existing Terminal Operations

The most significant difference between the preferred concepts is the impact on existing terminal headhouse operations throughout the phasing of the terminal replacement program.

Phase III of the Hybrid Concept represents a smaller and focused baggage claim expansion followed by incremental demolition and reconstruction of the terminal headhouse. The phased demolition and construction may have a significant impact on terminal headhouse functions and operations as well as passenger flow and experience during construction.

Phase III of Concept 4 represents a two-level terminal headhouse program that replaces the existing terminal headhouse functions and operations entirely. By the end of Phase III all passenger processing (departures, screening, and arrivals) and terminal headhouse operations are accommodated within the new structure. The existing terminal headhouse can be demolished in less phases with minimal impact on terminal headhouse functions and operations as well as passenger flow and experience during construction.

Future Headhouse Expansion

The Hybrid concept includes all processing functions on a single level, while Concept 4 includes ticketing and baggage claim on the lower level and passenger security screening on the upper level. This results in a smaller terminal headhouse footprint in Concept 4 when compared to the footprint of the Hybrid Concept.

While area has been identified in the block plan diagrams for future expansion in the Hybrid Concept, the area is limited when compared to Concept 4.

FIS Location

The location of the Federal Inspections Services (FIS) block is also notable. In the Hybrid Concept, the FIS is located below the Concourse Expansion in Phase IIB, while the FIS is located under the concourse in the future phase concourse replacement.

The Hybrid Concept would allow for the FIS to be built and operational sooner in the overall terminal replacement program.

SSCP Location & Commercial Program Node

The location and sequencing of the new SSCP is also a consideration between the two concepts. The Hybrid Concept creates a new SSCP through a series of smaller expansions. To sequence the new construction, the orientation of the security screening checkpoint changes through the duration of the terminal replacement program.

Concept 4 relocates the existing terminal functions and operations into Phase III construction including the SSCP. A new SSCP is created without the need to phase or change the orientation of passenger screening through the construction duration.

The SSCP is located on the upper level in Concept 4 which means departing passengers coming from the ticketing and checkpoint area will circulate up to the SSCP. The upper-level location allows for direct access, bypassing ticketing and check-in functions via a skybridge, for passenger who may have parked in the garage. In the Hybrid concept all passengers will need to circulate down to the lower level to access the SSCP.

The location of the SSCP in Concept 4 is also more centrally located to gate holdrooms and passenger boarding. Based on the programmatic requirements and aircraft holdroom layout, a larger centralized commercial node can be created directly opposite the exit from the SSCP. The larger centralized commercial node could include more specialized retail units which rely on maximum exposure to passengers.

Table 5.5-1 – Terminal Phasing Summary

Functional Characteristic	Phase I	Phase II	Phase III	Phase IV	Phase V	Phase VI	Phase VII	Phase VIII	Phase IX	Phase X
<i>Concept 4</i>										
Approximate Gross Terminal Area (SF)	213,500	343,800	519,300	367,200	455,500	381,700	382,000	-	-	-
Ticket Counters	25	25	43	18	18	18	18	-	-	-
Security Screening Checkpoints	3	3	4	4	4	4	4	-	-	-
Baggage Claim Devices	2 / 230 LF	2 / 230 LF	3 / 480 LF	-	-	-				
Aircraft Gates	4	15	15	14	12	12	14	-	-	-
RON Positions	-	-	-	-	-	-	4	-	-	-
Approximate Curbfront (LF)	525	525	680	680	680	680	800	-	-	-
Ground Transportation Center (stalls)	-	-	26	26	26	26	26	26	26	26
<i>Hybrid Concept</i>										
Approximate Gross Terminal Area (SF)	213,500	384,000	482,900	482,900	478,600	475,000	472,700	454,200	429,200	342,700
Ticket Counters	25	25	37	31	28	26	18	18	18	18
Security Screening Checkpoints	3	3	4	4	4	4	4	4	4	4
Baggage Claim Devices	2 / 230 LF	2 / 230 LF	3 / 480 LF							
Aircraft Gates	10	15	15	15	15	14	14	14	14	14
RON Positions	-	-	-	-	-	-	-	-	-	4
Approximate Curbfront (LF)	525	525	680	680	680	680	680	680	680	870
Ground Transportation Center (stalls)	-	-	24	24	24	24	24	24	24	26

Source: CMT, Alliance, WSP

5.6 Cost Estimates

The Rough Order of Magnitude (ROM) cost estimates were developed to provide a high-level assessment of the potential construction costs based on the preliminary programmatic, blocking plan, and site information. At this stage, the ROM estimates are intended to be a tool to guide early decision making, establish budget expectations, and generally evaluate the project feasibility.

The ROM estimates are derived from industry-standard unit cost data and benchmarks for similar project types and scope of work. The cost data presented is reflective of current year’s construction costs and gross floor areas, building typology, site information, and regional construction industry factors. At this stage, the ROM cost estimate is not based on detailed design information.

The terminal replacement project is intended to be delivered in multiple construction phases to allow flexibility and respond to funding availability, operational continuity, and/or logistical constraints. For the ROM estimate, a five percent (5%) phasing premium has been added to account for increased costs due to extended general conditions, additional mobilization/demobilization frequency, and potential inefficiencies in labor and materials procurement.

To attempt to accommodate anticipated increases in labor, materials, and equipment costs, a cost escalation factor has also been applied. Based on recent economic trends, the annual escalation rate applied to the ROM estimate is 3.6 percent per year. Escalation has been calculated from the anticipated start of construction to the mid-point of construction. For the ROM estimate the escalation factor assumes limited down time between phases. The escalation estimate can be refined as the project schedule is further developed.

Given the planning nature of the study, a design contingency allowance of 20 percent has been included in the ROM estimate. The design contingency allowance is intended to account for unforeseen conditions and detailed design refinement and evolution. A 15 percent allowance has also been included to account for design and engineering costs for the project.

Table 5.6-1, ROM Cost Estimates by Phase, presents the ROM cost estimates by Phase for both Concept 4 and the Hybrid Concept. **Table 5.6-2, ROM Cost Estimates – Parking Needs**, presents the ROM cost estimates for the recommended parking structures that are considered outside the Terminal and Landside Curbfront Program and are likely to be funded via separate sources.

Table 5.6-1 – ROM Cost Estimates by Phase

Terminal Program Phase	Concept 4	Hybrid Concept
Phase I	\$29,000,000	\$29,000,000
Phase II (excludes Rental Ready/Return Facility)	\$271,500,000	\$271,500,000
Phase III	\$232,500,000	\$151,400,000
<i>Subtotal through Phase III</i>	<i>\$533,000,000</i>	<i>\$451,900,000</i>
Phase IV	\$18,100,000	\$14,800,000
Phase V	\$163,900,000	\$50,900,000
Phase VI	\$7,000,000	\$58,900,000
Phase VII	\$7,000,000	\$80,300,000
Phase VIII	-	\$41,500,000
Phase IX	-	\$50,900,000
Phase X	-	\$26,300,000
Total Terminal & Landside Curb Program	\$729,000,000	\$775,500,000

Source: Alliance, Vistara

Table 5.6-2 – ROM Cost Estimates – Parking Needs

Parking Needs	Concept 4	Hybrid Concept
Rental Ready/Return Facility + 1,000 Public Parking Spaces (2030-2040 Facility Requirements)	\$101,900,000	\$101,900,000
Public Parking Garage – 1,000 spaces (2040 & beyond Facility Requirements)	\$155,900,000	\$155,900,000
Total Terminal & Landside Curb Program	\$257,800,000	\$257,800,000

Source: WSP

Section Six

Financial Strategy & Modeling

6.1 Financial Strategy

The financial review and analysis conducted as part of the TAP planning process established a clear and actionable framework to guide funding and affordability decisions as the program moves toward implementation. The overarching goal of this effort was to ensure that LEX maintains a cost-effective, competitive, and financially resilient operating environment while pursuing its long-term strategic objectives. The analysis was designed to develop an achievable and sustainable funding roadmap that would allow the airport to meet current and future capital needs without compromising its fiscal stability or stakeholder relationships.

Specific elements of the financial analysis are presented in **Table 6.1-1, Financial Modeling Approach**.

Table 6.1-1– Financial Modeling Approach

Task	LEX Objectives	Approach Taken
Developed Financial Scenarios	<ul style="list-style-type: none"> Maintain affordable airline rates and charges Meet other financial targets Minimize debt load Optimize use of funding sources Maintain credit rating 	<ul style="list-style-type: none"> Evaluated all potential funding sources for capital projects including debt, retained earnings, pay/go CFCs and PFCs, grants, and third-party capital Reviewed PFC and CFC programs and future capacity Determined availability of funding sources in context of construction phasing plan Evaluated debt capacity and coordinated with LEX municipal advisor
Conducted Financial Modeling and Quantitative Analytics	<ul style="list-style-type: none"> Identify financial implications of alternative program phasing and funding plans Minimize sensitivity of results to “stress test” assumptions Provide projections of future operating expenses and revenues and impacts of capital asset life cycle costs Maintain competitive CPE as compared to LEX peer airports Ensure robust working capital and liquidity levels 	<ul style="list-style-type: none"> Prepared cash flow scenarios Evaluated impacts of events such as traffic shocks, economic downturns, and other disruptions Modeled pro forma projections of rates and charges, airline revenues, nonairline revenues, operating expenses, debt service and other financial requirements under the current rate-making methodology, CIP options, air traffic activity, and other scenarios to evaluate their effects on key metrics such as debt service coverage, liquidity, and CPE Developed a long-range forecasting model to evaluate the financial implications of the various options for delivering the TAP

Source: Frasca

The process began with a comprehensive financial assessment and planning phase focused on understanding LEX's existing financial position and capacity. This included a detailed review of debt obligations, reserve requirements, management policies, and statutory or regulatory constraints affecting funding structures. The team examined all active and potential funding mechanisms—such as Passenger Facility Charges (PFCs), Customer Facility Charges (CFCs), federal and state grants, retained earnings, and third-party capital contributions—to determine their availability and flexibility in supporting the TAP. Financial data covering fiscal years 2019 through 2023, including cash balances, financial statements, and trial balance details, was analyzed to establish a clear baseline of financial performance. From there, the financial capacity evaluation assessed LEX's ability to support upcoming capital projects under varying market conditions, with sensitivity tests conducted to measure the effects of traffic fluctuations and other economic factors on revenue and liquidity.

In collaboration with LEX management, a set of internal and external financial objectives was then developed to guide decision-making throughout the TAP implementation. Internally, the objectives focused on maintaining a strong financial position, optimizing all available funding sources, minimizing the impact on key financial metrics such as debt service coverage and days cash on hand, and protecting the airport's credit rating. Maintaining financial flexibility and resiliency was emphasized to ensure preparedness for unexpected events such as airline withdrawals, economic downturns, or policy changes. Externally, the airport aimed to preserve cost efficiency across all stakeholder groups, including airlines, passengers, general aviation users, and concessionaires. This meant closely monitoring and managing the impact of project funding decisions on landing fees, terminal rents, passenger charges, and other customer-related costs.

Following the establishment of financial objectives, multiple funding and phasing scenarios were developed and evaluated. Each scenario was analyzed to determine its affordability and sustainability based on projected revenues, debt capacity, and available grant funding. Detailed financial modeling was performed to forecast future operating revenues and expenses, debt service requirements, and capital funding needs. The analysis included sensitivity testing to measure potential impacts from traffic declines, inflationary pressures, and broader economic disruptions. These models allowed LEX to compare the implications of various funding approaches on key financial metrics, including Cost per Enplaned Passenger (CPE), debt coverage, and liquidity. Through this process, initial funding gaps were identified, and strategies were developed to close those gaps through timing adjustments, phased delivery, or alternative funding sources. Financial metrics and scenario outcomes served as the primary decision-making tools for evaluating project affordability and overall program feasibility.

As the analysis progressed, it became clear that LEX, like many small-hub airports experiencing growth, faced upward pressure on CPE and limited flexibility in generating unrestricted cash flows. Forecasts indicated that traditional funding sources alone would not fully support the anticipated program costs, reinforcing the need for a diversified funding strategy that includes debt financing, grant opportunities, and creative funding partnerships. Additionally, the federal Rates and Charges policy restricts full terminal cost recovery in the absence of certain agreements, further underscoring the importance of strategic financial planning. To support this process, comparative analyses of debt metrics across similar airports were conducted, and high-level debt capacity assessments were completed. LEX's rate-setting methodologies were reviewed to understand their implications for future funding options, and internal planning tools were developed to enable ongoing financial evaluation of each funding scenario.

Looking ahead, the focus will be on refining the optimal funding mix and ensuring continued affordability as the TAP progresses. This will involve prioritizing funding sources that balance financial flexibility with cost efficiency, continuously monitoring financial performance as conditions evolve, and maintaining open communication with airlines and stakeholders to ensure transparency and alignment. Regular updates to financial models will allow for proactive adjustments in response to cost changes, market shifts, or new funding opportunities. LEX will also continue to evaluate the effects of financing decisions on long-term operational and financial metrics, ensuring that the airport remains well-positioned to adapt to future challenges.

The next steps in this process include finalizing the preferred funding strategy based on updated cost estimates and construction phasing, engaging with funding partners and grant agencies, and validating financial projections through independent review and stress testing. Documentation will be prepared to support potential bond issuances or other financing actions, and financial monitoring tools will be integrated into TAP management practices to track progress and maintain accountability.

In summary, this financial roadmap provides a structured, iterative process for securing funding and ensuring the affordability of TAP implementation. By aligning strategic objectives, financial capacity, and stakeholder needs, LEX is establishing a disciplined and forward-looking framework that supports both the successful delivery of the TAP and the airport's long-term fiscal sustainability.

Section Seven

Program Implementation Roadmap

7.1 Implementation Roadmap

The development of the implementation roadmap for the TAP program marked a critical step in transitioning from conceptual planning to actionable strategy. To effectively visualize and communicate the recommended phasing and delivery of both Concept 4 and the Hybrid Concept, the TAP team created detailed Gantt charts. These charts are intended to serve as dynamic tools to map out the sequence and timing of major project milestones, dependencies, enabling projects, and decision points, ensuring that all stakeholders can clearly understand the progression of the Terminal Program at LEX.

Each Gantt chart was organized into two distinct segments. The first segment, spanning from initialization through Phase IIA, is identical for both Concept 4 and the Hybrid Concept. This phase included foundational activities such as project mobilization, stakeholder engagement, preliminary design, and early procurement and permitting processes. The end of this first segment of the Gantt chart identifies the decision point for the Airport of embarking upon the development of either Concept 4 or the Hybrid Concept.

The second segment of the Gantt charts, encompassing Phase IIB through the full buildout of the program, highlights the divergence in implementation between Concept 4 and the Hybrid Concept. At this stage, the roadmap reflected the unique requirements, sequencing, and operational impacts associated with each concept.

The resulting implementation roadmaps are intended to provide the foundation for advanced program management and planning. By clearly delineating the shared and distinct phases of each concept, the Gantt charts support informed decision-making, risk mitigation, and proactive coordination among project teams to the extent possible at this time. This structured approach is designed to guide the successful execution of the overall Terminal Program at LEX.

Exhibit 7.1-1 through Exhibit 7.1-7, present the Program Implementation Roadmap Gantt Charts for both Concept 4 and the Hybrid Concept.

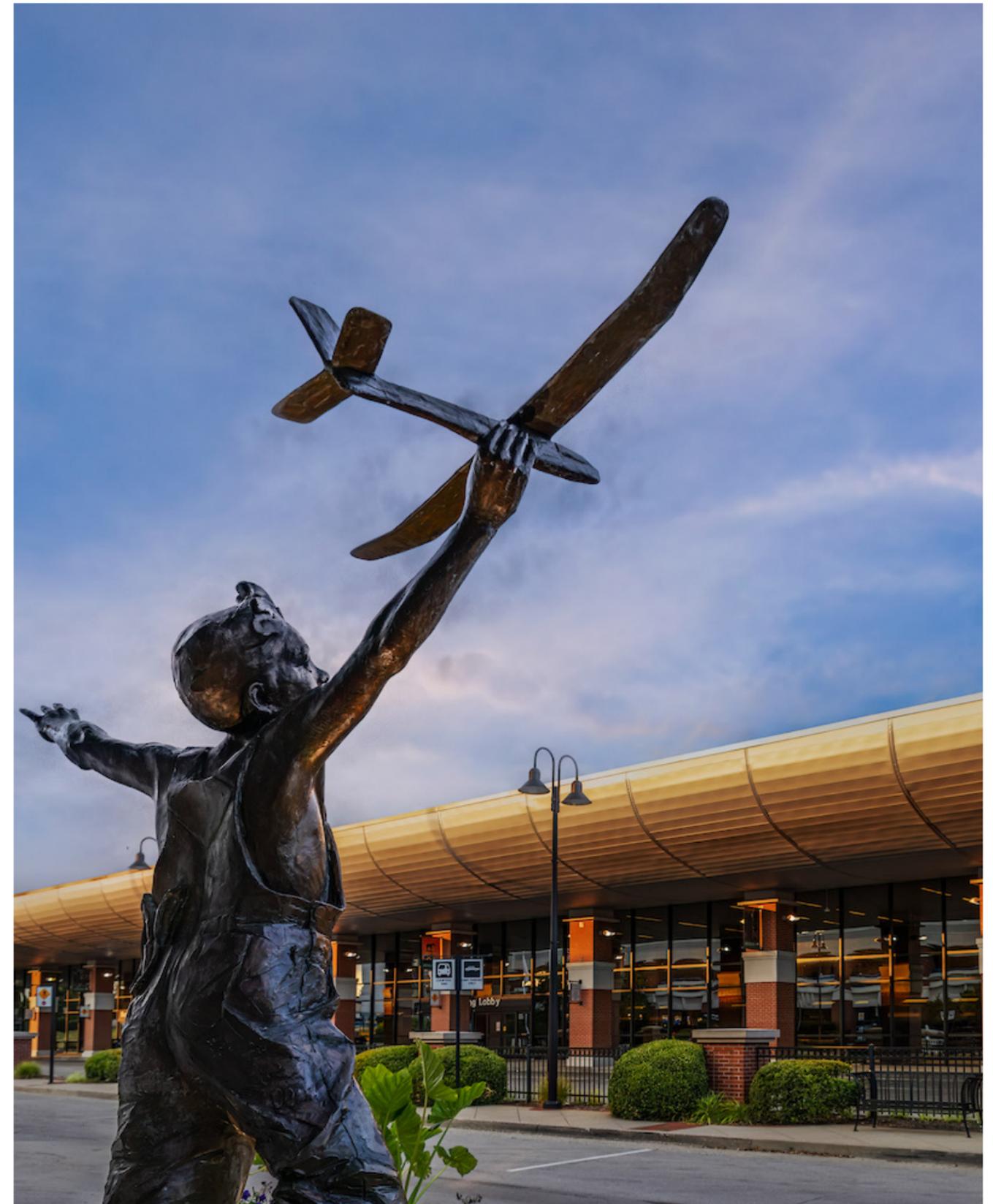
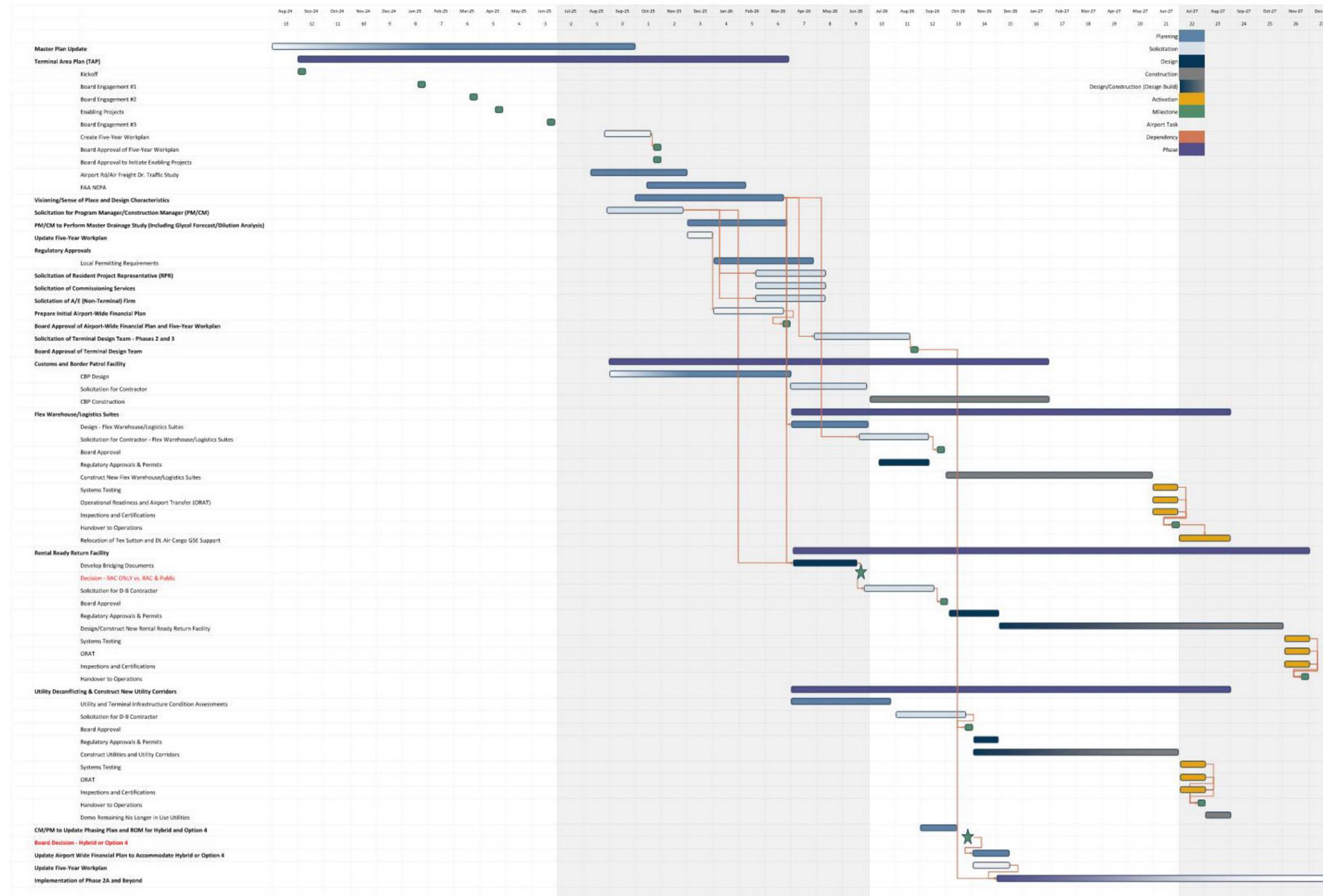
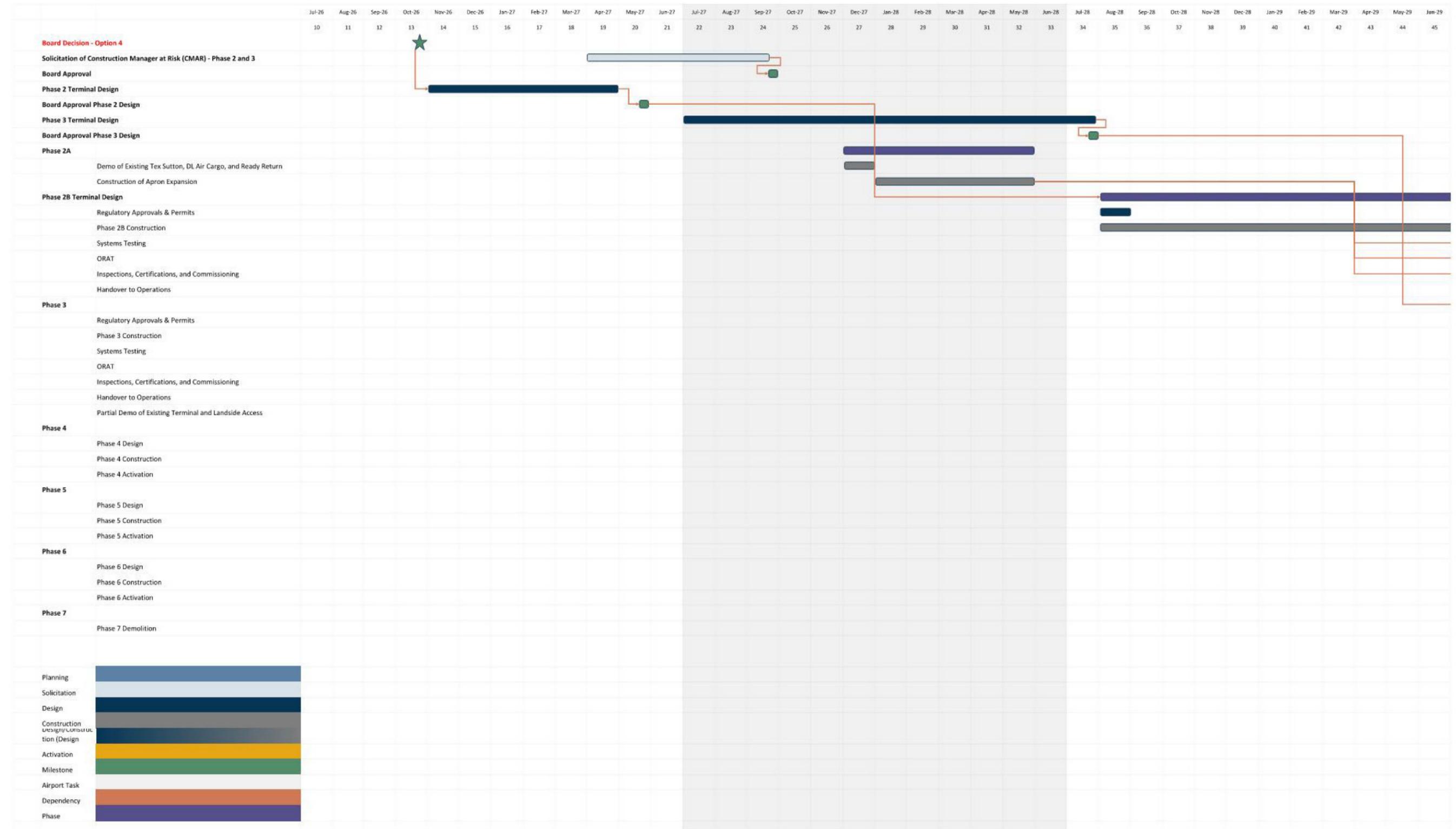


Exhibit 7.1-1 – Program Implementation Roadmap (Initialization to Phase IIA)



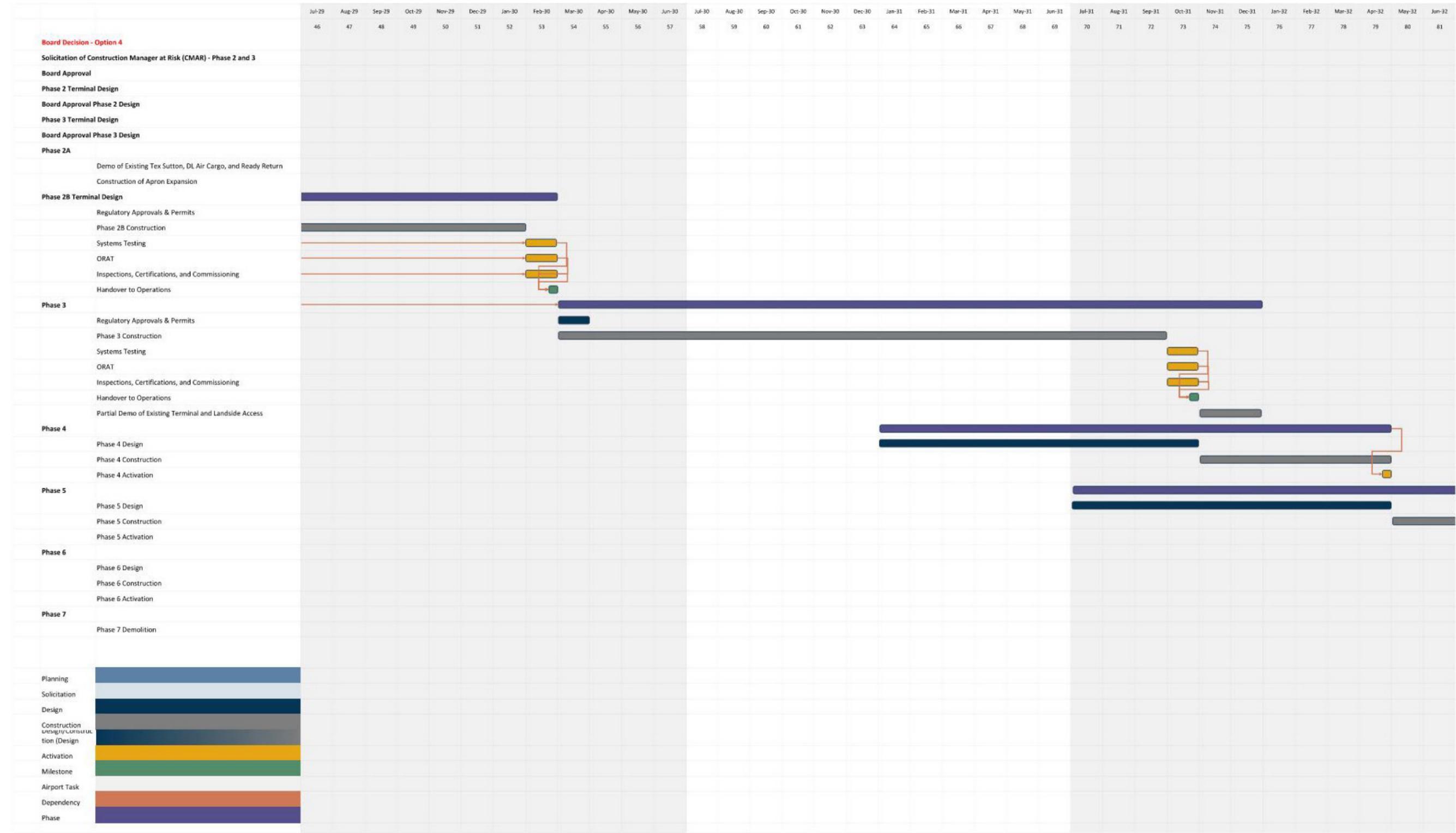
Source: CMT, Alliance, WSP

Exhibit 7.1-2 – Program Implementation Roadmap – Concept 4 (Page 1)



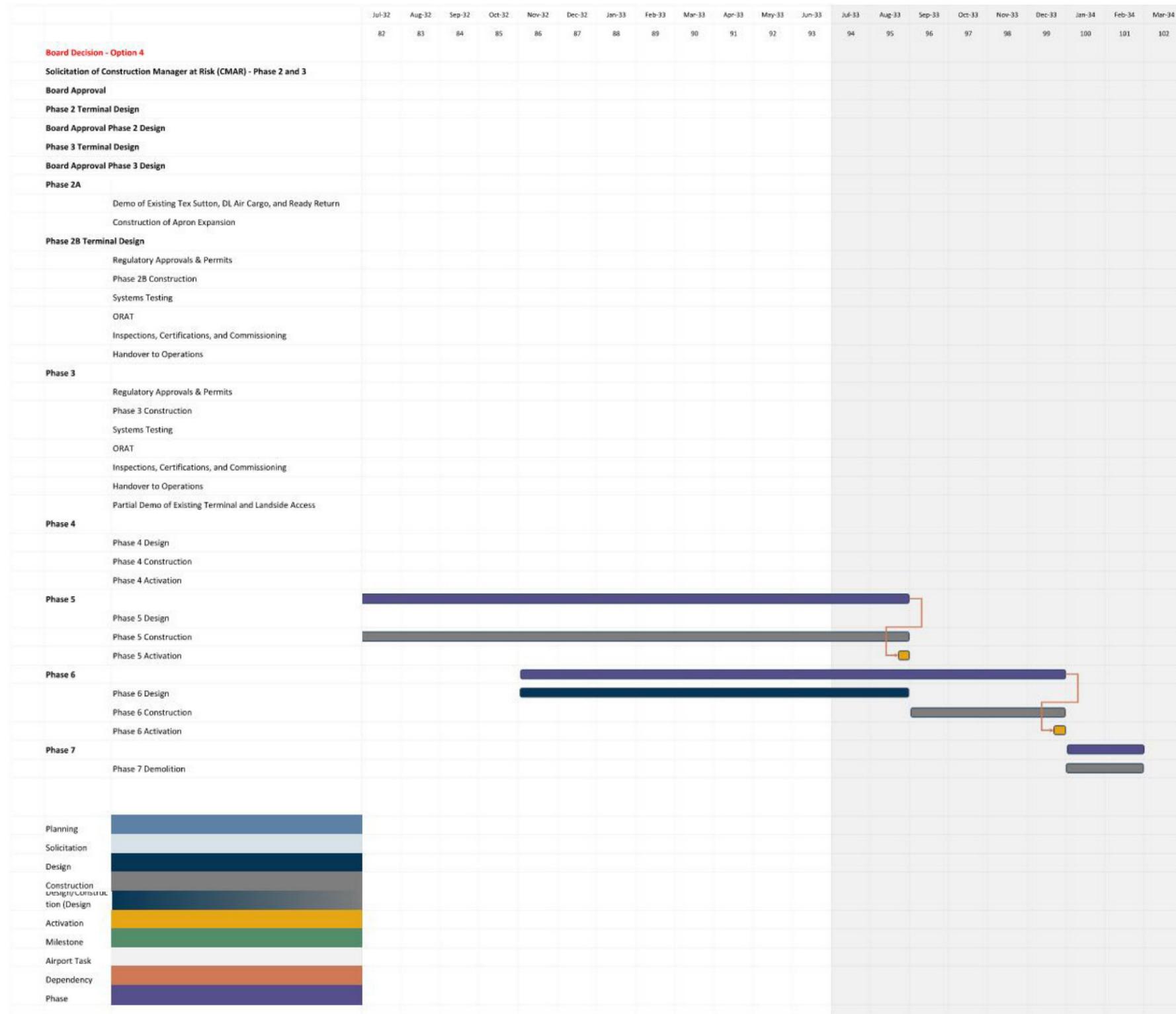
Source: CMT, Alliance, WSP

Exhibit 7.1-3 – Program Implementation Roadmap – Concept 4 (Page 2)



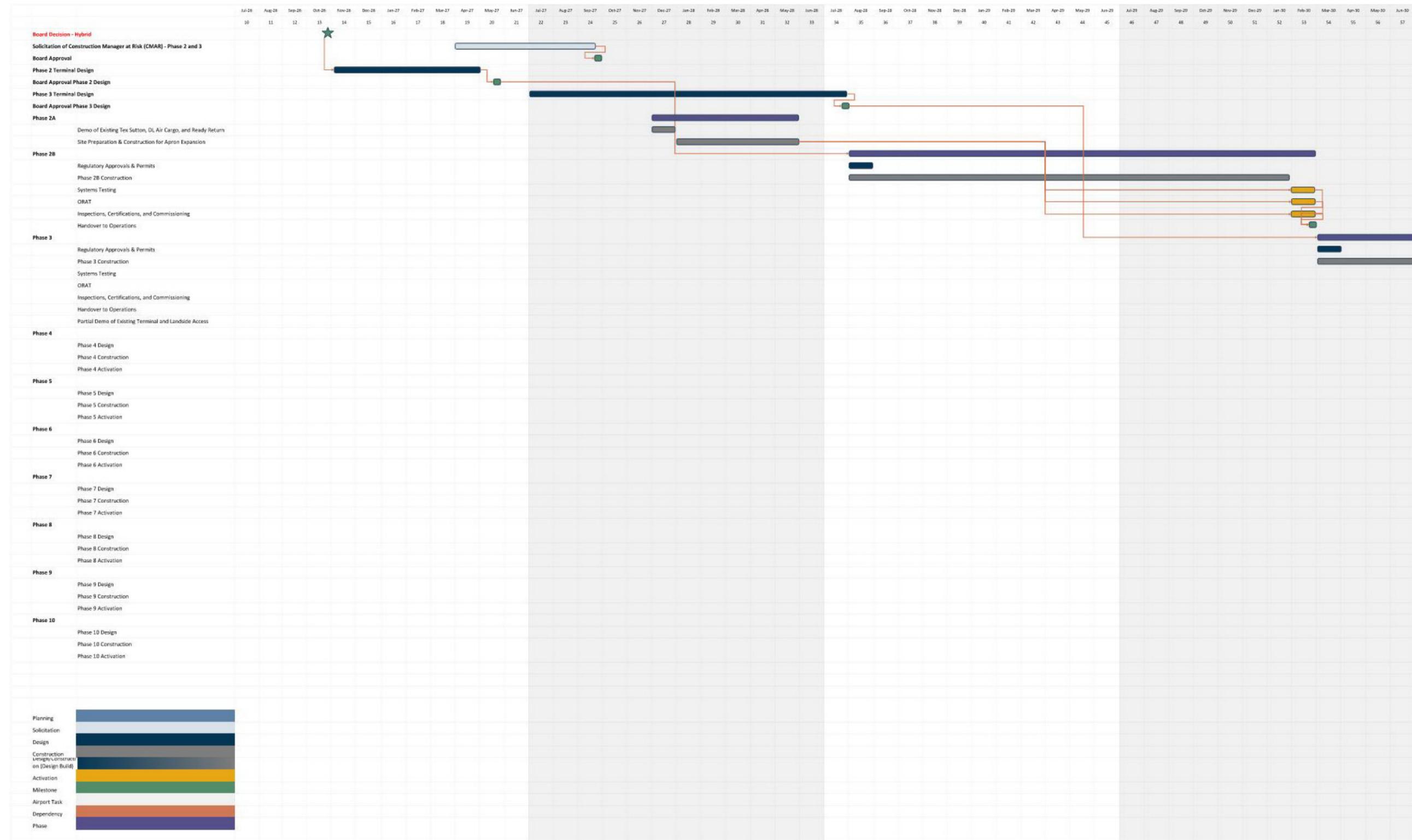
Source: CMT, Alliance, WSP

Exhibit 7.1-4 – Program Implementation Roadmap – Concept 4 (Page 3)



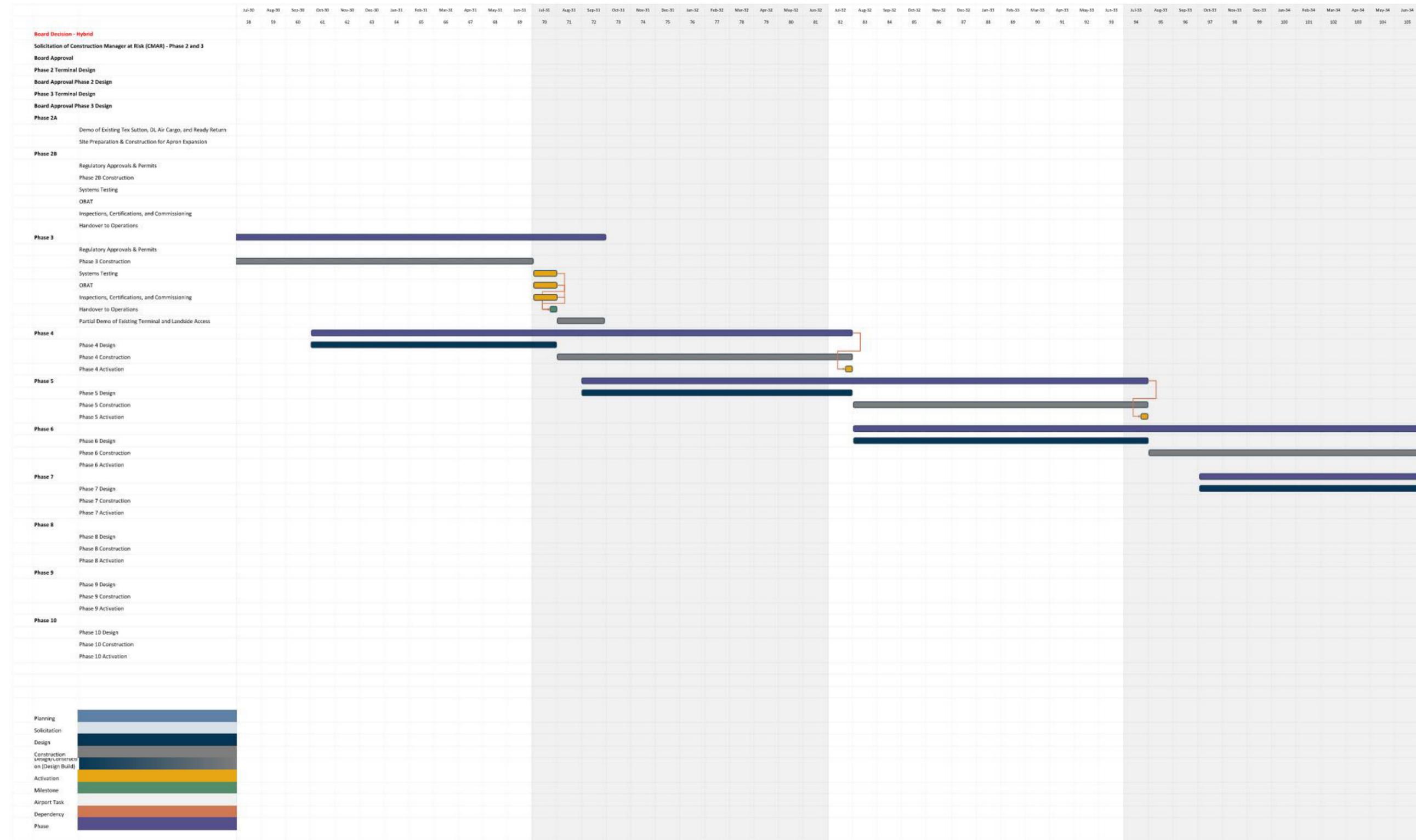
Source: CMT, Alliance, WSP

Exhibit 7.1-5 – Program Implementation Roadmap – Hybrid Concept (Page 1)



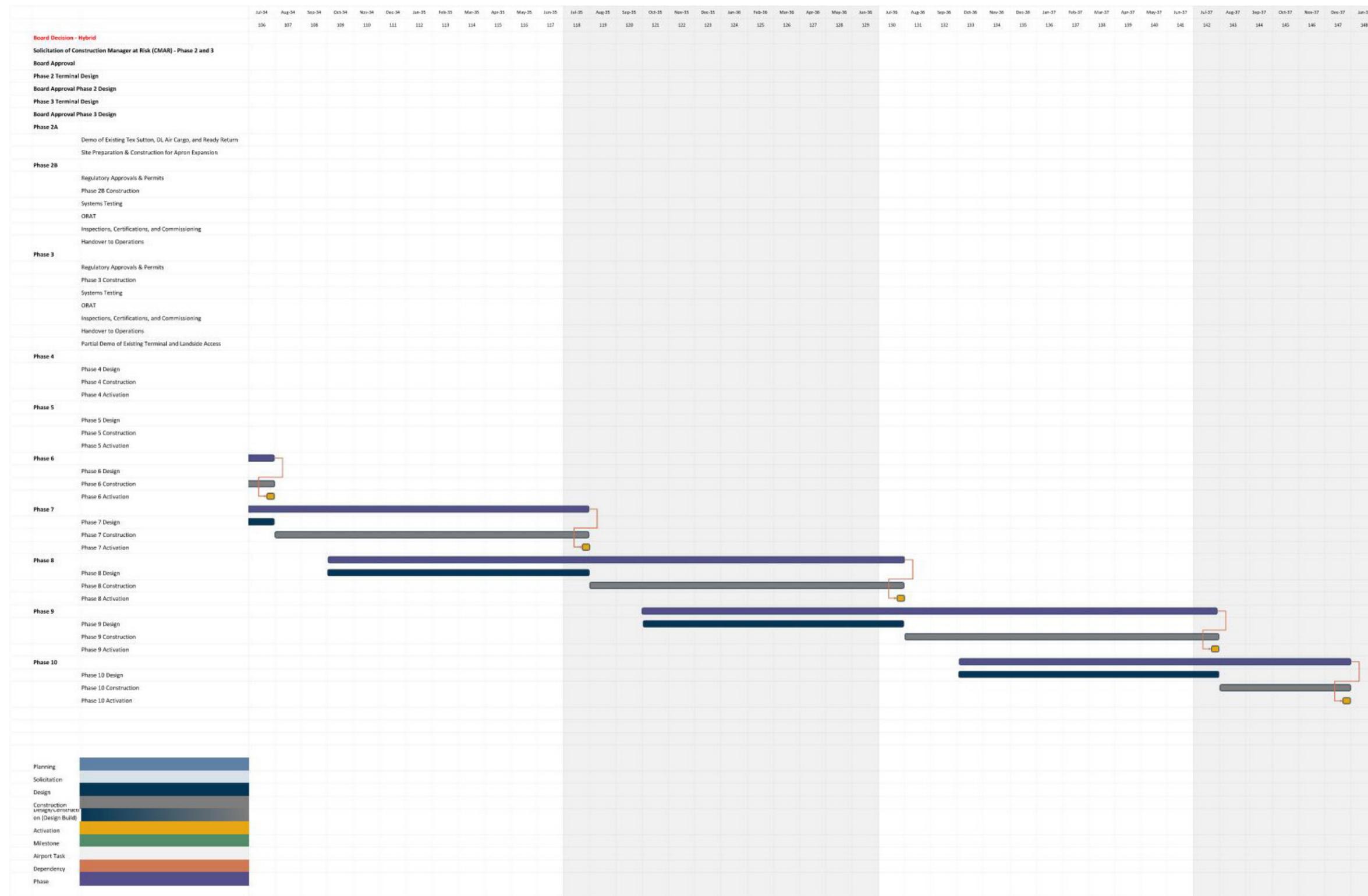
Source: CMT, Alliance, WSP

Exhibit 7.1-6 – Program Implementation Roadmap – Hybrid Concept (Page 2)



Source: CMT, Alliance, WSP

Exhibit 7.1-7 – Program Implementation Roadmap – Hybrid Concept (Page 3)



Source: CMT, Alliance, WSP

Appendix A

Checked Baggage Inspection System Baggage Demand Analysis Report



**BLUE GRASS AIRPORT
LEXINGTON KENTUCKY**
**CHECKED BAGGAGE INSPECTION SYSTEM
BAGGAGE DEMAND ANALYSIS REPORT**
November 1, 2024





Revision History

Revision	Description of Change	Date
Draft	Initial Release	10-29-24
R4 Draft	Claim area adjustments	11-1-24



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Glossary of Terms

Term/Abbreviation	Description
BHS	Baggage Handling System
BPH	Bags per Hour
BPP	Bags per Passenger
CAGR	Compound Annual Growth Rate
CBIS	Checked Baggage Inspection System
DBU	Date of Beneficial Use
DDFS	Design Day Flight Schedule
EDS	Explosive Detection System
FDRS	Field Data Reporting System
OOG	Out of Gauge
OAG	Data acquisition software for flight schedules and other data
OS	Oversized
LEX	Blue Grass Airport
PGDS	Planning Guidelines and Design Standards
ROM	Rough Order of Magnitude
TAF	Terminal Area Forecast
TBD	To Be Determined
TSA	Transportation Security Administration



1 Executive Summary

JSM has been contracted by CMT, Inc. to lead the strategic programming of the baggage handling system as part of the Blue Grass Airport’s terminal expansion.

This study will validate the appropriate equipment needed for an integrated baggage system. Emphasis will be on creating a system that meets the airports growth projections and is compliant with the latest TSA requirements.

To ensure the system keeps pace with the airports growth JSM developed an independent aviation demand forecast involving the following steps:

- Identifying aviation activity parameters and measures to forecast
- Review existing conditions
- Review previous forecasts by others, and
- Create a new forecast using a variety of statistical analyses and IATA Standards

Forecasts were prepared for periods ending 5, 10, and 20 years from the base year of the forecast 2024. Forecasts were also prepared for the peak of each period. The forecasts were then used to determine baggage volumes and system requirements.

Baggage systems are an airport’s largest and most complex operational necessity and space planning for expansion is paramount.

Goals

During the development of this document and in collaboration with the design team the following project tasks were defined.

- Estimate number of EDS machines needed 10 years after DBO
- Estimate the square footage required
- Number and size of equipment needed for Inbound and outbound baggage
- Current baggage System Technologies available

Task 1 Objectives:

- 1) Estimate of the number of CTX machines needed 10 years after DBO.
 - a. Gather data for the assessment including drawings, current and DDFS flight schedules, EDS machine types and other data. Demand analysis to determine average day peak month volumes, TAF growth numbers and screening equipment needs to address future demand.
 - b. Using three data independent data sets the number of current full in-line screening machines will be 1 machine active and 1 machine redundant (N+1 = 2 machines).
 - c. The capacity of the existing EDS machines will be exceeded by 2030. This indicates an urgency to push forward a project to replace the current system
 - d. TSA funding criteria 2 is, peak month average daily bag count of 1,600 bags/day after growth to DBU. This criterion is met for 2024 with a value of 2,003 bags/day.
 - e. We recommend reserving space for 1 additional future machine.





- 2) Estimate of the square footage required
 - a. CBIS/CBRA is 9,200 sq ft (1+1 EDS) – 10,470 sq ft to reserve space for a future EDS line (2+1 EDS)
 - b. TSA support offices and IT are an additional 960 sq ft
 - c. Make-up space including tug traffic is 15,000 sq ft
 - d. Claim area is 19,080 sq ft for 4 devices through PAL 3 and will grow to 23,850 sq ft for 5 devices in PAL 4. There may be opportunity to reduce the number of claims by having the 50 and 70 passenger flights share a common claim, making the number of claims not exceed 4.
- 3) Linear Feet/Number of devices both inbound and outbound
 - a. The outbound makeup capacity requirements were evaluated using the 2024 peak month/design day flight schedule. The results were compared to the single makeup shown in the Master Plan (PAL 4). The difference in results was nearly the same and it can be concluded that a linear 300 ft unit would suffice.
 - b. The inbound inclined plate claim capacity requirements were evaluated using the 2024 peak month/design day flight schedule. There was no claim design layout shown in the Master Plan. Based on the peak active flights for the ADPM data set, the number of claim units were 3 at 2030 and 5 at 2045, while the DDFS number of claim units were 5 at 2030 and 5 at 2045. This is basically the same as the Master Plan PAL1 and PAL4 numbers. The claim presentation length is 155 linear feet each device. As stated above, if flight sharing is acceptable, the maximum number of claims will not exceed 4 through PAL 4.

2 Data Collection

In order to analyze system demand and capacity, critical, site-specific data is required. The following sections present the data used in this capacity analysis.

2.1 Average Number of Bags per Passenger (BPP)

The number of bags per passenger used for this study are the PGDS v8 values shown in the table below. PGDS v8 uses 0.7 bags per passenger (bpp) for domestic and 1.0 bpp for originating International and recheck international to domestic. The PGDS value of 0.7 for domestic was adopted for this report.

Flight Type	PGDS
Domestic	.7
International	1.0

2.2 Oversize (OS) / Out-of-Gauge (OOG)

Oversize bags and out-of-gauge volumes/percentages are identified as part of this analysis. OS/OOG bags are not screened by the EDS machines and the percentage of these bags is deducted from the volume actually processed by the EDS screening system.

Oversize bags = 4%

Out-of-Gauge bags = 2%

2.3 Forecasted Growth

2.3.1 Flight Schedule

The flight schedule drives all of the dynamics of passenger and bag volumes

2.4 ADPM Schedule Peak October 10, 2024

Date	Airline	Depart Flight #	Depart Time	Dest	Dom/Int	Aircraft IATA	Seats
Oct 10, 2024	AA	4253	5:17:00 AM	DFW	Dom	E75	76
Oct 10, 2024	DL	2184	6:00:00 AM	ATL	Dom	717	110
Oct 10, 2024	AA	2231	6:00:00 AM	CLT	Dom	319	128
Oct 10, 2024	DL	3977	6:15:00 AM	DTW	Dom	CR9	70
Oct 10, 2024	DL	5734	6:25:00 AM	DCA	Dom	E70	69
Oct 10, 2024	AA	6151	6:32:00 AM	ORD	Dom	CRJ	50
Oct 10, 2024	AA	2837	6:45:00 AM	CLT	Dom	319	128
Oct 10, 2024	DL	3058	7:05:00 AM	ATL	Dom	739	180
Oct 10, 2024	UA	5633	7:20:00 AM	ORD	Dom	E7W	70
Oct 10, 2024	AA	5821	7:40:00 AM	PHL	Dom	ER4	50
Oct 10, 2024	UA	4741	9:00:00 AM	DEN	Dom	E7W	70
Oct 10, 2024	G4	486	9:14:00 AM	FLL	Dom	320	177
Oct 10, 2024	AA	3412	9:20:00 AM	DFW	Dom	E75	76
Oct 10, 2024	DL	2232	10:28:00 AM	ATL	Dom	717	110
Oct 10, 2024	AA	5572	10:57:00 AM	CLT	Dom	CR9	76
Oct 10, 2024	AA	6068	11:06:00 AM	PHL	Dom	CRJ	50





Date	Airline	Depart Flight #	Depart Time	Dest	Dom/Int	Aircraft IATA	Seats
Oct 10, 2024	DL	4010	11:20:00 AM	DTW	Dom	CR9	76
Oct 10, 2024	UA	4417	12:25:00 PM	ORD	Dom	CR5	50
Oct 10, 2024	DL	3096	1:18:00 PM	ATL	Dom	739	180
Oct 10, 2024	AA	6136	1:27:00 PM	ORD	Dom	CRJ	50
Oct 10, 2024	UA	5445	2:00:00 PM	ORD	Dom	E7W	76
Oct 10, 2024	AA	4260	2:03:00 PM	DFW	Dom	E75	76
Oct 10, 2024	G4	74	2:11:00 PM	LAS	Dom	320	177
Oct 10, 2024	AA	2914	2:21:00 PM	CLT	Dom	320	150
Oct 10, 2024	DL	3078	3:53:00 PM	ATL	Dom	717	110
Oct 10, 2024	G4	2613	4:23:00 PM	PIE	Dom	320	177
Oct 10, 2024	AA	6092	5:21:00 PM	ORD	Dom	CRJ	50
Oct 10, 2024	DL	5641	5:49:00 PM	DTW	Dom	E75	76
Oct 10, 2024	UA	5871	6:11:00 PM	ORD	Dom	E7W	70
Oct 10, 2024	AA	3491	6:11:00 PM	DFW	Dom	E75	76
Oct 10, 2024	AA	2898	6:12:00 PM	CLT	Dom	319	128
Oct 10, 2024	AA	5766	6:15:00 PM	PHL	Dom	ER4	50
Oct 10, 2024	DL	3143	6:17:00 PM	ATL	Dom	717	110
Oct 10, 2024	DL	1602	7:51:00 PM	ATL	Dom	319	132
Oct 10, 2024	AA	5584	8:16:00 PM	CLT	Dom	CR9	76
Oct 10, 2024	G4	1244	9:10:00 PM	SFB	Dom	320	177

2.5 DDFS Schedule Base and Escalations

Date	Airline	Depart Flight #	Depart Time	Dest	Dom/Int	Aircraft IATA	Seats
2024	AA	5303	5:00:00 AM	CLT	Dom	CR9	76
2024	DL	2184	6:00:00 AM	ATL	Dom	717	110
2024	AA	343	6:00:00 AM	DFW	Dom	320	150
2024	DL	3977	6:15:00 AM	DTW	Dom	CR9	76
2024	DL	5734	6:25:00 AM	DCA	Dom	E70	69
2024	AA	3444	6:56:00 AM	ORD	Dom	E70	65
2024	AA	499	6:59:00 AM	CLT	Dom	319	128
2024	DL	3058	7:05:00 AM	ATL	Dom	739	180
2024	UA	4422	7:05:00 AM	ORD	Dom	CR5	50
2024	UA	5389	9:36:00 AM	DEN	Dom	E7W	70
2024	DL	2232	10:27:00 AM	ATL	Dom	717	110
2024	G4	843	10:58:00 AM	PGD	Dom	320	180
2024	AA	6136	10:59:00 AM	ORD	Dom	CRJ	50
2024	AA	5220	11:01:00 AM	PHL	Dom	CR9	76
2024	AA	5572	11:02:00 AM	CLT	Dom	CR9	76
2024	DL	5832	11:41:00 AM	DTW	Dom	E75	76
2024	UA	4406	12:15:00 PM	ORD	Dom	CR5	50
2024	DL	3096	1:04:00 PM	ATL	Dom	717	110
2024	UA	5445	2:00:00 PM	ORD	Dom	CRJ	50
2024	AA	558	2:05:00 PM	DFW	Dom	319	128
2024	G4	2680	2:53:00 PM	PIE	Dom	320	180
2024	DL	3078	3:29:00 PM	ATL	Dom	717	110
2024	G4	1290	3:56:00 PM	SFB	Dom	320	177
2024	AA	1570	4:04:00 PM	CLT	Dom	320	150
2024	UA	4449	5:10:00 PM	ORD	Dom	CR5	50
2024	AA	3786	5:17:00 PM	ORD	Dom	E70	65
2024	AA	2953	5:51:00 PM	CLT	Dom	319	128
2024	DL	5845	5:51:00 PM	DTW	Dom	E75	76
2024	DL	3143	6:26:00 PM	ATL	Dom	717	110
2024	AA	5392	8:22:00 PM	DFW	Dom	CR9	76
2024	AA	1521	8:23:00 PM	CLT	Dom	320	150
2025	AA	5303	5:07:00 AM	CLT	Dom	CR9	76
2025	DL	2184	6:00:00 AM	ATL	Dom	320	157
2025	G4	843	10:58:00 AM	PGD	Dom	320	180
2025	G4	2680	2:53:00 PM	PIE	Dom	320	180
2025	G4	1290	3:56:00 PM	SFB	Dom	320	177
2030	DL	5555	6:00:00 AM	LGA	Dom	CR9	76
2030	AA	3444	6:56:00 AM	ORD	Dom	E75	76
2030	G4	843	10:58:00 AM	PGD	Dom	320	180
2030	MX	2222	11:06:00 AM	MCO	Dom	223	137
2030	AA	6136	12:01:00 PM	ORD	Dom	E75	76
2030	UA	4429	12:05:00 PM	ORD	Dom	E7W	76
2030	UA	4404	2:00:00 PM	ORD	Dom	E7W	76
2030	G4	2680	2:53:00 PM	PIE	Dom	320	180
2030	G4	1290	3:56:00 PM	SFB	Dom	320	177
2030	UA	4444	4:35:00 PM	EWR	Dom	E7W	76
2030	AA	3786	5:17:00 PM	ORD	Dom	E75	76
2035	DL	5555	6:00:00 AM	LGA	Dom	CR9	76



Date	Airline	Depart Flight #	Depart Time	Dest	Dom/Int	Aircraft IATA	Seats
2035	AA	3444	6:56:00 AM	ORD	Dom	E75	76
2035	DL	3058	7:10:00 AM	ATL	Dom	320	157
2035	DL	2232	10:55:00 AM	ATL	Dom	320	157
2035	G4	843	10:58:00 AM	PGD	Dom	320	180
2035	MX	2222	11:06:00 AM	MCO	Dom	223	137
2035	AA	6136	12:01:00 PM	ORD	Dom	E75	76
2035	UA	4429	12:05:00 PM	ORD	Dom	E7W	76
2035	DL	3096	1:30:00 PM	ATL	Dom	320	157
2035	UA	4404	2:00:00 PM	ORD	Dom	E7W	76
2035	G4	2680	2:53:00 PM	PIE	Dom	320	180
2035	DL	3078	3:45:00 PM	ATL	Dom	320	157
2035	G4	1290	3:56:00 PM	SFB	Dom	320	177
2035	UA	9999	4:10:00 PM	IAH	Dom	E7W	76
2035	UA	4444	4:35:00 PM	EWR	Dom	E7W	76
2035	AA	3786	5:17:00 PM	ORD	Dom	E75	76
2035	DL	3143	6:29:00 PM	ATL	Dom	320	157
2035	DL	5462	7:45:00 PM	ATL	Dom	320	157
2040	DL	5555	6:00:00 AM	LGA	Dom	CR9	76
2040	AA	343	6:09:00 AM	DFW	Dom	7M8	172
2040	AA	3444	6:56:00 AM	ORD	Dom	E75	76
2040	DL	3058	7:10:00 AM	ATL	Dom	320	157
2040	AA	3222	7:25:00 AM	PHL	Dom	CR9	76
2040	DL	2232	10:55:00 AM	ATL	Dom	320	157
2040	G4	843	10:58:00 AM	PGD	Dom	320	180
2040	MX	2222	11:06:00 AM	MCO	Dom	223	137
2040	AA	6136	12:01:00 PM	ORD	Dom	E75	76
2040	UA	4429	12:05:00 PM	ORD	Dom	E7W	76
2040	DL	3096	1:30:00 PM	ATL	Dom	320	157
2040	UA	4404	2:00:00 PM	ORD	Dom	E7W	76
2040	AA	558	2:35:00 PM	DFW	Dom	7M8	172
2040	G4	2680	2:53:00 PM	PIE	Dom	320	180
2040	DL	3078	3:45:00 PM	ATL	Dom	320	157
2040	AA	4222	3:55:00 PM	PHL	Dom	CR9	76
2040	G4	1290	3:56:00 PM	SFB	Dom	320	177
2040	UA	9999	4:10:00 PM	IAH	Dom	E7W	76
2040	UA	4444	4:35:00 PM	EWR	Dom	E7W	76
2040	AA	3786	5:17:00 PM	ORD	Dom	E75	76
2040	DL	3143	6:29:00 PM	ATL	Dom	320	157
2040	DL	5462	7:45:00 PM	ATL	Dom	320	157
2040	AA	5392	8:22:00 PM	DFW	Dom	7M8	172
2045	DL	5555	6:00:00 AM	LGA	Dom	CR9	76
2045	AA	343	6:09:00 AM	DFW	Dom	7M8	172
2045	AA	7777	6:15:00 AM	MIA	Dom	E75	76
2045	AA	3444	6:56:00 AM	ORD	Dom	E75	76
2045	DL	3058	7:10:00 AM	ATL	Dom	321	191
2045	AA	3222	7:25:00 AM	PHL	Dom	CR9	76
2045	DL	3977	7:30:00 AM	DTW	Dom	221	109
2045	UA	5633	7:30:00 AM	ORD	Dom	319	126
2045	UA	4741	9:00:00 AM	DEN	Dom	319	126

Date	Airline	Depart Flight #	Depart Time	Dest	Dom/Int	Aircraft IATA	Seats
2045	DL	2232	10:55:00 AM	ATL	Dom	320	157
2045	G4	843	10:58:00 AM	PGD	Dom	320	180
2045	MX	2222	11:06:00 AM	MCO	Dom	223	137
2045	AA	6136	12:01:00 PM	ORD	Dom	E75	76
2045	UA	4429	12:05:00 PM	ORD	Dom	E7W	76
2045	DL	3096	1:30:00 PM	ATL	Dom	320	157
2045	UA	4404	2:00:00 PM	ORD	Dom	E7W	76
2045	G4	888	2:16:00 PM	LAS	Dom	319	156
2045	AA	558	2:35:00 PM	DFW	Dom	7M8	172
2045	G4	2680	2:53:00 PM	PIE	Dom	320	180
2045	DL	3078	3:45:00 PM	ATL	Dom	320	157
2045	AA	4222	3:55:00 PM	PHL	Dom	CR9	76
2045	G4	1290	3:56:00 PM	SFB	Dom	320	177
2045	UA	9999	4:10:00 PM	IAH	Dom	E7W	76
2045	UA	4444	4:35:00 PM	EWR	Dom	E7W	76
2045	AA	3786	5:17:00 PM	ORD	Dom	E75	76
2045	DL	3143	6:29:00 PM	ATL	Dom	320	157
2045	DL	5462	7:45:00 PM	ATL	Dom	320	157
2045	AA	5392	8:22:00 PM	DFW	Dom	7M8	172

2.5.1 Terminal Area Forecast

The Terminal Area Forecast (TAF) provided by the FAA is an industry standard used for growth data in screening system planning. The following table presents the most recent data available at the time of this study. The TAF numbers show a Compound Annual Growth Rate (CAGR) close to 2.04% for DBU+5, which is typical observed for similar airports. The composite growth rates are also shown starting from the 2023 current year.

TAF Growth Rates (As of Jan 2024)						
Fiscal Year	Air Carrier		Enplanements			
	Air Carrier	Commuter	Total	Growth %	CAGR	Growth Factor
2023	333,575	300,672	634,247	10.92%		
2024 Data Year	394,077	338,370	732,447	15.48%	1.0000	1.000
2025 DBU	414,859	355,057	769,916	5.12%	1.0249	1.025
2026	424,331	362,885	787,216	2.25%	1.0249	1.051
2027	432,650	369,999	802,649	1.96%	1.0249	1.077
2028	441,167	377,278	818,445	1.97%	1.0249	1.104
2029	449,408	384,332	833,740	1.87%	1.0249	1.131
2030 DBU+5	457,713	391,438	849,151	1.85%	1.0249	1.159
2031	466,064	398,572	864,636	1.82%	1.0249	1.188
2032	474,462	405,738	880,200	1.80%	1.0249	1.218
2033	482,743	412,817	895,560	1.75%	1.0249	1.248
2034	491,081	419,940	911,021	1.73%	1.0249	1.279
2035 DBU+10	499,885	427,488	927,373	1.79%	1.0249	1.311
2036	509,120	435,388	944,508	1.85%	1.0249	1.344
2037	518,276	443,191	961,467	1.80%	1.0249	1.378
2038	527,630	451,206	978,836	1.81%	1.0249	1.412
2039	537,344	459,512	996,856	1.84%	1.0249	1.447
2040 DBU+15	547,256	467,987	1,015,243	1.84%	1.0249	1.483



TAF Growth Rates (As of Jan 2024)						
Fiscal Year			Enplanements			
	Air Carrier	Commuter	Total	Growth %	CAGR	Growth Factor
2041	557,093	476,386	1,033,479	1.80%	1.0249	1.520
2042	567,379	485,183	1,052,562	1.85%	1.0249	1.558
2043	577,906	494,167	1,072,073	1.85%	1.0249	1.597
2044	588,518	503,215	1,091,733	1.83%	1.0249	1.637
2045 DBU+20	599,368	512,507	1,111,875	1.84%	1.0249	1.678
2046	610,092	521,687	1,131,779	1.79%	1.0249	1.720

2.6 Passenger Arrival Distributions

The passenger profile distribution specifies the percentage of passengers that arrive at the airport within a specific time period before the flight departs. The earliness distributions are used to determine the flow of departing passengers. Arrival data is from TSA's latest design guidelines PGDS v8 modified with a cutoff of 2:45 hours.



2.7 Load Factors

The load factors used for this report are defined by were provided in the DDFS data set. They are broken out by destination and airline:

Source/ Destination Airports				
Airport	Airport Code	Domestic or International	Airline	Load Factor
Atlantic City International Airport, NJ, USA	ACY	Dom	SY	0.85
Hartsfield-Jackson Atlanta Int Airport, GA, S	ATL	Dom	DL	0.92
Charlotte Douglas Airport, NC, US	CLT	Dom	AA	0.70
Columbia Regional Airport, MO, US	COU	Dom	SY	0.85
Washington National Airport, VA, US	DCA	Dom	DL	0.57
Denver International Airport, CO, US	DEN	Dom	UA	0.91
Dallas Fort Worth Int Airport, TX, US	DFW	Dom	AA	0.85
Detroit Metro Airport, MI, US	DTW	Dom	DL	0.84
Newark Liberty International Airport, NJ, USA	EWR	Dom	UA	0.84
Fort Lauderdale-Hollywood Int Airport, FL, US	FLL	Dom	G4	0.85
Gulfport-Biloxi International Airport, MS, US	GPT	Dom	SY	0.85
Houston Intercontinental Airport, TX, US	IAH	Dom	UA	0.84
Las Vegas International Airport, NV, US	LAS	Dom	G4	0.93
Orlando International Airport, FL, US	MCO	Dom	MX	0.84
Miami International Airport, FL, US	MIA	Dom	AA	0.84
Minneapolis-St.Paul International Airport, MN, US	MSP	Dom	SY	0.85
Myrtle Beach International Airport, SC, US	MYR	Dom	G4	0.85
Chicago-O'Hare, IL, US	ORD	Dom	AA	0.86
Chicago-O'Hare, IL, US	ORD	Dom	UA	0.84
Punta Gorda Airport, FL, Us	PGD	Dom	G4	0.94
Philadelphia Int Airport, PA, US	PHL	Dom	AA	0.90
Hattiesburg-Laurel Regional Airport, MS, US	PIB	Dom	SY	0.85
St. Pete-Clearwater International Airport, FL, US	PIE	Dom	G4	0.94
Orlando Sanford International Airport, FL, US	SFB	Dom	G4	0.91
Destin-Fort Walton Beach Airport, FL, US	VPS	Dom	G4	0.85
LaGuardia Airport, NY, US	LGA	Dom	DL	0.84



3 Screening Capacity Analysis

This section of the report presents the peak volumes and capacity analysis based on the information provided by the Airport. The screening capacity was analyzed using 3 data sets as follows

- a. Master plan DDFS data. Forecasted flight schedules for years 2024, 2025, 2030, 2035, 2040, 2045.
- b. Current ADPM 13-month flight schedules, peak month was October 2024.
- c. TSA provided hourly throughputs from 9-1-2023 to 9-19-2024.

3.1 Considerations

- a. Growth was derived from the 2024 TAF data current year 2024 out to 2028 (5-year growth).
- b. Forecasted master plan DDFS data was considered for the years 2024, 2025, 2030, 2035, 2040 and 2045. These planning dates were adopted with 2025 assigned to be DBU for this version of the analysis. When further information known project phase dates will be updated.
- c. The 10-minute demand/throughput was used as the design basis, as prescribed in PGDS v8 for determining capacity requirements.
- d. Site gathered TSA hourly bag throughputs were provided for this analysis. Although the typical TSA quick look report with 10 min throughput statistics would have been preferred, this data was used.
- e. Surge factor is included in the calculation which accounts for variation in passenger (and bag) inter-arrival times and is prescribed by PGDS v8.
- f. Screening machine throughputs used for this analysis were 180 bags/hour (existing, CT80 DR assumed) and 654 bags/hour (future, L-3 eXaminer 3DX 6700 ES). Note that feed conveyor belt speeds need to be reviewed to confirm they can supply the faster throughput EDS machines at an adequate rate.

3.2 Existing System

The existing screening system consists of two lines each having a CT80 machine type normally used for standalone systems or mini in-line systems. Belt conveyors are provided to and from the screening machines. The table below shows a long-term capacity outlook based on the current peak month/design day and TAF growth rates.

The current screening system will not provide enough capacity beyond 2030. This indicates that LEX should begin the process of replacing the current screening system soon given the time required for Design, approval, installation and testing.

Fiscal Year	CAGR	BPH Screened	Calc. EDS Req.	EDS Req. Roundup	EDS (N+0)
2024 Base Year		315.0	1.75	2	n/a
2025	2.49%	321.9	1.79	2	n/a
2030	2.49%	358.9	1.99	2	n/a
2035	2.49%	400.4	2.22	3	n/a
2040	2.49%	447.1	2.48	3	n/a
2045	2.49%	499.5	2.77	3	n/a



3.3 Future Demand and Screening Capacity Requirements

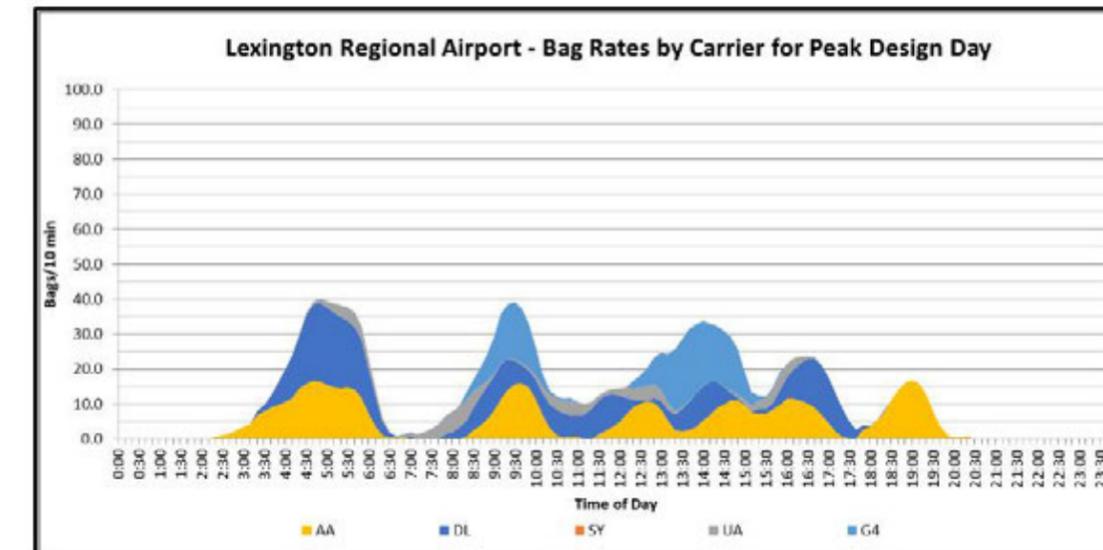
The current and future capacity of the screening system is evaluated based three data sources. Screening capacity requirements assume a new in-line system

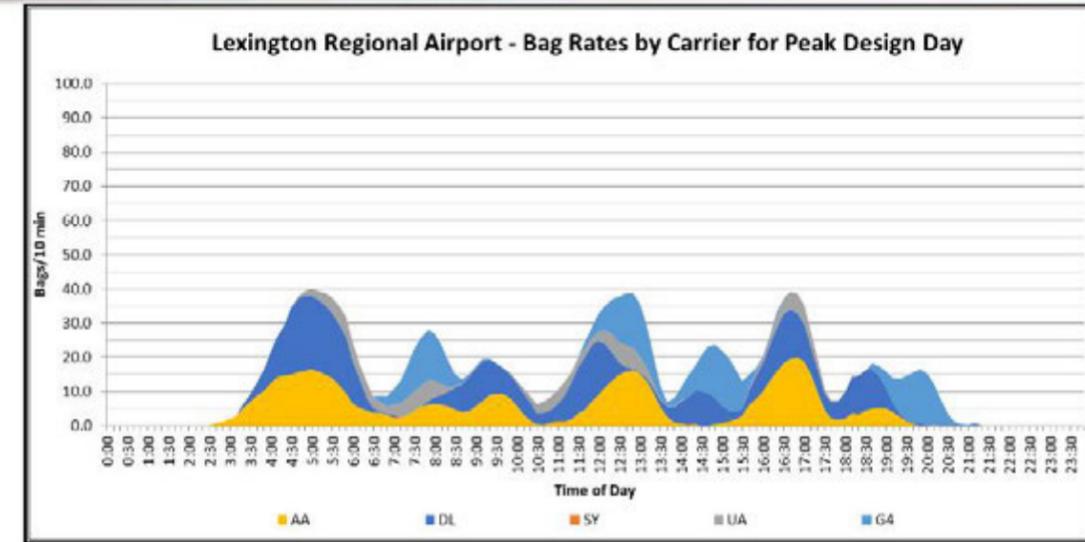
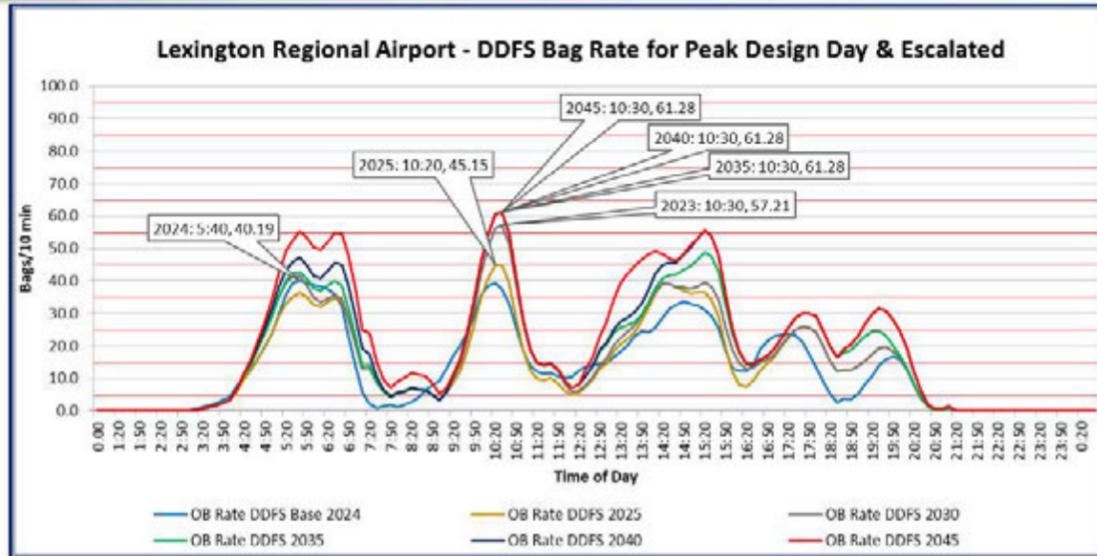
3.3.1 Screening Capacity Based on DDFS

The DDFS forecasted flight schedules were analyzed to determine peak screening rates. The resulting bags rates are shown on the charts below. A notable characteristic of these flight schedules is that planning year 2035, 2040 and 2045 all have the same peak rate. This was due to the projected DDFS flights being added at times that did not impact the peak.

The future screening machine capacity as determined using the DDFS data ranged from .46 to .67 throughout the whole planning horizon, or 1 EDS machine. The total number of machines would be 2 (1 active machine, 1 redundant machine).

Fiscal Year	CAGR	BPH Screened	Calc. EDS Req.	EDS Req. Roundup	EDS (N+1)
2024 Base Year	N/A	300.5	0.46	1	2
2025	N/A	332.8	0.51	1	2
2030	N/A	410.7	0.63	1	2
2035	N/A	436.7	0.67	1	2
2040	N/A	436.7	0.67	1	2
2045	N/A	436.7	0.67	1	2



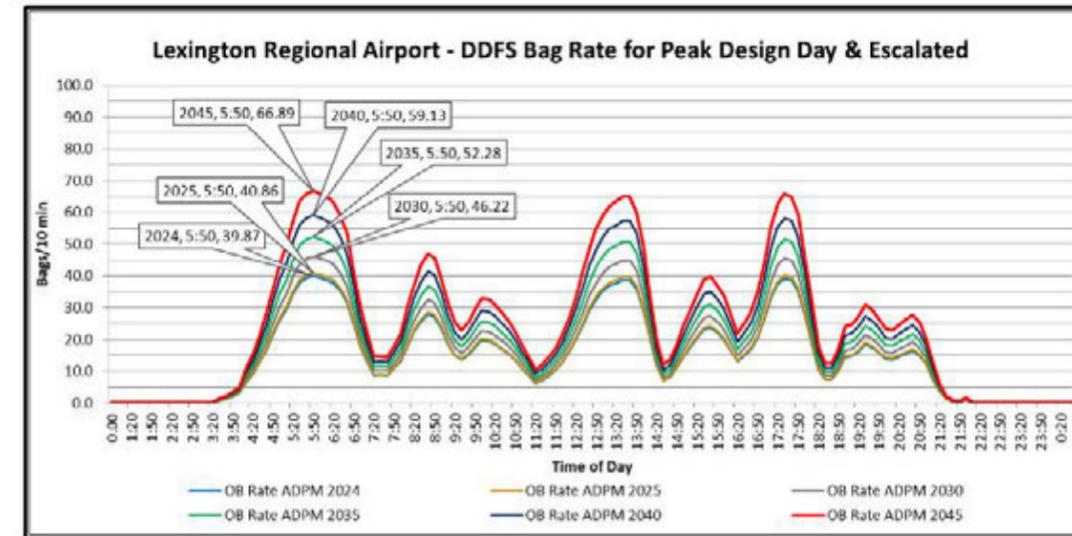


3.3.2 Screening Capacity Based on ADPM

The most recent 10 months of flight schedules were downloaded using the OAG data acquisition service. Schedules From October 2023 to October 2024. October 2024 was the highest passenger volume month in this data set. A design day Thursday October 10, 2024, was adopted. Thursday and Sunday were close in volumes and repeated during the peak month of October 2024. The rates were escalated using the most current TAF data, applied according to PGDS.

The future screening machine capacity as determined using the DDFS data ranged from .46 to .72 throughout the whole planning horizon, or 1 EDS machine. The total number of machines would be 2 (1 active machine, 1 redundant machine).

Extended Equipment Capacity Forecast - ADPM Flight Schedule Data					
Fiscal Year	CAGR	BPH Screened	Calc. EDS Req.	EDS Req. Roundup	EDS (N+1)
2024 Base Year	2.49%	298.3	0.46	1	2
2025	2.49%	304.8	0.47	1	2
2030	2.49%	339.8	0.52	1	2
2035	2.49%	379.0	0.58	1	2
2040	2.49%	423.0	0.65	1	2
2045	2.49%	472.4	0.72	1	2





3.3.3 Bag Rate Based on TSA Field Data Reporting System

The following hourly bag rates from 9-1-2023 to 9-19-2024 were given based on the TSAs site reporting system (FDRS). The EDS machine calculations in this section are based on the 95th percentile rate between the times 4:00 am and 2:00 pm.

The future screening machine capacity as determined using the DDFS data ranged from .27 to .45 throughout the whole planning horizon, or 1 EDS machine. The total number of machines would be 2 (1 active machine, 1 redundant machine). Note: This is derivative, and not the typical TSA report on which capacity planning would be done.

TSA Hourly Data from 4:00am to 2:00pm	
95th Percentile observed bags/hr	175
Average bags/hr	81
Maximum bags/hr	479

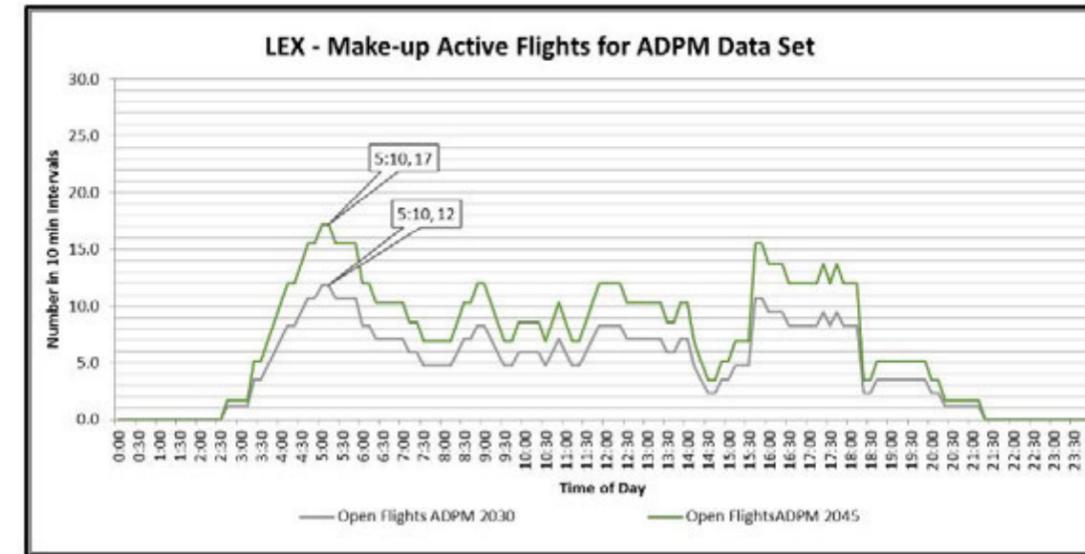
Extended Equipment Capacity Forecast - TSA Hourly Data					
Fiscal Year	CAGR	BPH Screened	Calc. EDS Req.	EDS Req. Roundup	EDS (N+1)
2024 Base Year		175.0	0.27	1	2
2025	2.49%	179.4	0.27	1	2
2030	2.49%	202.9	0.31	1	2
2035	2.49%	229.5	0.35	1	2
2040	2.49%	259.6	0.40	1	2
2045	2.49%	293.6	0.45	1	2

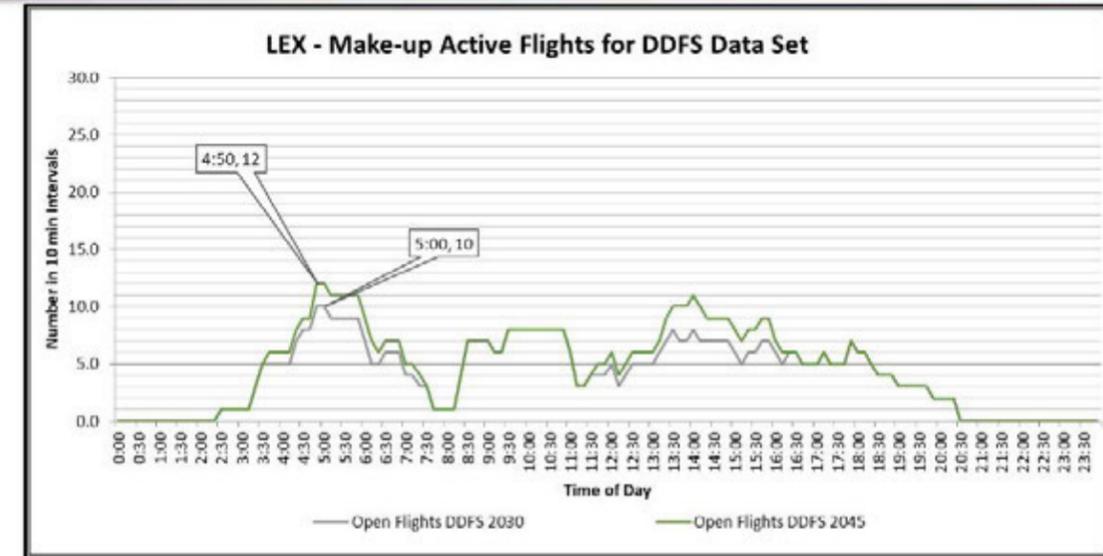
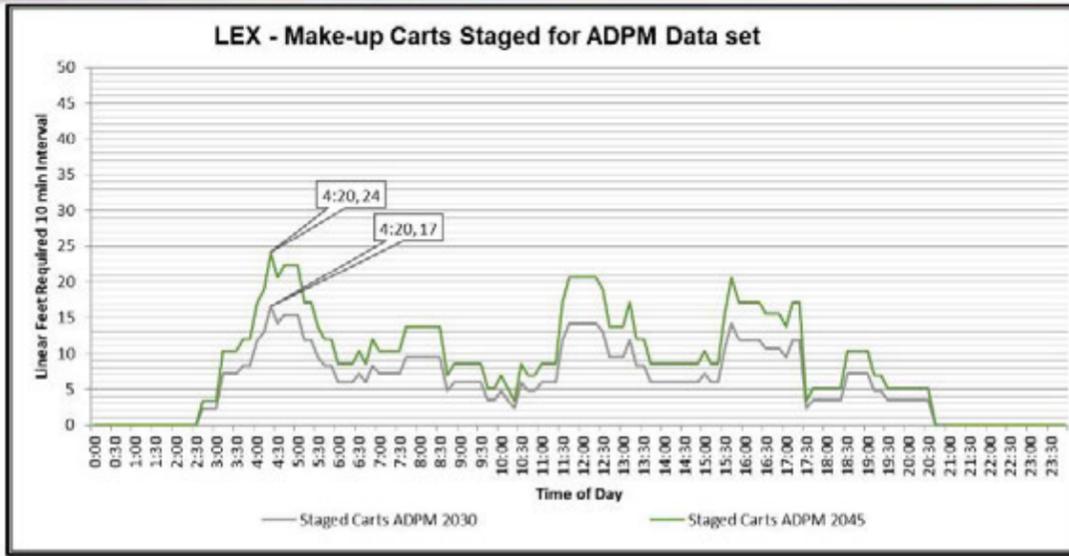


4 OB Makeup Capacity Analysis

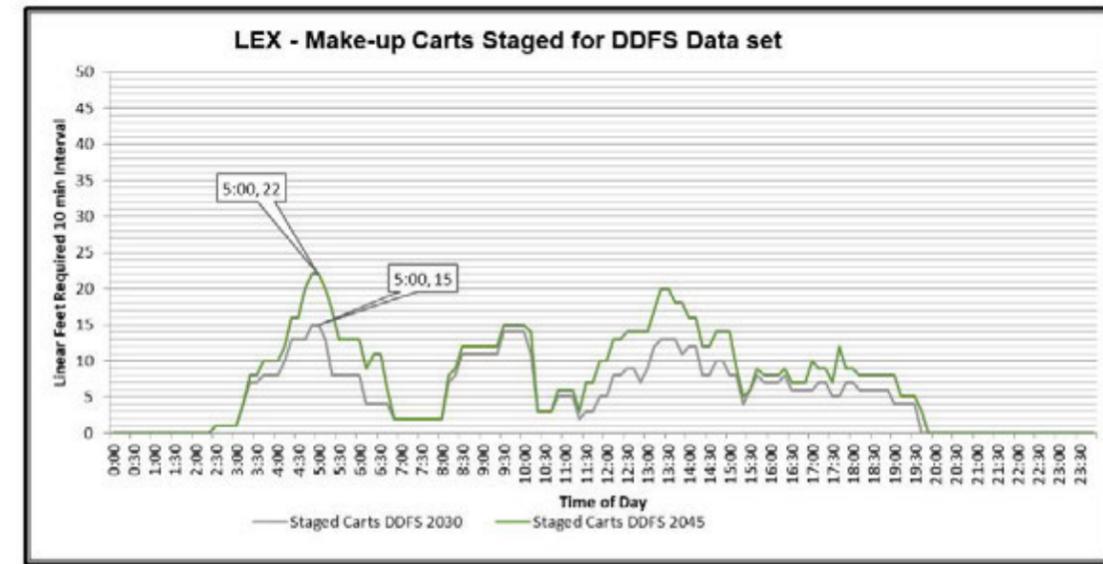
The outbound makeup capacity requirements were evaluated using the 2024 peak month/design day flight schedule and the DDFS flight schedule. The results were compared to the single makeup shown in the Master Plan. The difference was small, and it can be concluded that a linear 300 ft unit would suffice. Both data sets produced the same result.

Current Make-up Capacities					Make-up Demand - ADPM Data Set	
Unit ID	Cart Staging Perimeter ft	Total Perimeter ft	Bag Capacity	Cart Staging Capacity	2030 Max Carts Staged	2045 Max Carts Staged
MU-1	300	300	100.0	23	17	24
Total	300	300	100.0	23	17	24





Current Make-up Capacities					Make-up Demand DDFS Data Set	
Unit ID	Cart Staging Perimeter ft	Total Perimeter ft	Bag Capacity	Cart Staging Capacity	2030 Max Carts Staged	2045 Max Carts Staged
MU-1	300	300	100.0	23	17	24
Total	300	300	100.0	23	17	24

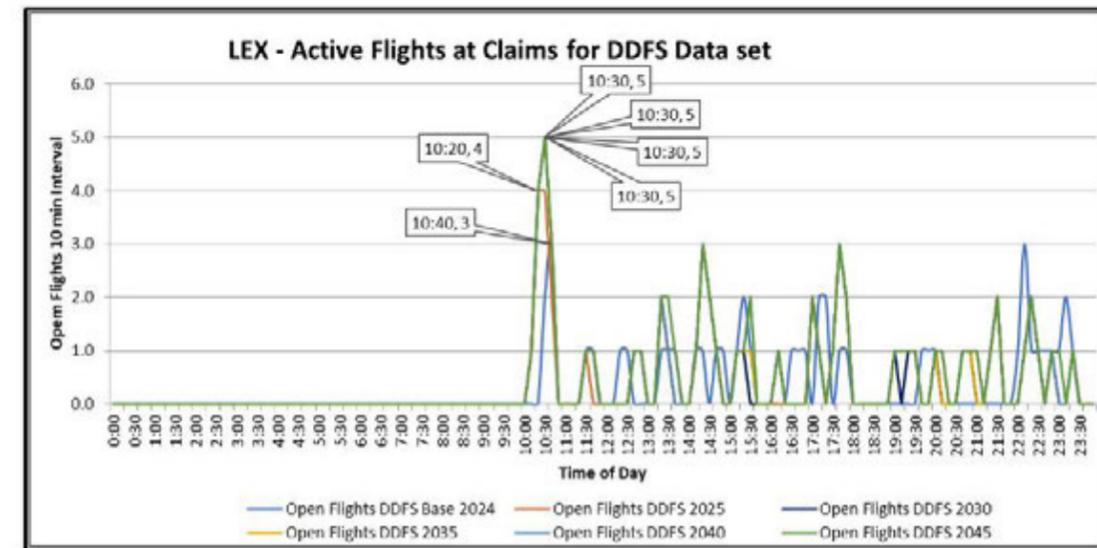
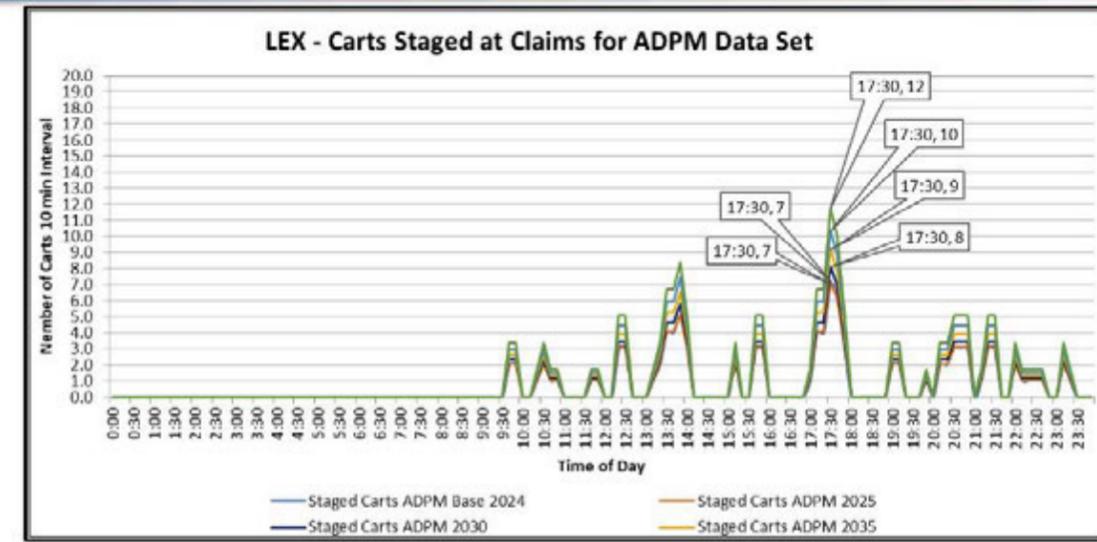
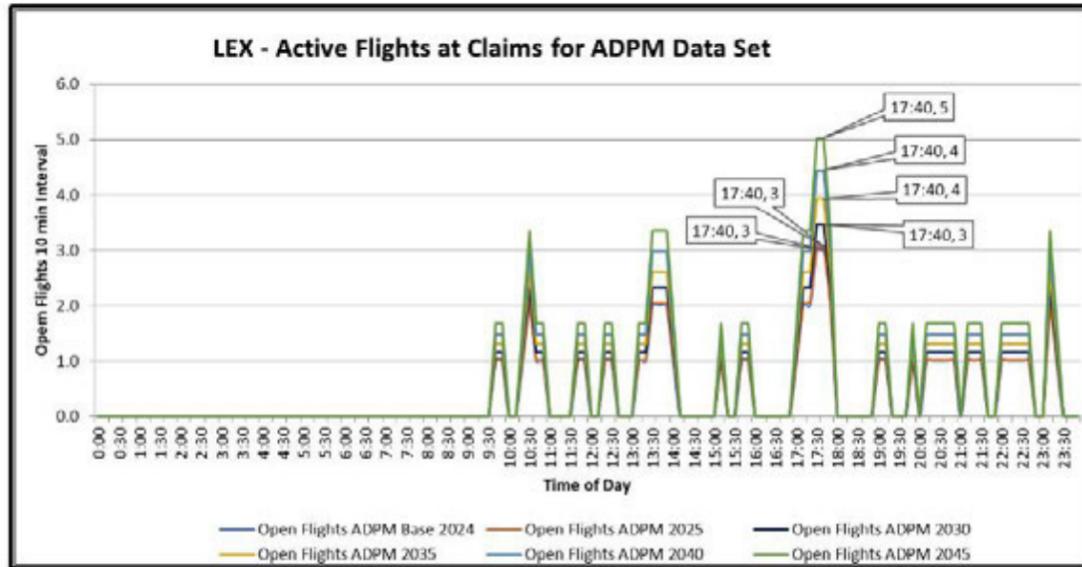


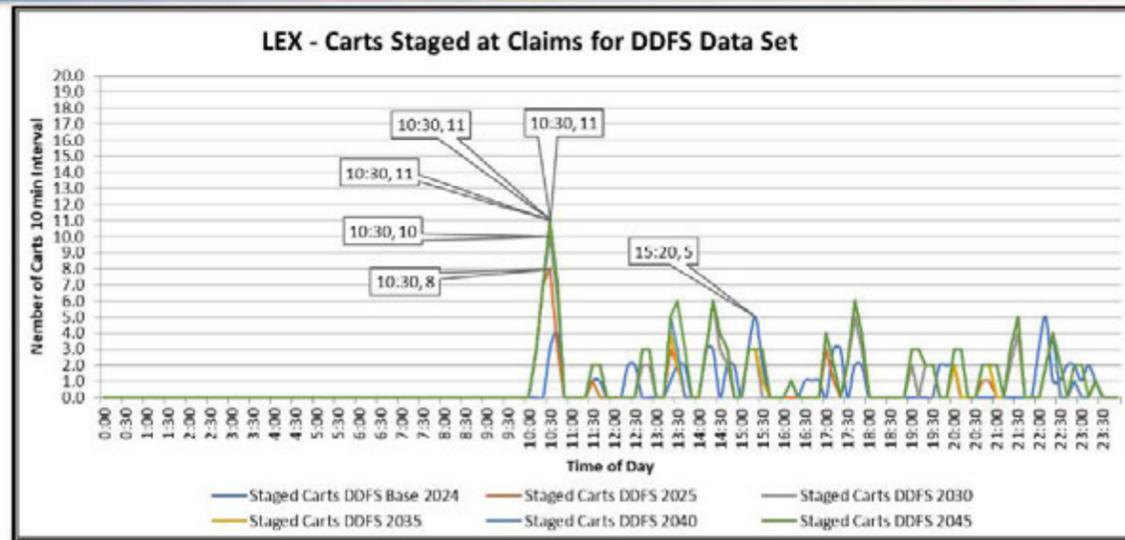


5 Inbound Claim Capacity Analysis

The inbound claim capacity requirements were evaluated using the 2024 peak month/design day flight schedule. There was no claim design layout shown in the Master Plan, although the number of units were shown in the Master Plan as 4 units. Based on the peak active flights for the ADPM flight schedule, the number of claim units were 3 at 2030 and 5 at 2045, while the DDFS number of claim units were 5 at 2030 and 5 at 2045. This is basically the same as the Master Plan PAL1 and PAL4 numbers. Both data set had 2 flights at the peak that were smaller regional jets that could be combined on a designated claim during peaks times, this reducing the number of claims required. As this project progresses, the claim requirements should be further analyzed by considering claim unit types, space constraints and general level of service goals

Claim Requirements Analysis	Inbound ADPM Data Set	Inbound DDFS Data Set
2024 Base Year	3	3
2025	3	4
2030	3	5
2035	4	5
2040	4	5
2045	5	5





6 Baggage System Technologies



6.1 Individual Carrier System (ICS) technology has RFID tracking of the tray/bag and its lower life-cycle costs. Transport of a bag within the carrier reduces the possibility that wheels, straps and odd shaped bags will cause bag jams during processing. The ICS also inherently supports 100% baggage tracking.

6.2 Conventional Conveyor System This reliable technology has been used in airports around the world for decades and is a proven, method of baggage transport. Conventional conveyors typically use gearmotors and variable frequency drives to power the belt conveyors, along with field devices such as photo eyes and shaft encoders to track baggage as it moves through the system. These systems have evolved over time, with most advances occurring in the controls environment, leading to higher energy conservation and improved tracking.

Appendix B

Terminal Space Program

LEX-Lexington Blue Grass Airport		Existing Terminal Space (sf) Full Capacity	2025 Recommended Facilities	2030 Recommended Facilities	2035 Recommended Facilities	2040 Recommended Facilities	2045 Recommended Facilities
GENERAL STATISTICS							
General ¹							
Overall Airport Statistics							
Annual Passengers		1,663,042	1,663,042	2,131,592	2,395,374	2,673,322	2,980,516
Annual Enplanements		831,521	831,521	1,065,796	1,197,687	1,336,661	1,490,258
Peak Hour Passenger Statistics							
Peak Hour Enplaned		456	456	572	615	615	619
Peak Hour Deplaned		463	463	599	639	639	639
Total Peak Hour ²		851	851	1,011	1,095	1,095	1,095
Gates/Positions							
Aircraft Gates/Positions							
II Medium Regional (CR2,CR7,CR9)		1	-	-	-	-	-
III Large Regional (E75,E90)		-	-	-	-	-	-
III Small Narrowbody (B717,A220)		2	-	-	-	-	-
III Narrowbody (A320,A321/B737w)		7	10	11	11	12	13
Total Gates:		10	10	11	11	12	13
Total EQA²:		9.1	12.0	13.2	13.2	14.4	15.6
Total NBEG³:		9.7	10.0	11.0	11.0	12.0	13.0
Total Aircraft Positions:		10	10	11	11	12	13

¹ Annual Passenger numbers are taken from the CMT Aviation Activity Forecast, September 2024

² EQA (Equivalent Aircraft) normalizes gate based on seating capacity of accommodated aircraft.

³ NBEG (Narrow Body Equivalent Gate): Used to normalize the apron frontage demand and capacity to that of a typical narrowbody aircraft gate.

Sources: CMT Aviation Activity Forecast, September 2024 and Alliance Analysis

LEX-Lexington Blue Grass Airport		Existing Terminal Space (sf) Full Capacity	2025 Recommended Facilities	2030 Recommended Facilities	2035 Recommended Facilities	2040 Recommended Facilities	2045 Recommended Facilities
PUBLIC SPACE							
Circulation		Units					
Ticket Lobby Circulation	sf	1,222	2,040	2,280	2,280	2,400	2,400
Baggage Claim Circulation	sf	3,678	2,240	4,280	4,280	4,280	4,280
Airside Concourse Circulation	sf	13,616	15,200	16,720	16,720	18,240	19,760
General Public Circulation (Includes Vestibules, Vert Circ, Corridors)	sf	1,534	19,150	23,930	24,370	25,760	27,190
	Subtotal:	20,050	38,630	47,210	47,650	50,680	53,630
Security Screening Checkpoint (SSCP)		Units					
Number of Lanes	pos	3	3	4	4	4	4
Queuing Area	sf	823	1,800	2,490	2,780	2,780	2,780
Security Screening Area	sf	3,703	4,920	6,520	6,520	6,520	6,520
Exit Corridor	sf	3,967	1,450	1,450	1,450	1,450	1,450
TSA Offices	sf	3,145	3,020	3,870	3,980	3,980	3,980
	Subtotal:	11,638	11,190	14,330	14,730	14,730	14,730
Queuing/Waiting Areas		Units					
Public Seating	sf	-	580	730	800	800	800
Ticket Lobby/Queue (including any free standing kiosks)	sf	3,075	2,470	2,770	2,770	2,880	2,880
Baggage Claim Area ¹							
Claim Devices (Slope plate)	no	2	2	4	4	4	4
Linear Frontage Required	lf	-	329	378	423	423	423
Linear Frontage Programmed	lf	230	310	620	620	620	620
Baggage Claim Hall (Includes Device, Queues & Circulation w/in Positive Claim area)	sf	7,230	9,540	19,080	19,080	19,080	19,080
Domestic Meeter/Greeter Lobby	sf	2,086	1,550	1,990	2,110	2,280	2,110
	Subtotal:	12,391	14,140	24,570	24,760	25,040	24,870
Gate Lounges/Holdrooms							
Gates ¹							
Large Regional (E75,E90)	sf	-	-	-	-	-	-
Small Narrowbody (B717,A220)	sf	-	-	-	-	-	-
Narrowbody (A320,A321/B737w)	sf	-	32,930	36,220	36,220	39,510	42,810
	Subtotal:	23,500	32,930	36,220	36,220	39,510	42,810
Restrooms							
Restrooms - Airside (post-Security)	sf	2,974	3,860	4,460	4,460	4,700	5,060
Restrooms - Landside (pre-Security)	sf	2,624	2,920	3,390	3,630	3,630	3,630
SARA	sf	204	290	290	290	290	290
Nursing Mothers Room	sf	-	530	530	530	530	530
	Subtotal:	5,802	7,600	8,670	8,910	9,150	9,510
Other Space							
Misc Tenant							
Executive Club/USO/Conference	sf	3,880	2,490	2,490	2,490	2,490	2,490
Amenity Lease Space	sf	-	830	1,070	1,200	1,340	1,490
Other (Displays, Information Counters, etc)	sf	150	150	150	150	150	150
	Subtotal:	4,030	3,470	3,710	3,840	3,980	4,130

LEX-Lexington Blue Grass Airport			Existing Terminal Space (sf) Full Capacity	2025 Recommended Facilities	2030 Recommended Facilities	2035 Recommended Facilities	2040 Recommended Facilities	2045 Recommended Facilities
AIRLINE SPACE								
Domestic Airline Space (Includes International Ticketing Space)								
	Units							
Ticket Counter ¹								
Linear Counter Check-in Positions (Kiosk)	pos	0	15(0)	17(0)	17(0)	18(0)	18(0)	
Total Check-in Positions (Kiosk)	pos	0	19(4)	22(5)	22(5)	22(4)	22(4)	
Total Linear Position Length	lf	195	102	114	114	120	120	
Counter Area	sf		1,925	1,020	1,140	1,140	1,200	1,200
Airline Ticket Offices (ATO)	sf		8,863	3,260	3,650	3,650	3,840	3,840
Baggage Service Offices (BSO)	sf		580	1,000	1,250	1,250	1,250	1,500
Subtotal:			11,368	5,280	6,040	6,040	6,290	6,540
Other Airline Space								
Outbound Bag Make-up ¹	sf		18,584	8,750	10,000	10,630	11,250	13,130
Checked Baggage Screening (TSA Space) ²	sf		8,313	7,620	7,620	7,620	7,620	11,430
Level 1 Inspection Units	no	2	2	2	2	2	3	
Airside Operations/Storage (IT, Offices, etc.)	sf		2,025	3,480	3,830	3,830	4,180	4,520
Inbound Baggage Claim Laydown	sf		4,281	2,400	4,800	4,800	4,800	4,800
Inbound/Outbound Baggage Circulation & Storage	sf	Incl in existing In/Out		1,630	2,170	2,260	2,350	2,620
Other Airline Offices/Systems & Support	sf		-	350	380	380	420	450
Subtotal:			33,203	24,230	28,800	29,520	30,620	36,950
CONCESSIONS SPACE								
Landside Concessions (pre-Security)								
	Units							
Rental Car/Ground Transportation								
Number of Counters	pos	4	4	5	5	5	6	
Counter Area/Offices	sf		1,594	1,600	2,000	2,000	2,000	2,400
Queue	sf		988	800	1,000	1,000	1,000	1,200
Landside Concessions	sf		7,960	830	1,070	1,200	1,340	1,490
Support/Storage (Prep Areas, Offices, etc)	sf		-	170	210	240	270	300
Subtotal:			10,542	3,400	4,280	4,440	4,610	5,390
Airside Concessions (post Security)								
Airside Concessions	sf		16,052	7,480	9,590	10,780	12,030	13,410
Support/Storage (Prep Areas, Offices, etc)	sf		273	1,500	1,920	2,160	2,410	2,680
Subtotal:			16,325	8,980	11,510	12,940	14,440	16,090
US CUSTOMS AND BORDER PROTECTION SERVICES (CBP/FIS)								
Subtotal:			-	32,000	32,000	32,000	32,000	32,000
NON-PUBLIC SPACE								
Non-Airline Tenant Space								
	Units							
Airport Administration								
Offices/Support/Storage	sf		16,936	16,940	16,940	16,940	16,940	16,940
Airport Police (Includes Locker Facilities)	sf		-	-	-	-	-	-
Misc Tenant-Vacant	sf		-	-	-	-	-	-
Subtotal:			16,936	16,940	16,940	16,940	16,940	16,940
Restrooms/Circulation								
Non-Public Restrooms	sf		540	930	930	930	930	930
Non-Public Circulation (Includes Vertical Circ)	sf		-	5,190	5,870	5,980	6,140	6,840
Other	sf		-	-	-	-	-	-
Subtotal:			540	6,120	6,800	6,910	7,070	7,770
Building Systems								
Loading Docks								
# of Bays	#	0	1	1	1	1	1	
Airport Operations (Maintenance, Janitorial, Storage, Shops)	sf		8,417	4,100	4,820	4,900	5,100	5,430
Mechanical/Electrical/Plumbing(MEP)/Communications/IT	sf		14,566	16,390	19,290	19,590	20,400	21,710
Building Structure/Non-net/Void	sf		24,235	11,270	13,260	13,470	14,030	14,920
Subtotal:			47,218	31,760	37,370	37,960	39,530	42,060

LEX-Lexington Blue Grass Airport		Existing Terminal Space (sf) Full Capacity	2025 Recommended Facilities	2030 Recommended Facilities	2035 Recommended Facilities	2040 Recommended Facilities	2045 Recommended Facilities	
SUMMARY								
General								
2025-2045	Annual Enplanements	831,521	831,521	1,065,796	1,197,687	1,336,661	1,490,258	
	Annual O&D Enplanements (%)	831,521 (100.%)	831,521 (100.%)	1,065,796 (100.%)	1,197,687 (100.%)	1,336,661 (100.%)	1,490,258 (100.%)	
	Peak Hour Enplaned Domestic	456	456	572	615	615	619	
	Peak Hour Deplaned Domestic	463	463	599	639	639	639	
	Gates/Contact Aircraft Positions	10	10	11	11	12	13	
Public Space								
	Circulation (Ticketing, Baggage Claim, Seating, General Circ, Airside Post Security)	sf	20,050	38,630	47,210	47,650	50,680	53,630
	TSA Security Screening Area (queue, screening, offices)	sf	11,638	11,190	14,330	14,730	14,730	14,730
	Queuing/Waiting Areas (Public Seating, Ticket Lobby, Baggage Claim Hall, Meeter/Greeter)	sf	12,391	14,140	24,570	24,760	25,040	24,870
	Gate Holdrooms	sf	23,500	32,930	36,220	36,220	39,510	42,810
	Restrooms (Pre/Post Security)	sf	5,802	7,600	8,670	8,910	9,150	9,510
	Other Space/Amenity (Misc Tenant, Displays, Information counters, etc.)	sf	4,030	3,470	3,710	3,840	3,980	4,130
	Subtotal:		77,411	107,960	134,710	136,110	143,090	149,680
Airline Space								
		Units						
	Domestic Airline Space (Queue, Counter, ATO, BSO)	sf	11,368	5,280	6,040	6,040	6,290	6,540
	Other Airline Space (Bag Makeup, Laydown, Bag Screening, Airside Ops/Offices, Misc)	sf	33,203	24,230	28,800	29,520	30,620	36,950
	Subtotal:		44,571	29,510	34,840	35,560	36,910	43,490
Concessions								
	Landside Concessions (pre-Security)	sf	10,542	3,400	4,280	4,440	4,610	5,390
	Airside Concessions (post-Security)	sf	16,325	8,980	11,510	12,940	14,440	16,090
	Subtotal:		26,867	12,380	15,790	17,380	19,050	21,480
US Customs & Border Protection Services								
	Subtotal:		-	32,000	32,000	32,000	32,000	32,000
Non-Public Space								
	Non-Airline Tenant Space (Airport Admin/Support, Storage, Misc. Tenants)	sf	16,936	16,940	16,940	16,940	16,940	16,940
	Restrooms/Circulation	sf	540	6,120	6,800	6,910	7,070	7,770
	Airport Operations (Maintenance, Janitorial, Storage, Shops)	sf	8,417	4,100	4,820	4,900	5,100	5,430
	Building Systems (MEP, Communications/IT, Loading Docks, Structure)	sf	38,801	27,660	32,550	33,060	34,430	36,630
	Subtotal:		64,694	54,820	61,110	61,810	63,540	66,770
Total								
	Total Functional & Support Terminal Area³:		189,308	225,400	265,190	269,390	280,560	298,500
	Total Gross Terminal Area³:		213,543	236,670	278,450	282,860	294,590	313,420

¹Future areas considered Common Use

²Future area is consolidated CBIS/CBRA

³Represents the total available functional and gross terminal square footage (leased, non-leased, airport owned, and any vacant areas) and totals may not sum due to rounding

Sources: CMT Aviation Activity Forecast, September 2024 and Alliance Analysis

Appendix C

Airport Road and Air Freight Drive Traffic Study



Blue Grass Airport Airport Traffic Study

Draft Report

10/07/2025

Add project / document reference number





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Executive summary

This Traffic Impact Study (TIS) was conducted as part of the Blue Grass Airport Terminal Area Plan to evaluate the potential need for safety, operational, and control improvements in response to planned airport and adjacent developments. The study area includes key intersections surrounding Blue Grass Airport in Lexington, Kentucky, with a focus on accommodating future traffic demands generated by proposed infrastructure enhancements.

The study area comprises three intersections: one signalized intersection at Man O' War Boulevard and Terminal Drive, and unsignalized intersections at Man O' War Boulevard with Airport Road, and Airport Road with Air Freight Drive. Man O' War Boulevard and Terminal Drive serves as the main access point for passenger traffic to the airport terminal, while the other two intersections support internal traffic and freight-related operations and as a potential exit point for rental car drivers.

Six development concepts were evaluated:

1. Expansion of Airport Facilities
2. Relocation and expanded Rental Car Garage
3. Warehouse
4. Aviation Museum
5. Office Building (2 units)
6. Convenience Store/Gas Station

The proposed developments include a Rental Car Quick Turnaround (QTA) Facility; however, this development is not anticipated to generate traffic and therefore was not included in the evaluation.

Trip generation was estimated with the combined use of the ITE Trip Generation Manual (12th Edition), supplemental data from the Blue Grass Airport Master Plan, and site-specific contextual knowledge. Trips were distributed using existing traffic counts at nearby intersections to ensure consistency with observed network entry and exit volumes. Assumptions and adjustments to both generation and distribution of traffic are detailed in the Trip Generation and Distribution Methodology.

Miovision traffic data units were used at the key intersections during a typical weekday. The growth rates in the analysis were from the Master Plan. Forecasted traffic volumes for the design year 2040 were analyzed using Synchro 11 software to assess operational performance, including level of service (LOS), queuing, turn lane storage, and signal warrant evaluations.



The Synchro analysis shows three main points of failure in the network by the future scenario:

- Air Freight Drive left turn movement onto Airport Road
- Airport Road approach (storage) to Man O' War Boulevard
- Man O' War left turn onto Airport Road

The report presents findings for existing, existing + trip generation, and future conditions, and includes methodologies, trip generation assumptions, and recommended improvements. Once development specifics are finalized and approved, an additional analysis is necessary to more accurately determine the degree of the traffic impact and subsequent recommendation details.

Recommendations:

1. Man O' War Blvd at Airport Road:

- a. Construction of signal in conjunction with proposed developments
 - i. Consider the construction of a Continuous Green-T
 - ii. Additional analysis should be conducted to determine final lane configurations on each approach

2. Airport Road at Air Freight Dr:

- a. Consider reconstructing the northbound approach of Air Freight Drive to include a channelized right turn into an add lane (second lane) on Airport Road, or
- b. Reconstruct as a roundabout
 - i. Additional analysis should be conducted to determine final lane configurations on each approach

3. Airport Road:

- a. Widen in conjunction with intersection improvements
 - i. Determine most optimal configuration between dual left turn, extended right turn lane, or full-length add lane into the right turn lane on Airport Road

4. Terminal Drive:

- a. Re-evaluate signal operations and coordinate signals after Airport Road signal is constructed



Introduction

This TIS is purposed to evaluate the potential need for safety, operational, and traffic control improvements in response to planned developments within and around Blue Grass Airport. These developments include the expansion of airport facilities, relocation and enhancement of rental car parking, additional public parking, warehouse, a new Aviation Museum, construction of two office buildings and construction of convenience store/gas station. As these improvements are expected to significantly influence traffic patterns and volumes, a detailed assessment of current traffic conditions is essential to ensure safe and efficient operations throughout the study area.

The study area encompasses three key intersections: one signalized intersection at Man O' War Boulevard and Terminal Drive, and two unsignalized intersections at Man O' War Boulevard with Airport Road, and Airport Road with Air Freight Drive. The primary intersection at Man O' War Boulevard and Terminal Drive serves as the main access point for passenger traffic to the airport terminal, while the other two intersections primarily support freight-related operations.

This study involves a multi-faceted approach that includes traffic data collection, trip generation and distribution, traffic forecasting, and operational analysis. Traffic counts were collected using Miovision units at strategic locations during a typical weekday. Growth rates were provided by the Master Plan and were developed using historical traffic data maintained by the airport, ensuring consistency with long-term planning assumptions. Trip generation was conducted using the ITE Trip Generation Manual (12th Edition) and validated with observed counts from the Blue Grass Airport Master Plan to ensure realistic projections, particularly for high-volume developments.

Forecasted traffic volumes for the design year 2040 were analyzed using Synchro 11 software to evaluate intersection performance under existing, existing + trip generation, and future year (2040, including trip generated volume) conditions. The analysis includes level of service (LOS), queuing, turn lane adequacy, and signal warrant assessments to identify necessary improvements. The findings of this study will inform infrastructure planning and investment decisions to support the airport's continued growth and regional connectivity.

Study Area

The study area focuses on the primary access routes and intersections surrounding Blue Grass Airport in Lexington, Kentucky. These intersections are critical for both passenger and freight operations and are expected to experience increased traffic volumes due to proposed airport-related developments.

The study area includes the following three intersections, as illustrated in **Figure 1**:



Point A: Man O' War Boulevard at Terminal Drive

This is a signalized intersection and serves as the primary gateway to the Blue Grass Airport terminal. It experiences the highest traffic volumes in the study area and facilitates the majority of passenger vehicle access. Man O' War Boulevard in this segment is a four-lane, city-maintained Principal Arterial (Other).

Point B: Man O' War Boulevard at Airport Road

This unsignalized intersection provides access to airport support facilities and is a key route for service and freight vehicles, as well as a potential exit for rental car drivers.

Point C: Airport Road at Air Freight Drive

A two-way stop-controlled intersection internal to the Blue Grass Airport roadway network, this location supports freight-related operations, including cargo handling and distribution and Rental Car activities. Both Airport Road and Air Freight Drive are single-lane roadways.

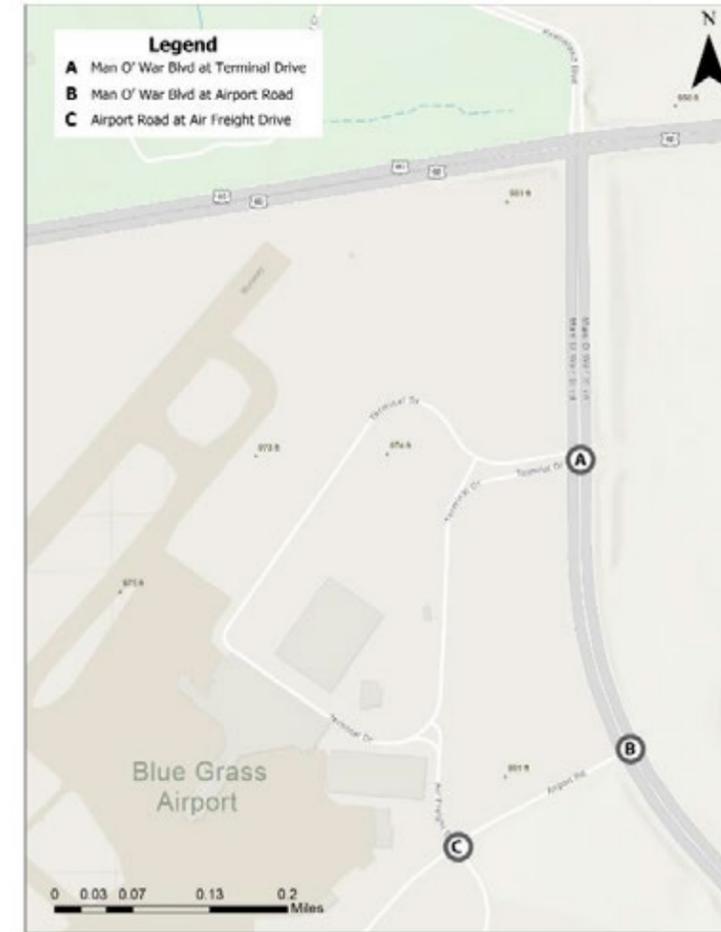


Figure 1: Study Area

Data Collection Methodologies

This chapter outlines the methodology used for collecting turning movement counts within the study area, which includes the following three intersections:

- Man O' War Blvd at Terminal Drive
- Man O' War Blvd at Airport Road
- Airport Road at Air Freight Drive



Turning movement data was collected using Miovision data collection units. To supplement the current data, WSP will request 48-hour count data from the Kentucky Transportation Cabinet (KYTC) for the most recent available year at surrounding count stations. This historical data will be used to develop a unified system-wide growth rate for forecasting future traffic conditions.



Trip Generation and Distribution Methodology

Trip generation was initially estimated using the ITE Trip Generation Manual (12th Edition) for all developments except for the rental car garage and airport improvements. Adjustments and/or assumptions were made regarding the final number of trips generated by some developments based on the purpose, function, or relationship of one development to another.

Trip Generation assumptions/adjustments:

- Airport expansion – The ITE Trip Generation Manual only had one other study in the sample. The suggested number of trips generated was more than 10x the existing traffic entering and exiting from collected counts. Therefore, existing counts internal to the Airport from the Master Plan were used as base trips. Finally, the percentage increase of enplanements (2.6% for the first year) was used to determine the number of new trips.
- Rental Car Garage – Similarly, using the ITE Trip Generation Manual, the number of trips expected from a rental car facility the same size as existing at the Blue Grass Airport far exceeds the number of collected counts from the Master Plan. Therefore, existing counts from the Master Plan and a proportional growth of the existing car rental spaces to proposed spaces were used to determine the number of generated trips. Additionally, counts from the Master Plan showed zero cars exiting the rental car garage in the AM Peak. As only 8 vehicles were observed entering the facility, 6 vehicles were used as entering the existing garage for more conservative evaluation.
- Warehouse – No additional considerations.
- Aviation Museum – No additional considerations
- Office Building (2 units) – No additional considerations
- Convenience Store/Gas Station – The ITE Trip Generation Manual generated an accurate number of vehicles for the convenience store/gas station development. However, based on the purpose of the fuel center (primarily for returning rental cars) and location (tucked into the airport property), only half of the generated volume was used in each peak.

These trips were then distributed through the network. Each development serves its own purpose, thus trips from each development were distributed either 1) proportionally to the existing counts entering/exiting the study area or 2) weighted based on the purpose of the development.



Trip Distribution assumptions/adjustments:

- Airport expansion – No additional considerations
- Rental Car Garage – Nearly 90% of traffic entering the rental car garage were routed to the fuel center entrance and back to the rental car garage.
- Warehouse – The small amount of traffic generated from the development was considered to proceed out of Lexington or to Keeneland and was therefore directed all north toward Versailles Road
- Aviation Museum – No additional considerations
- Office Building (2 units) – No additional considerations
- Convenience Store/Gas Station – Vehicles entering the rental car garage from the fuel center are already counted; therefore, remaining vehicles enter Airport Road from Man O' War and exit to Man O' War at proportional rates to existing counts.



Existing Conditions

Existing turning movement counts were collected for the analysis of current traffic operations. The counts were rounded and balanced, **Figure 2**, to maintain a more accurate evaluation of study area intersections throughout project scenarios.

AM and PM existing results from Synchro include volume-to-capacity (V/C), Delay, LOS, and Queue results are reflected in **Table 1** and **2**, respectively.

The existing analysis shows that the existing network operates within acceptable means at all intersections during both times of day. The eastbound approach of Airport Road shows an average delay per vehicle of ~35 seconds, or LOS D. The 95th percentile queue is ~½ of the current available storage.

12-hour counts were collected at the study area intersections. Based on Warrant 1 (8-hour Vehicular Volume) of the Signal Warrant Analysis, suggests that a signal is not currently warranted at Airport Road and Man O' War Boulevard, **Appendix A**. However, results of the warrant show that with only a minimal increase, fewer than 10 veh/hr for only three hours of a typical day, a signal may be warranted.

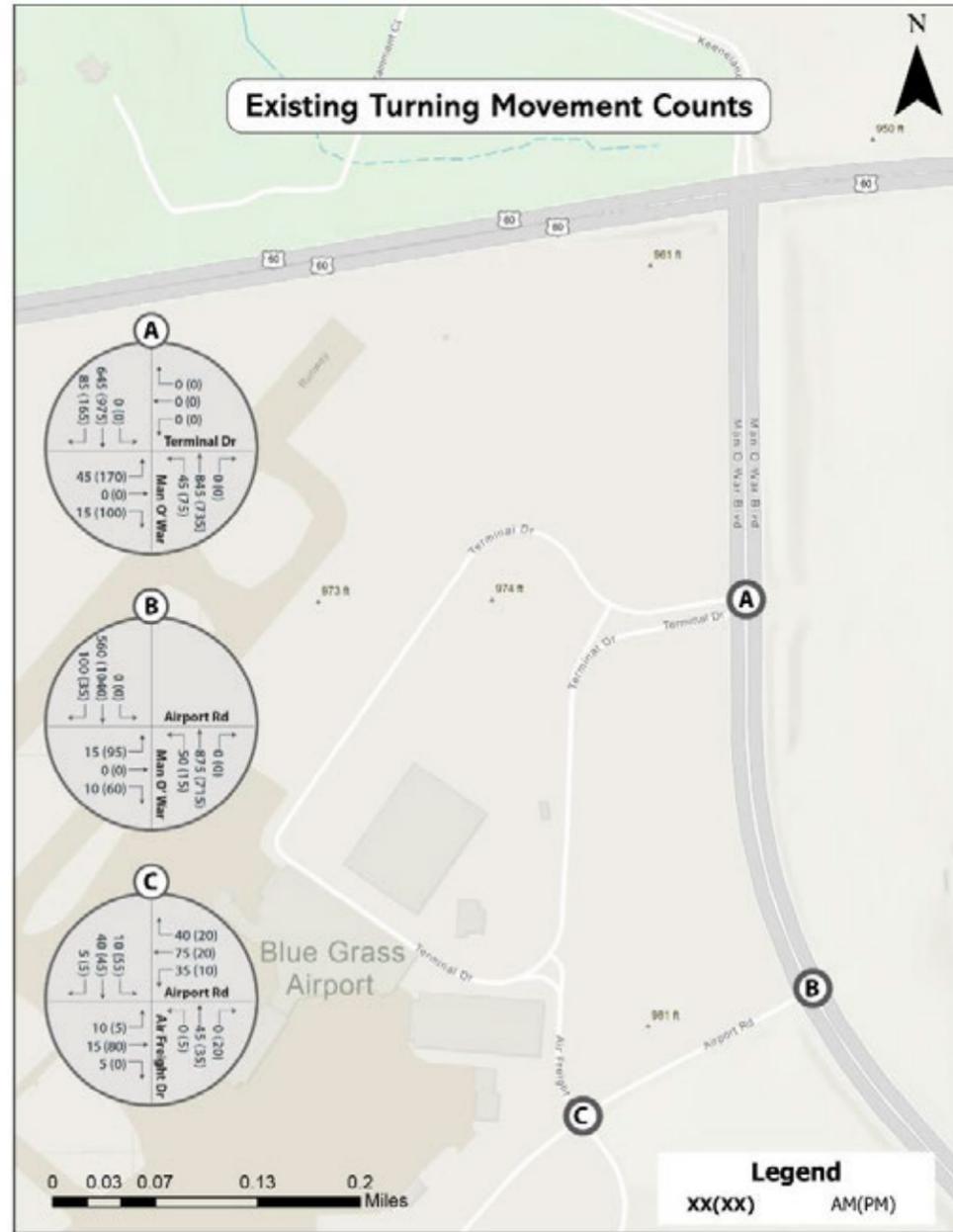


Figure 2: Existing Peak Hour Rounded and Balanced Turning Movement Counts



Table 1: Existing AM Operation Results

AM Existing					
Intersection Name	Approach	Movement	V/C	Delay	99th percentile queue (ft)
	EB	Left/Right	0.28	16.8	B 27
		Left	0.19	4.4	A 11
	NB	Thru	0.35	4.2	A 96
		Thru	0.41	11.5	B 136
	SB	Right	0.11	2.9	A 16
Man O' War Blvd at Terminal Dr		Intersection	0.41	7.8	A
	EB	Right	0.11	15.6	C 10
		Left	0.08	9.7	A 6
	NB	Thru	0.28	0	A 0
		Thru	0.22	0	A 0
	SB	Right	0.08	0	A 0
Man O' War Blvd at Airport Rd (Unsignalized)		Intersection	0.28	0.7	A
	EB	Left	0.02	3.1	A 1
		Thru	0.03	0.3	A 3
	WB	Right	0.03	2.7	A 3
	NB	Left/Thru	0.1	10.9	B 9
	SB	Left/Thru	0.15	11.9	B 13
Airport Rd at Air Freight Dr		Intersection	0.15	5.6	A

Table 2: Existing PM Operation Results

PM Existing					
Intersection Name	Approach	Movement	V/C	Delay	99th percentile queue (ft)
	EB	Left/Right	0.77	26.5	C 131
		Left	0.57	18.6	B 27
	NB	Thru	0.35	7.3	A 126
		Thru	0.78	22.6	C 292
	SB	Right	0.25	2.9	A 21
Man O' War Blvd at Terminal Dr		Intersection	0.81	17.7	B
	EB	Right	0.7	34.4	D 127
		Left	0.7	34.4	D 127
		Left	0.03	11.4	B 2
	NB	Thru	0.23	0	A 0
		Thru	0.4	0	A 0
SB	Right	0.03	0	A 0	
Man O' War Blvd at Airport Rd (Unsignalized)		Intersection	0.7	3.8	A
	EB	Left	0.01	0.7	A 1
		Left	0.01	0.1	A 1
	WB	Thru	0.01	2.7	A 1
	NB	Left/Thru	0.18	10.5	B 16
	SB	Left/Thru	0.3	13.7	B 32
Airport Rd at Air Freight Dr		Intersection	0.3	7.8	A



Existing + Trip Generation

An Existing + Trip Generation model was used to establish a baseline operation of the study area intersections while including the generated and distributed volumes before future growth is evaluated. Volumes were not rounded after being generated/distributed to maintain the true number of trips generated. Existing + Trip Generated volumes are shown in **Figure 3**. **Tables 3** and **4** highlight the results of Existing + Trip Generated model.

Calibration

In **Tables 3** and **4**, results at the two Airport Road intersections had to be calibrated in Synchro to extract resulting operations data without error. In Synchro, a V/C ratio over 1.0 for an approach of a stop-controlled intersection results in multiple metrics reading "Error." Therefore, Critical Gap and Follow Up Time parameters were adjusted to make driver behavior slightly more aggressive. It should be assumed, therefore, that the stop-controlled intersections fail to adequately operate during peak hours under existing + trip generation and future volume scenarios.

Table 4 shows that, even with more aggressive driving behavior, Air Freight Drive begins to experience extensive queuing and delay with trip generated volume added to the network. In the PM peak, at Man O' War and Airport Road, the Airport Road approach shows peak queuing nearing the extent of the right turn lane storage bay and 20 seconds of delay per vehicle. These results are more extensive with more conservative driver behavior.

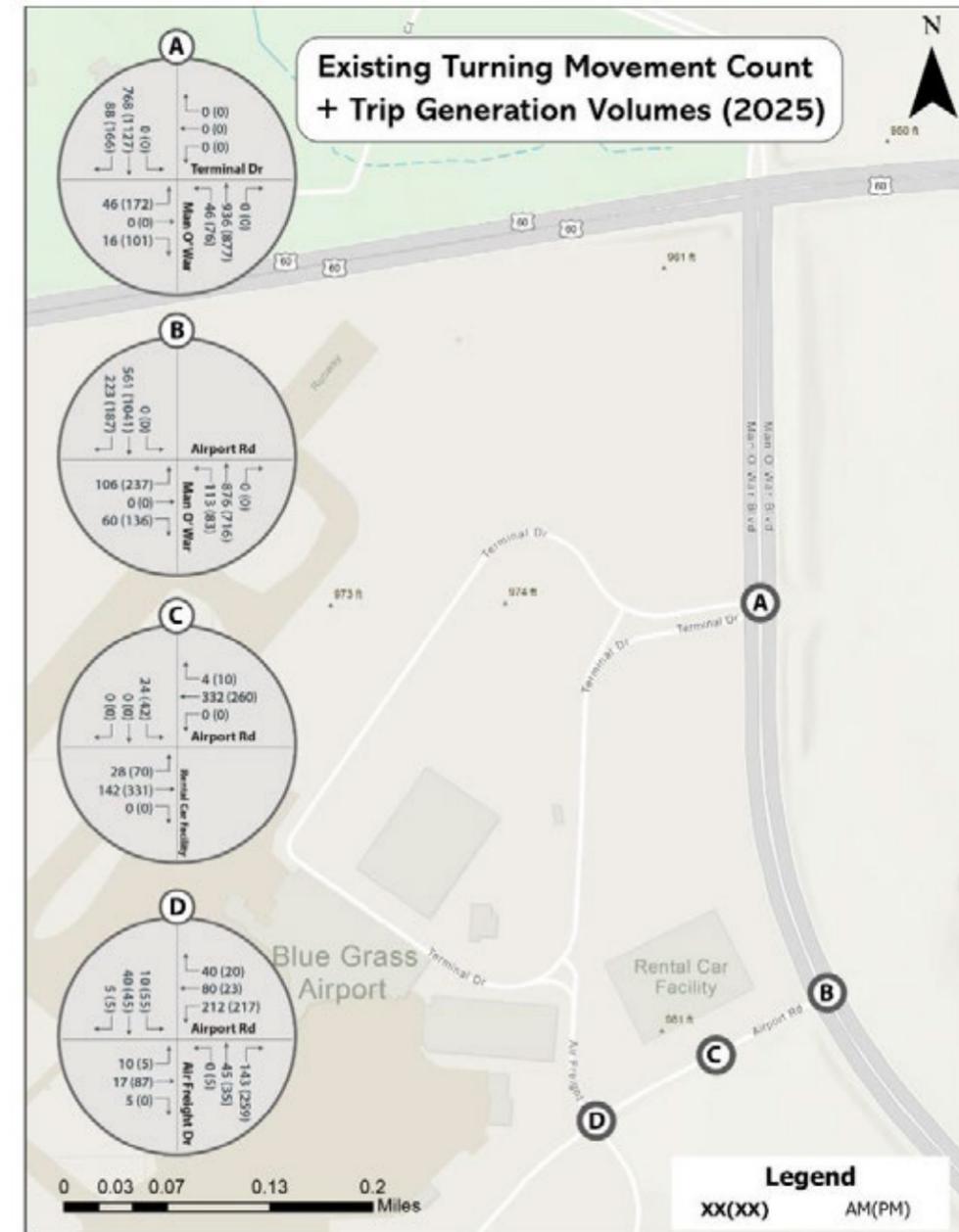


Figure 3: Existing Peak Hour + Trip Generated Turning Movement Counts



Table 3: Existing + Trip Gen AM Operation Results

AM Existing +Trip Generation Conditions						
Intersection Name	Approach	Movement	V/C	Delay	LOS	95th percentile queue (ft)
	EB	Left/Right	0.29	17	B	29
		Left	0.22	4.7	A	13
	NB	Thru	0.38	4.4	A	310
		Thru	0.48	12.2	B	458
	SB	Right	0.12	2.8	A	11
Man O' War Blvd at Terminal Dr	Intersection		0.48	8.3	A	
	EB	Left	0.27	10.7	B	27
		Right	0.27	10.7	B	27
	NB	Left	0.2	11.4	B	19
		Thru	0.28	0	A	0
	SB	Thru	0.22	0	A	0
Man O' War Blvd at Airport Rd (Unsignalized)	Intersection		0.28	1.9	A	
	EB	All	0.02	2.9	A	1
		Thru	0.02	1.7	A	19
	WB	Right	0.2	6.3	A	19
		All	0.28	7.2	A	28
	SB	All	0.12	10.7	B	11
Airport Rd at Air Freight Dr (Unsignalized)	Intersection		0.28	6.6	A	

Table 4: Existing + Trip Gen PM Operation Results

PM Existing +Trip Generation Conditions						
Intersection Name	Approach	Movement	V/C	Delay	LOS	95th percentile queue (ft)
	EB	Left/Right	0.79	28.3	C	137
		Left	0.59	20.1	C	27
	NB	Thru	0.42	7.8	A	157
		Thru	0.88	27.9	C	360
	SB	Right	0.25	2.9	A	21
Man O' War Blvd at Terminal Dr	Intersection		0.88	20.4	C	
	EB	Left	0.73	20.4	C	165
		Right	0.73	20.4	C	165
	NB	Left	0.22	14.6	B	21
		Thru	0.23	0	A	0
	SB	Thru	0.4	0	A	0
Man O' War Blvd at Airport Rd (Unsignalized)	Intersection		0.73	4.6	A	
	EB	All	0.01	0.6	A	1
		Thru	0.23	1.9	A	22
	WB	Right	0.23	7.7	A	22
		All	0.49	8.1	A	71
	SB	All	0.63	37.6	E	100
Airport Rd at Air Freight Dr (Unsignalized)	Intersection		0.63	10.2	B	



Future Year Scenarios and Analysis

Existing year traffic (including trip generated volume) was forecasted to 2040 to evaluate intersection operations and the potential need for future intersection/segment recommendations. The growth rates for this study, shown in **Table 5**, are the enplanement growth rates based on the expansion of Blue Grass Airport.

The 2040 forecasted volume is shown in **Figure 4**. **Tables 6** and **7** highlight the results of the 2040 model. PM results indicate that system failure is occurring through the network.

At Terminal Drive, the eastbound and southbound approaches are failing to operate adequately. Additional study of traffic patterns originating from Versailles Road (not part of this study) would be necessary to determine how the southbound approach may operate with the forecasted volume. The Terminal Drive approach is unable to serve demand under the existing configuration.

The two unsignalized intersections also experience failure, primarily at stop-controlled approaches, and the free-controlled left turn from northbound Man O' War onto Airport Road. As noted in the Existing + Trip Generation section, a traffic signal is warranted to control the demand of the intersection.

Table 5: Project Growth Rates

Year	Proposed Growth Rates
2026-2031	2.60%
2031-2036	2.30%
2036-2040	2.20%

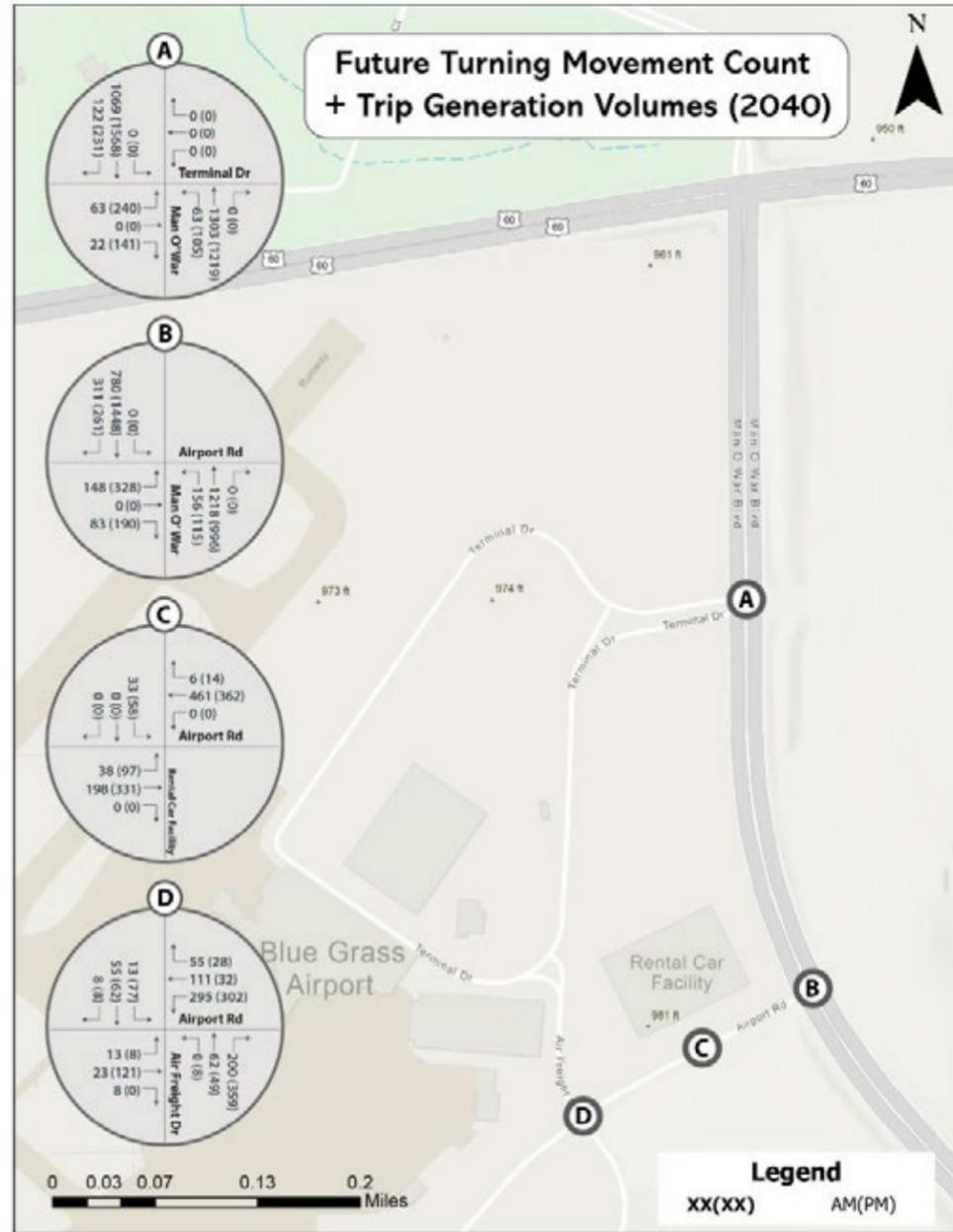


Figure 4: Future Peak Hour + Trip Generated Turning Movement Counts



Table 6: 2040 AM Operation Results

AM • Trip Generation Conditions (2040)						
Intersection Name	Approach	Movement	V/C	Delay	LOS	95th percentile queue (ft)
	SB	Left/Right	0.38	18.6	B	38
		Left	0.43	10.4	B	16
	NB	Thru	0.58	6.3	A	189
		Right	0.73	16.3	B	265
Man O' War Blvd at Terminal Dr			0.73	11.2	B	
	EB	Left	0.58	18.1	C	92
		Right	0.58	18.1	C	92
	NB	Left	0.37	15.6	C	43
		Thru	0.39	0	A	0
Man O' War Blvd at Airport Rd (Unsignalized)			0.58	3.1	A	
	WB	All	0.02	2.8	A	2
		Thru	0.29	2.6	A	30
	NB	Right	0.29	6.8	A	30
		All	0.42	8	A	54
Airport Rd at Air Freight Dr (Unsignalized)			0.29	16.4	C	29
			0.42	7.6	A	

Table 7: 2040 PM Operation Results

PM • Trip Generation Conditions (2040)						
Intersection Name	Approach	Movement	V/C	Delay	LOS	95th percentile queue (ft)
	SB	Left/Right	1.1	58.1	F	252
		Left	0.85	45.4	D	39
	NB	Thru	0.59	10.7	B	253
		Right	1.25	141.2	F	673
Man O' War Blvd at Terminal Dr			1.25	76.4	F	
	EB	Left	2.88	878.7	F	1909
		Right	2.88	878.7	F	1909
	NB	Left	0.68	51.1	F	107
		Thru	0.32	0	A	0
Man O' War Blvd at Airport Rd (Unsignalized)			2.88	180.3	F	
	WB	All	0.01	0.8	A	1
		Thru	0.33	3	A	36
	NB	Right	0.33	6.4	A	36
		All	0.77	12.6	B	217
Airport Rd at Air Freight Dr (Unsignalized)			2.82	822.4	F	608
			2.82	101.5	F	



Improvement Alternatives

The intersection of Airport Road and Man O' War is expected to operate at an acceptable LOS under existing + trip generated conditions. However, based on 8-hour traffic counts and the estimated volume increase outside of peak hours, **a signal is warranted for consideration to be constructed at Airport Road and Man O' War.** As a signal is not warranted currently, it is recommended to be constructed in conjunction with the airport developments. It is recommended to consider constructing the signal as a **Signalized-Continuous Green-T**, shown in **Figure 5**. This option would allow northbound traffic to continuously see green, even through the side street left turn phase.



Figure 5: Signalized Continuous Green-T Example

Along with the signal construction, Airport Road and Man O' War and Airport Road and Air Freight Drive should also be considered to receive improvements.

The Airport Road approach to Man O' War, is expected to experience a LOS F and a left turn queue that exceeds the available storage by 50-100 ft. even with a potential signal design. Though the right turn lane does not exceed the available storage, the left turn would likely prevent right turning vehicles from reaching the turn lane. This occurrence increases already excessive queuing (on a typical day) through the intersection of Airport Road and Air Freight Drive. Potential improvement alternatives include **increasing the right turn lane storage length** or **widening the Airport Road approach to become a dual left +**



right turn approach. Further evaluation is needed to determine which option is most sufficient due to the timing and future developments.

At Airport Road and Air Freight Drive, the proposed office spaces create the most negative impact operationally for the stop-controlled intersection. Potential recommendations include **reconstructing as a roundabout, Figure 6**, or **connecting the northbound approach to Airport Road as an add lane from a channelized right turn lane** (assumes a full, two-lane eastbound segment toward Man O' War), **Figure 7.**

At Terminal Drive, it is recommended to **re-evaluate the signal operation** after the Airport Road signal has been constructed. After such, coordination between the three signalized intersections is recommended to better control demand.

wsp



Figure 6: Roundabout Concept at Airport Road and Air Freight Drive

wsp



Figure 7: Right Turn Channelized Concept at Airport Road and Air Freight Drive



Appendices



Appendix A – Signal Warrant Analysis



KENTUCKY TRANSPORTATION CABINET
VEHICULAR VOLUME DISTRIBUTION SUMMARY

AM Date : 5/3/2022 Day : Tuesday Weather : Major St : MOW Blvd
 PM Date : 5/3/2022 Day : Tuesday Weather : Minor St : Airport Rd
 County : Fayette City : Lexington Remarks :

Start - Stop	From North			Total	From South			Total	From East			Total	From West			Total	TOTALS		
	Lt	St	Rt		Lt	St	Rt		Lt	St	Rt		Lt	St	Rt		N - S	E - W	Both
6:00 - 6:15	0	39	5		2	64	0					1	0	4					
6:15 - 6:30	0	34	8		1	101	0					0	0	0					
6:30 - 6:45	0	41	11		4	130	0					0	0	1					
6:45 - 7:00	0	71	25	234	4	128	0	434			0	2	0	3	11	668	11	679	
7:00 - 7:15	0	67	13		7	161	0					5	0	1					
7:15 - 7:30	0	88	14		10	204	0					3	0	0					
7:30 - 7:45	0	110	24		12	209	0					5	0	2					
7:45 - 8:00	0	186	32	534	16	230	0	849			0	1	0	5	22	1383	22	1405	
8:00 - 8:15	0	151	23		13	201	0					4	0	0					
8:15 - 8:30	0	115	20		9	234	0					7	0	4					
8:30 - 8:45	0	121	12		9	159	0					15	0	9					
8:45 - 9:00	0	116	13	571	12	125	0	762			0	12	0	7	58	1333	58	1391	
9:00 - 9:15	0	90	10		4	135	0					9	0	5					
9:15 - 9:30	0	89	4		6	117	0					5	0	8					
9:30 - 9:45	0	100	17		0	113	0					10	0	9					
9:45 - 10:00	0	98	12	420	7	104	0	486			0	9	0	4	59	906	59	965	
10:00 - 10:15	0	100	15		7	110	0					14	0	8					
10:15 - 10:30	0	103	6		7	112	0					8	0	6					
10:30 - 10:45	0	97	7		1	93	0					8	0	4					
10:45 - 11:00	0	95	10	433	1	102	0	433			0	7	0	5	60	866	60	926	
11:00 - 11:15	0	120	6		5	113	0					12	0	3					
11:15 - 11:30	0	102	8		3	104	1					12	0	12					
11:30 - 11:45	0	121	19		9	113	0					11	0	14					
11:45 - 12:00	0	106	12	494	6	131	0	485			0	10	0	8	82	979	82	1061	
12:00 - 12:15	0	106	15		10	122	0					18	0	12					
12:15 - 12:30	0	103	13		8	114	0					16	0	12					
12:30 - 12:45	0	147	12		13	158	0					12	0	12					
12:45 - 13:00	0	94	11	501	5	123	0	553			0	1	0	9	92	1054	92	1146	
13:00 - 13:15	0	92	13		6	110	0					4	0	5					
13:15 - 13:30	0	102	14		11	104	0					8	0	7					
13:30 - 13:45	0	101	8		9	127	0					8	0	17					
13:45 - 14:00	0	110	10	450	8	142	0	517			0	7	0	10	66	967	66	1033	
14:00 - 14:15	0	101	9		2	129	0					11	0	16					
14:15 - 14:30	0	99	7		9	141	0					10	0	8					
14:30 - 14:45	0	126	8		4	110	0					13	0	7					
14:45 - 15:00	0	130	4	484	5	138	0	538			0	13	0	15	94	1022	94	1116	
15:00 - 15:15	0	158	5		3	135	0					11	0	10					
15:15 - 15:30	0	135	10		7	178	0					9	0	8					
15:30 - 15:45	0	165	8		3	171	0					14	0	15					
15:45 - 16:00	0	175	10	666	2	184	0	683			0	10	1	8	84	1349	84	1433	
16:00 - 16:15	0	163	4		3	173	0					18	0	14					
16:15 - 16:30	0	173	12		4	176	0					7	0	8					
16:30 - 16:45	0	266	17		6	217	0					35	0	17					
16:45 - 17:00	0	277	7	919	5	178	0	762			0	13	0	15	127	1681	127	1808	
17:00 - 17:15	0	243	7		0	162	0					28	0	19					
17:15 - 17:30	0	253	2		4	157	0					17	0	7					
17:30 - 17:45	0	201	5		5	146	0					10	0	3					
17:45 - 18:00	0	173	7	891	2	154	0	630			0	9	0	3	96	1521	96	1617	
18:00 - 18:15	0	182	2		3	127	0					12	0	8					
18:15 - 18:30	0	148	4		4	155	0					8	0	8					
18:30 - 18:45	0	122	1		0	103	0					4	0	8					
18:45 - 19:00	0	107	1	567	0	119	0	511			0	10	0	5	59	1078	59	1137	
19:00 - 19:15	0	120	3		4	99	0					6	0	1					
19:15 - 19:30	0	109	2		1	82	0					5	0	8					

KENTUCKY TRANSPORTATION CABINET
NORTH-SOUTH LEFT TURN CROSS PRODUCTS

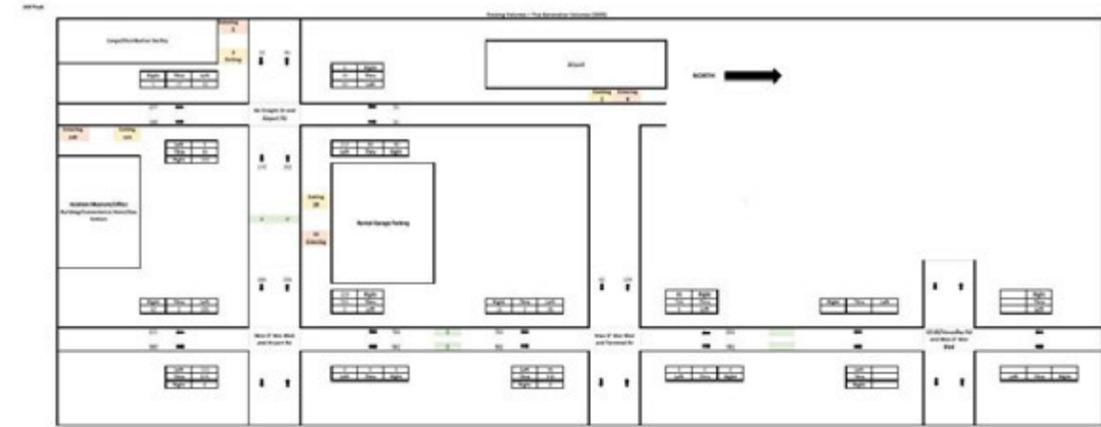
AM Date : Day : Tuesday Weather : 0 Major St : MOW Blvd
 PM Date : Day : Tuesday Weather : 0 Minor St : Airport Rd
 County : Fayette City : Lexington Remarks : 0

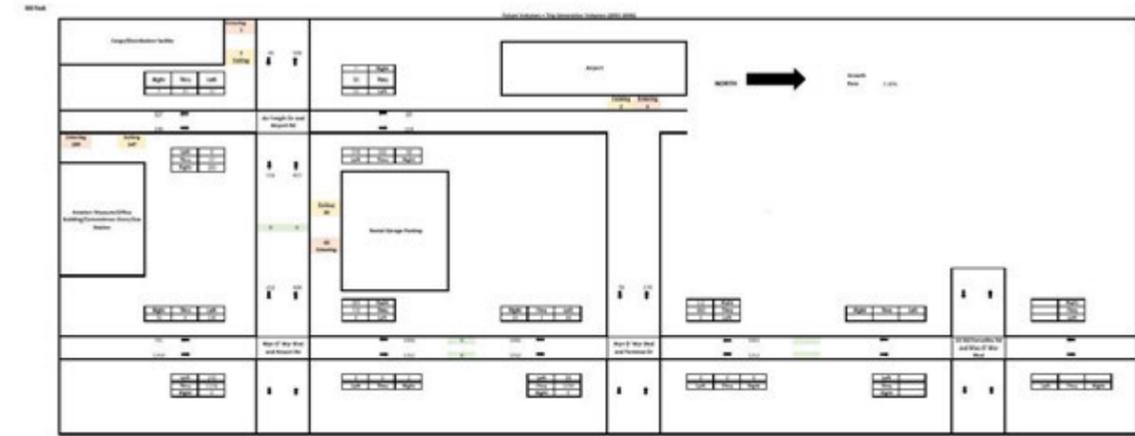
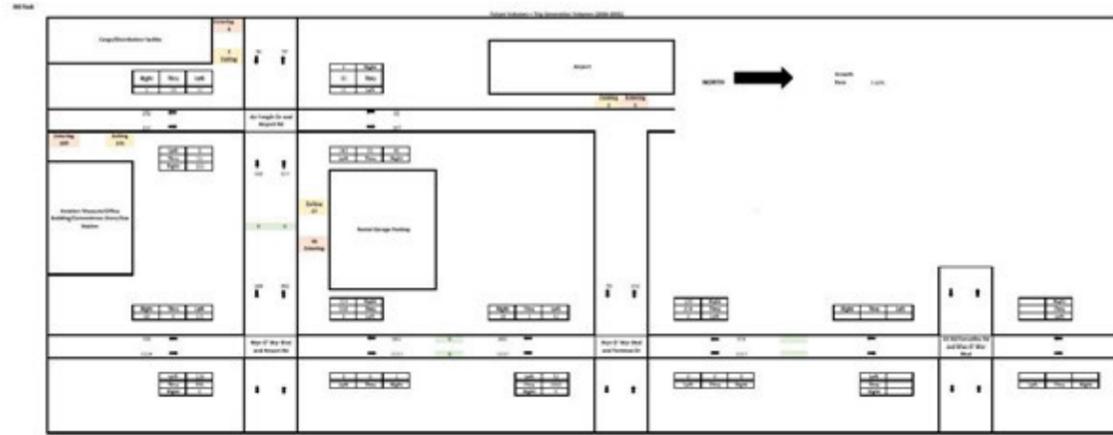
Start - Stop	From North			Total	From South			Total
	Lt	St	Rt		Lt	St	Rt	
7:00 - 7:15	0	67	13		7	161	0	
7:15 - 7:30	0	88	14		10	204	0	
7:30 - 7:45	0	110	24		12	209	0	
7:45 - 8:00	0	186	32	534	16	230	0	849
8:00 - 8:15	0	151	23		13	201	0	
8:15 - 8:30	0	115	20		9	234	0	
8:30 - 8:45	0	121	12		9	159	0	
8:45 - 9:00	0	116	13	571	12	125	0	762
9:00 - 9:15	0	90	10		4	135	0	
9:15 - 9:30	0	89	4		6	117	0	
9:30 - 9:45	0	100	17		0	113	0	
9:45 - 10:00	0	98	12	420	7	104	0	486
10:00 - 10:15	0	100	15		7	110	0	
10:15 - 10:30	0	103	6		7	112	0	
10:30 - 10:45	0	97	7		1	93	0	
10:45 - 11:00	0	95	10	433	1	102	0	433
11:00 - 11:15	0	120	6		5	113	0	
11:15 - 11:30	0	102	8		3	104	1	
11:30 - 11:45	0	121	19		9	113	0	
11:45 - 12:00	0	106	12	494	6	131	0	485
12:00 - 12:15	0	106	15		10	122	0	
12:15 - 12:30	0	103	13		8	114	0	
12:30 - 12:45	0	147	12		13	158	0	
12:45 - 13:00	0	94	11	501	5	123	0	553
13:00 - 13:15	0	92	13		6	110	0	
13:15 - 13:30	0	102	14		11	104	0	
13:30 - 13:45	0	101	8		9	127	0	
13:45 - 14:00	0	110	10	450	8	142	0	517
14:00 - 14:15	0	101	9		2	129	0	
14:15 - 14:30	0	99	7		9	141	0	
14:30 - 14:45	0	126	8		4	110	0	
14:45 - 15:00	0	130	4	484	5	138	0	538
15:00 - 15:15	0	158	5		3	135	0	
15:15 - 15:30	0	135	10		7	178	0	
15:30 - 15:45	0	165	8		3	171	0	
15:45 - 16:00	0	175	10	666	2	184	0	683
16:00 - 16:15	0	163	4		3	173	0	
16:15 - 16:30	0	173	12		4	176	0	
16:30 - 16:45	0	266	17		6	217	0	
16:45 - 17:00	0	277	7	919	5	178	0	762
17:00 - 17:15	0	243	7		0	162	0	
17:15 - 17:30	0	253	2		4	157	0	
17:30 - 17:45	0	201	5		5	146	0	
17:45 - 18:00	0	173	7	891	2	154	0	630
18:00 - 18:15	0	182	2		3	127	0	
18:15 - 18:30	0	148	4		4	155	0	
18:30 - 18:45	0	122	1		0	103	0	
18:45 - 19:00	0	107	1	567	0	119	0	511
TOTALS	0	109	2	0	1	82	0	0

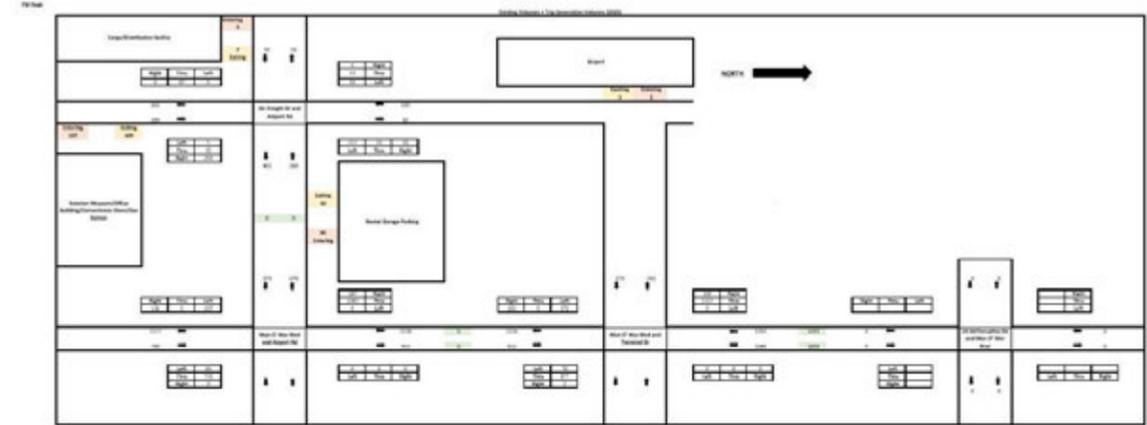
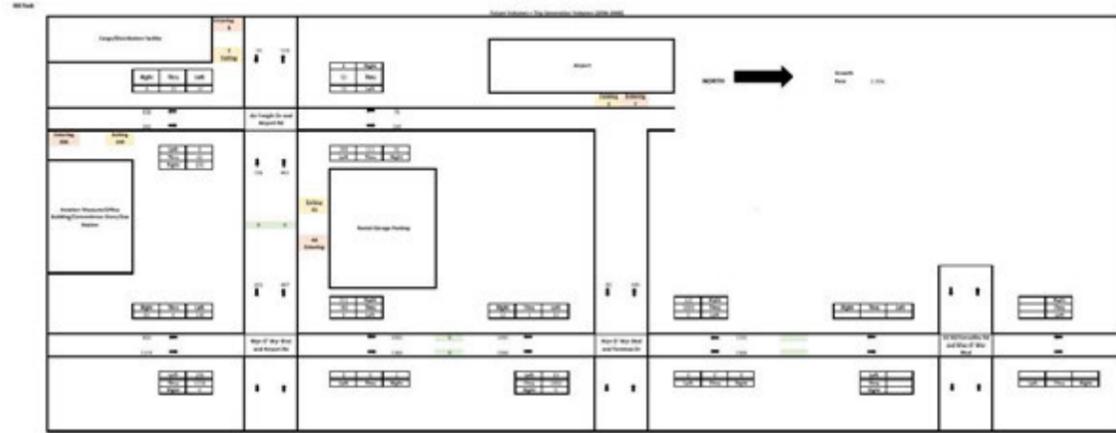
SB Left x NB Thru & Right	NB Left x SB Thru & Right	Greater Than 50K		Greater Than 100K	
		SB	NB	SB	NB
0	24030				
0	32028				
0	33050				
0	31020				
0	24553				
0	16898				
0	14105				
0	9658				
0	7140				
0	8700				
0	9471				
0	9636				
0	6928				
0	6216				
0	4450				
0	8658				
0	11362				
0	13692				
0	16335				
0	19018				
0	18036				
0	15520				
0	16975				
0	13485				
0	15300				
0	13650				
0	12460				
0	10810				
0	9680				
0	11277				
0	10944				
0	11070				
0	9990				

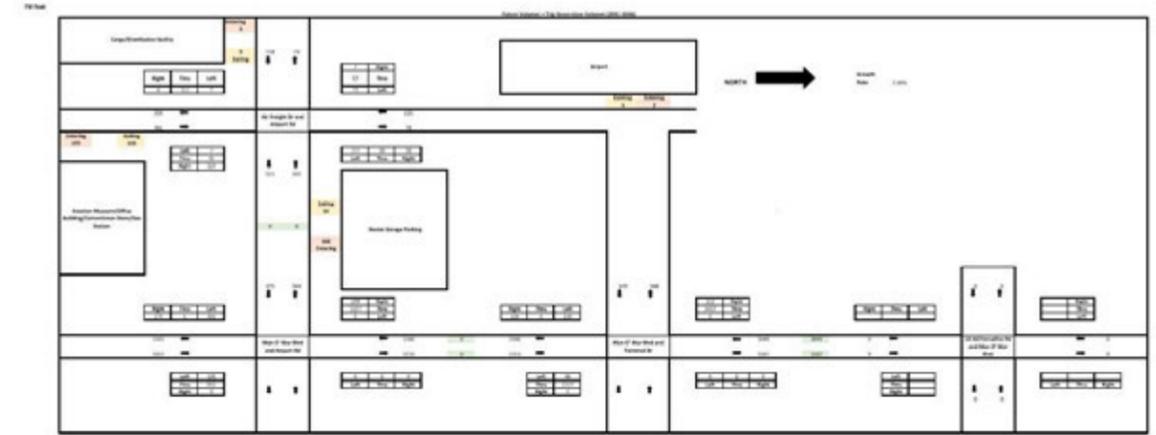
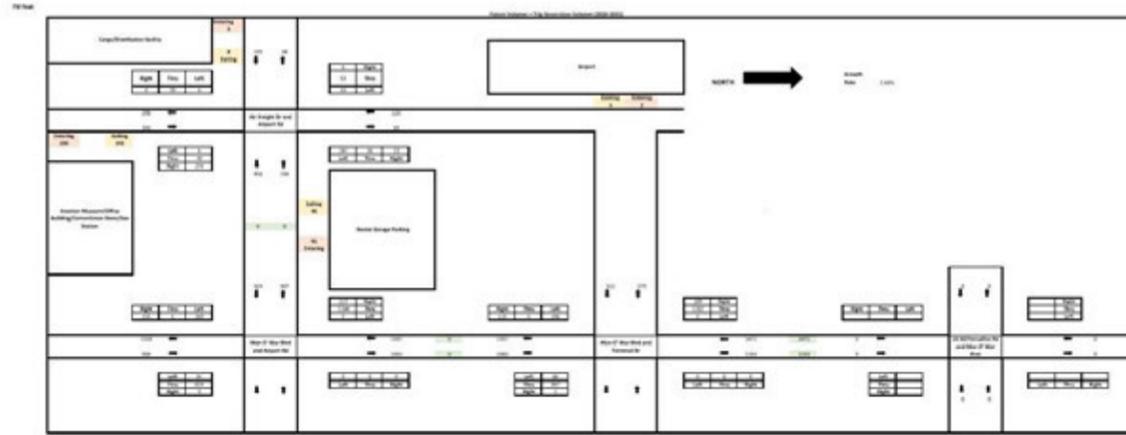


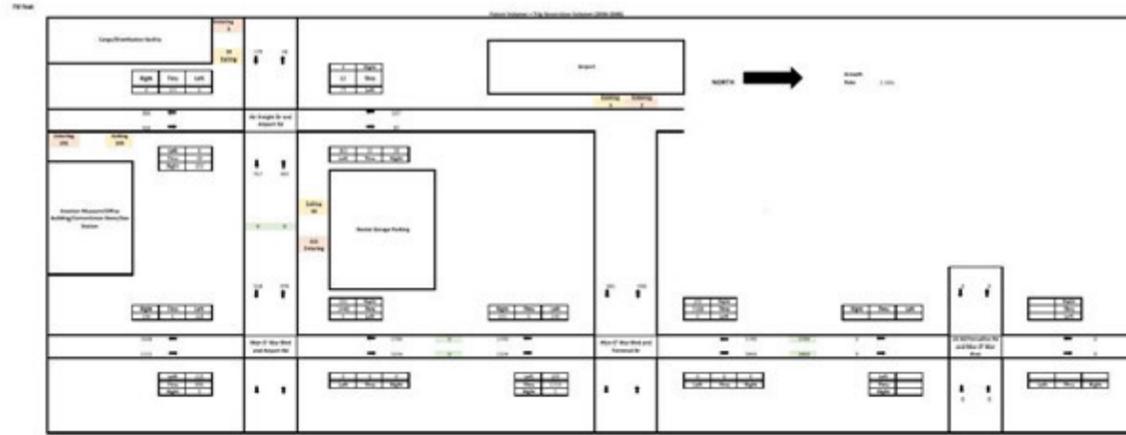
Appendix B – Trip Generation Tables











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Crawford, Murphy & Tilly