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Chapter 5 – Alternatives

This chapter explores alternative development concepts to meet the requirements presented in the previous chapters. Alternatives development focused on the terminal area, west service area, north airfield and south airfield. Development plans for the remainder of the airport will follow recommendations developed in the 2025 Master Plan, which will be described later in this chapter.

5.1. TERMINAL AREA
Terminal area alternatives addressed both landside (curbfront, roadways, parking and rental car facilities) and airside (terminal, apron, and taxilanes). Evaluation of terminal facilities included consideration of ownership costs as well as capital costs and other factors.

5.1.1. INITIAL CONCEPT DEVELOPMENT AND REFINEMENTS
Initial concept development was launched with a two-day charrette in May 2011 in which four teams of KCAB staff and consultants (Groups A, B, C, and D) were invited to explore concepts for terminal area development.

5.1.1.1. Process and Concepts
The group discussed the Master Plan goals and objectives, primarily focusing on the use of existing improvements correlating to the goals of being safe, smart and strong.

To ensure the concepts provided sufficient space for aircraft parking and maneuvering, passenger accommodation (including airline and concessions spaces), and ground access to the terminal, a conceptual forecast of demand was developed that included passengers per year in 2035, related facility requirements, and principal geometric relationships inherent in sound passenger facility design. Although subsequent forecast refinement and concept development modified these rough order-of-magnitude estimates, these preliminary criteria were suitable for the initial scoping exercise undertaken in the charrette.

Key preliminary assumptions and criteria used for initial planning included:

- Terminals 1 and 2 would be demolished by 2015, and Concourse C could be demolished by 2025 at the expiration of the current lease.
- Total enplaned passengers: 7 million annually in 2035.
- Originating passengers: 6 million per annum (i.e. Multi-Carrier or Dominant + LCC scenario).
- Gates: 49 A320-equivalent
- Terminal Building Area: 1,534,000 square feet, including FIS facility and gates for two simultaneous wide-body flights.
- Curbfront: 5,700 feet of usable length for arrivals plus departures, which could be reduced by a close-in CONRAC to eliminate busing. Usable curb length is defined to include the length of all lanes in which a vehicle is permitted to load or unload. By contrast, today there approximately 4,000 feet of usable curb length (including the Ground Transportation Center curb).
These broad-brushed sketches were discussed by the group in terms of evaluation criteria and the “best” concepts identified as those to be further developed.

Evaluation criteria considered factors related to:

- **Function** - airline operations, contact FIS facility, ease for ground transportation providers and rental car customers, and operational reliability that excluded capital or maintenance intensive systems.

- **Economy** – life cycle costs, parking structures to meet 95 percent of demand with self amortization in no more than three years, airside concessions area to optimize yield, no airline specific investment that cannot easily be reused by others.

- **Time** – in 2035 investments provide a balanced asset condition, ability to phase development to meet demand; flexibility to adapt to changes in demand

Given the very high level at which the concept development took place in the two day workshop; the participants agreed that detailed comparisons of the alternatives would not substitute for more detailed preparation and evaluation of concepts. Rather, participants used the guidance of the goals and objectives to develop alternatives that:

- Could be developed in phases in response to demand.

- Leveraged existing sound airport assets.

- Provided efficient facilities for passengers, airlines, and concessionaires.

- Did not force the removal of otherwise suitable existing facilities.

Figure 5 - 1, Figure 5 - 2, Figure 5 - 3, and Figure 5 - 4 depict CADD renderings of all of the May 2011 charrette concept sketches by group, and note those recommended for further refinement within each group. For those concepts selected for refinement, the groups explained potential phasing of development, indicated in the figures by various colors.

These concepts explored multiple terminals and checkpoints, various configurations of new and existing concourses, and in the case of Group B, two concepts for a new midfield concourse between Runways 18R-36L and 18C-36C. Group C sketched a concept that placed the terminal along the west service area and reoriented the landside to the west of the existing parking area. Several concepts substituted above-ground connectors for the tunnel and train. Many of the sketch concepts were eliminated by the charrette groups due to excessive cost, forced removal of existing facilities, or providing minimal gain in efficiency over concepts that balanced use of existing assets.

The participants agreed that the scale of the existing Terminal 3 main building and Concourse B and the general condition of the facilities lent themselves to continued maintenance and use. All concepts relied on the assumption that Terminals 1 and 2 and Concourse C could be removed before development of the concept.
Figure 5 - 1: May 2011 Charrette Group A Concepts

Source: Jacobs Engineering Inc., May, 2011
Figure 5 - 2: May 2011 Charrette Group B Concepts

Concept B1

Concept B2

Concept B3

Concept B4

Concept B4 – Selected for Refinement

Concept B5

Source: Jacobs Engineering Inc., May 2011
Figure 5 - 3: May 2011 Charrette Group C Concepts

Concept C-1

Concept C-2

Concept C-3

Concept C-4

Concept C-5

Source: Jacobs Engineering Inc., May 2011
Figure 5 - 4: May 2011 Charrette Group D Concepts

Concept D-1

Concept D-2

Concept D-3

Concept D-1 – Selected for Refinement

Source: Jacobs Engineering Inc., May 2011
5.1.1.2. Preliminary Evaluation

Concept families were reviewed and discussed by the charrette participants with focus on the evaluation criteria.

The Group A concept provides additional landside facilities by expanding Concourse A to the east and west, and utilizes the road that once served Terminals 1 and 2 for commercial access to the future terminal. FIS facilities would be constructed in a broad above-ground link, which could be a bridge or at grade, between the main terminal and Concourse A. Concourse A would be reconstructed over time. An option to further expand Concourse A or to retain Concourse B would provide the ability to phase construction in response to needs over time. Should the airport decide to abandon Concourse B and the train serving it, Concourse A expansion would provide the required gates. The concept lends itself to phased implementation, but poses some constructability challenges associated with redeveloping Concourse A and expanding the main terminal. This concept leverages existing assets while providing a balanced asset condition at the end of the planning period.

As with the Group A concept, the Group B concept adds landside facilities by expanding to the east and west, and retaining Concourse B. It assumes that Parking Garages 1 and 2 and the Terminal 2 bag claim building would be converted to a consolidated rental car facility for ready/return vehicles with quick turn-around elements. It also envisions an FIS facility in an elevated connector between Concourse A and Terminal 3, with direct pedestrian access to the terminal landside. The concept provides for phased reconstruction of Concourse A and provides for either continued use of the tunnel train to Concourse B or construction of an above-ground connection.

The concept lends itself to phased implementation, but poses some constructability challenges associated with redeveloping Concourse A and expanding the main terminal along with demolition of Terminals 1 and 2. The concept as depicted has more gate capacity than is required in 2035, resulting in more concourse than the landside would support with the assumed origination/destination traffic share. It also eliminates the ease of aircraft circulation by creating above-ground connections between concourses.

The Group C concept also adds gates by reconstructing Concourse A to the east and west, and retaining Concourse B for airline hub operations. Rental car facilities would be remote. The connector between Concourse A and the main terminal could house the FIS, with direct pedestrian access to the terminal and curbside. Terminal 3 would be expanded to the east and west, and both wings could accommodate contact gates. Dual taxiways would be created between terminal gates and Concourse A, requiring elimination of the roadway under the security building and pushing the AOA line to the north. The concept provides for phased reconstruction of Concourse A and anticipates continued use of the tunnel train to Concourse B. It poses some constructability challenges associated with redeveloping Concourse A, relocating the AOA line and expanding the main terminal.

The Group D concept varied from the other concepts by proposing a two-terminal solution with connecting concourses. Rather than expanding existing Terminal 3, this alternative proposed redevelopment of the sites now occupied by Terminals 1 and 2. The diagram suggests that the curb face of the new terminal would align with the corresponding face of Terminal 3, but participants did not feel this alignment was a specific requirement of the concept. Concourse A would be abandoned in favor of a pier-and-linear concourse scheme connecting the new...
terminal to Terminal 3. There is considerable flexibility in phasing of this concept. Concourse B would be retained, with continuing access via the train.

Providing two discrete landside interfaces presents surface access challenges similar to operations in previous years. However, the separation of two terminals was thought to be advantageous to security measures and to alternative airline business models for customer service. Since the construction of the new terminal would take place well in the future, the loss of garage 1 to the project might be mitigated by the age and condition of the garage. New parking facilities would be developed within walking distance of the new terminal.

Group D felt that this concept provided the airport flexibility for additional capacity when the need to remodel existing Terminal 3 arises, however at a steep cost. The timing of construction for the new terminal could be completed prior to the need for additional capacity at existing Terminal 3. The new terminal could be used as an “open chair” for temporary relocation of airline ticketing and baggage functions during Terminal 3 remodeling.

5.1.1.3. Refinement for Further Planning
Following the initial charrette, forecasts were revised and as a result, the requirements used in the initial planning were found to overstate demand. Therefore, additional concept right-sizing and refinement was required for all concepts moving forward into further evaluation.

Additionally, the charrette teams’ sketches typically satisfied demand beyond that which was estimated for the planning period, focusing on the airside layout and very little on the landside. Therefore, the initial refinement of these sketches by the planning team focused on right-sizing the airside and landside layouts to meet the updated forecast demand within the planning period so that concepts represented similar requirements and could be compared on an equal basis. Through this process, variations and improvements on the original four concepts were explored.

Through refinement of the concepts developed in the May 2011 charrette, additional airside concepts were created and paired with appropriate landsides. The Group A concept, which reconstructed Concourse A was developed in two variations:

- Concept A1 which reconstructed Concourse A in its current location to replace current Concourse A gates while retaining Concourse B.
- Concept A2 which reconstructed Concourse A to meet all gate requirements in a single linear concourse with dual taxi lanes between the concourse and Terminal 3.

A “business as usual” concept was also identified and labeled as Concept E. This concept retained Terminal 3 and Concourses A and B on the airside, with new development only on the landside.

The refined concepts are depicted in Figure 5 - 5.
Figure 5-5: Terminal Area Concepts Refined from May 2011 Charrette

Concept A1

Concept A2

Concept B

Concept C

Concept D

Concept E

Source: Jacobs Engineering Inc., May 2011
Through further development and evaluation, Concept D was eliminated from consideration because a second terminal and complete reconstruction of all gates wasn’t required. Concept B was also eliminated because it resulted in a very long transit distance for passengers from terminal to gates. All of the concepts retained, with the exception of Concept E (airside business as usual concept) balanced the age of assets by constructing some new facilities and retaining some existing.

5.1.2. FINAL AIRSIDE AND LANDSIDE CONCEPTS

Airside Concepts A1, A2, C and E for 2035 were further refined and paired with a variety of landside concepts which varied parking massing and phasing of development. Each concept was refined and evaluated in terms of:

- Implementation phasing – to meet demand, maintain constructability, minimize operational disruptions, and establish timing that avoids significant renovation costs for existing facilities.
- Estimate of probable cost at five year increments of development.
- Flexibility for gate utilization between airlines.
- Airside operational flexibility.
- Efficiency of landside traffic flow and wayfinding.
- Walking distances for passengers, landside and airside.
- Balance of new and existing facilities.

The Condition Index tool had identified significant renovation costs associated with both Terminal 3 and Concourse B in the 2025 to 2030 timeframe. (See Appendix XXX for more discussion.) Additionally, the renovations on Concourse A to consolidate airlines provided an additional ten years of service to the facility, according to KCAB staff. Therefore, timing for eliminating Concourses A and B to avoid major renovation were around 2022 and 2030, respectively. Terminal 3 was to remain in all concepts; therefore, renovation costs in the 2025 to 2030 timeframe were considered in terms of overall financial impact to development.

Through discussion with KCAB, Concept C was dropped due to the inefficiency of the single-loaded concourses adjacent to Terminal 3 and limitations to aircraft movement. In its place, a new concept – a variation of Group C, Concept C4 from the May charrettes which proposed a new v-shaped concourse – was proposed as a variation on a new build alternative. This became Concept F.

Three distinct landside configurations were developed to meet demand and vary parking massing, roadway configuration, and phasing. These were labeled as X, Y, and Z. The three landside configurations could be paired with nearly any of the airside configurations. Therefore, the final concepts were identified by their airside and landside components as:

- Airside A1, Landside X
- Airside A2, Landside Z
- Airside E, Landside Y
- Airside F, Landside X
Each of these, in the 2035 configuration, is depicted in Figure 5 - 6. Airside portion is considered from the face of the terminal to the airfield (terminal and concourses) while landside elements include curbfront, roads and parking.

**Figure 5 - 6: Final Airside and Landside Terminal Area Concepts, 2035**

Airside A1 – Landside X

Airside E – Landside Y

Airside A2 – Landside Z

Airside F – Landside X

Source: Jacobs Engineering Inc., April 2012

5.1.2.1. Airside Concepts

Airside concepts provide four variations to meet gate demand in 2035 and throughout the planning period. The following assumptions were applied to all concepts:

- The train is retained for the life of Concourse B.
- To be consistent with existing conditions, hydrant fueling would be constructed for new concourses and retained for renovated concourses. (Given that CVG is now and will be a medium hub airport, KCAB and the airlines may elect to eliminate the system for new construction alternatives in favor of truck loading.)
- Although Terminal 3 would not be expanded during this planning period, facility configuration should support expansion beyond the planning period.
- Terminals 1 and 2 would be demolished by 2015. Concourse C would be demolished after its lease expiration.
- FIS needs to be located as close to the terminal as possible to minimize bag recheck challenges for connecting international passengers.
- Baggage handling and screening system needs to be simplified from the existing system.
- Apron replacement for terminal reconstruction included the area required for redesign of grading and drainage which, at a minimum, would be the area inside the vehicle service roads including associated storm drainage system.

A. Airside Concept A1

Airside A1 retains Terminal 3 and most of Concourse B, and reconstructs Concourse A in its current location, but with a concourse extension to the west. The FIS would be relocated to the reconstructed Concourse A, and a surface-level connector would be constructed between the new central node of Concourse A and the security building. Concourses A and B would each house 18 gates. A portion of Concourse B not needed to meet demand would be demolished to reduce operating cost. Concourse C would be demolished by 2025. Future expansion beyond 2035 could be accomplished through expansion of Concourse A to the east and west.

Implementation phasing is shown in Figure 5 - 7, represented by the state of the facilities at the end of each five-year planning period. For example, 2015 represents facility changes from 2011 through 2015 and 2020 represents facility changes from 2016 through 2020. Facilities existing in 2011 which are demolished in later phases are shown in dashed lines for reference. Green indicates elements constructed during the period, while yellow indicates elements renovated during the period. For clarity, apron replacement is not shown.

A new west wing is added to Concourse A from the central core by 2020 and the east wing is demolished. By 2025, the central core, above-grade passenger connector from Terminal 3 and a new, shorter east wing are constructed in Concourse A. As well, and the baggage handling system screening matrix would be reconstructed in the area under the connector or in Terminal 3. Upon completion of the Concourse A gates, ten gates would be abandoned in Concourse B. Concourse B would be renovated by 2030 and a portion of the east wing demolished to eliminate overhead costs. Airside work would be completed by 2030.

A new FIS facility would be constructed in or adjacent to Terminal 3 and Security Building. International gates would be located on the Concourse A central core, close to the tunnel. One 15-foot-wide train guideway would be converted into a dedicated international passenger walkway to the FIS in Terminal 3. Bags would be carted to induction lines feeding carousels serving the FIS. International passengers would not claim bags until they entered the FIS area. For the small percentage of reconnecting passengers, the ticket counters and security checkpoint would be easily accessed. Likewise, terminating passengers could depart the FIS to the ground transportation center, curbfront, or parking garage.

Airside A-1 cost was estimated at $1.507 billion over the planning period, of which $823.5 million was the cost of implementation and the remaining $683.5 million was the cost of ownership.
Figure 5-7: Airside Concept A1 – Landside X Implementation

Airside A1 – Landside X: 2015
Airside A1 – Landside X: 2020
Airside A1 – Landside X: 2025
Airside A2 – Landside X: 2030
Airside A2 – Landside X: 2035

Source: Jacobs Engineering Inc., April 2012
B. Airside Concept A2

Airside Concept A2, as depicted in Figure 5 - 8, completely rebuilds Concourse A in a location further south from its current location to create dual Group III taxilanes between the new Concourse A and Terminal 3. New Concourse A is built out to replace all gates on Concourse B, after which Concourse B is demolished by 2030 and the train decommissioned. The tunnel could be left in service between Terminal 3 and Concourse A, and the baggage conveyance in the lower tunnel would continue to be used for transporting outbound bags to the concourse. Concourse C would be demolished by 2025.

An above-ground passenger walkway is shown between Terminal 3 and Concourse A; however, the underground walkway would also be reconnected to the central core, providing options for passengers and movement of concessions materials and other back-of-house goods. At least one of the two trains would remain in service until Concourse B is abandoned. Moving walks would be incorporated into the passageway and along the new concourse, which at build-out in 2030 would be approximately 2,700 feet long. Terminal 3 and the security building would be renovated in 2030.

In the period between 2020 and 2030, when the new Concourse A is in operation along with Concourse B, the location of Concourse A constricts aircraft passage between the concourses to dual Group III taxilanes or a single Group IV taxilane. Remaining operational aircraft gates in Concourse B would be located to the eastern end and south side of the concourse to minimize operational impacts between concourses. The duration of this restriction could be minimized to a period of 24 to 30 months if Concourse A construction were completed in a single project or a series of continuous projects. The south side of Concourse B would have no such restrictions, maintaining the existing dual Group IV taxilanes.

A new FIS facility would be constructed in or adjacent to Terminal 3 and Security Building. International gates would be located on the Concourse A central core, close to the tunnel. One 15-foot-wide train guideway would be converted into a dedicated international passenger walkway to the FIS in Terminal 3. Bags would be carted to induction lines feeding carousels serving the FIS. International passengers would not claim bags until they entered the FIS area. For the small percentage of reconnecting passengers, the ticket counters and security checkpoint would be easily accessed. Likewise, terminating passengers could depart the FIS to the ground transportation center, curbfront, or parking garage.

Future expansion beyond this configuration would be via extension of the west arm of the concourse or with a new concourse to the south from the central core.

Airside A-2 cost was estimated at $1.389 billion over the planning period, of which $819.7 million was the cost of implementation and the remaining $569.3 million was the cost of ownership.
C. Airside Concept E

Airside E represents “Business as Usual” for the airside in that existing facilities would be maintained and renovated. The FIS would remain in Concourse B. The baggage system would be modernized and the screening matrix would be upgraded and relocated to the Terminal 3 area, but its operational characteristics would not change in terms of bag transport and distribution. Additional baggage make-up units would be added to Concourse A, but distribution of bags to gates would continue in Concourse B. Inbound bags would be reinserted into the system for delivery to the appropriate claim device in Terminal 3. The train would remain in operation with required upgrades.

As shown in Figure 5 - 9, renovation would begin with Concourse B in 2020, and continue through 2030. Concourse A would be renovated by 2025, and the eastern end of the concourse would be removed to reduce the number of gates on Concourse A to ten. Terminal 3 and the security building would be renovated by 2035. Concourse C would be demolished by 2025.

Expansion beyond this concept could be accomplished through extension of Concourse A to the west or extension of Concourse B to the west. However, by 2035, Concourses A and B would be 48 and 41 years old, respectively. Due to physical and functional obsolescence, reconstruction would need to be weighed against expanding one of these concourses.

Airside E cost was estimated at $1.343 billion over the planning period, of which $635.0 million was the cost of implementation and the remaining $708.0 million was the cost of ownership.
Airside E – Landside Y: 2015

Airside E – Landside Y: 2020

Airside E – Landside Y: 2025

Airside E – Landside Y: 2030

Airside E – Landside Y: 2035

Source: Jacobs Engineering Inc., April 2012
D. Airside Concept F

Airside F is another new build concept, although the new facility takes the shape of a modified V rather than a linear concourse, as illustrated in Figure 5 - 10. Passengers would pass through the security checkpoint and remain at the same level to reach their gates. Moving walkways would assist travel throughout the concourses. From the split just south of the security building to the ends of the concourse, the west and east concourses are approximately 1,700 feet and 1,150 feet long, respectively. Concessions hubs would be located at the central hub and at the bends in each leg of the east and west concourses. A new FIS would be constructed as part of the new concourse, with international gates located at the fork of the V for the shortest walking distance to the FIS and for connecting passenger recheck. The new FIS would be opened between 2020 and 2025.

Airside construction would begin by 2020 creating 13 gates along the west wing of the new concourse and central connector to the Security Building. The baggage handling system screening matrix would be reconstructed either in Terminal 3 lower level or in the ground level of the central connector with delivery of bags to bag makeup units in the concourse(s). The eastern leg would be constructed by 2025 to increase the gate count to 29, reducing required gates on Concourse B to nine. Baggage conveyors and make-up units would be included in the east leg. Concourse C would also be demolished by 2025. In the final phase, the western leg would be extended to accommodate the remaining nine gates by 2030 and Concourse B would be demolished and the train decommissioned. Renovation of Terminal 3 and the Security Building would also be completed by 2030. No airside construction is shown after 2030.

The train would remain operational serving Concourse B passengers as long as aircraft gates remain operational in that concourse. However, prior to sealing the passenger exit to Concourse A, a new temporary emergency exit will have to be installed along the tunnel to meet fire safety codes. These codes specify the maximum distance that a tunnel may extend without exit to the surface. The exit could be placed under a small doghouse on the apron and cordoned off from aircraft and vehicular traffic with barriers, but needs to be placed so it does not interfere with taxilanes and aircraft parking.

Expansion beyond this plan could be accomplished by extending the eastern leg of the concourse to the south.

Operational flexibility would be more limited under Airside F than under the other concepts due to the shape of the concourse. Gates near the central connector may have long pushbacks and could block other traffic. However, the open V configuration is wide enough to allow remain overnight parking inside the V.

Airside F cost was estimated at $1.403 billion over the planning period, of which $822.7 million was the cost of implementation and the remaining $580.3 million was the cost of ownership.
Figure 5 - 10: Airside F – Landside X Implementation

Airside F – Landside X: 2015
Airside F – Landside X: 2020
Airside F – Landside X: 2025
Airside F – Landside X: 2030
Airside F – Landside X: 2035

Source: Jacobs Engineering Inc, April 2012
5.1.2.2. Landside Concepts

The three landside concepts were developed to serve all terminal-area destinations and originations, to simplify the landside system now that there would only be a single terminal, and to maximize the use of current landside elements that had a useful life for the duration of the planning period that did not require any but routine maintenance and paving. All landside concepts were similar in layout and features, but varied chiefly in the manner in which parking was massed and phased. Elements common to all concepts addressed deficiencies in existing layout of roadways and terminal access.

A. General Considerations

Based upon the analysis of terminal area roadways, some reconfiguration of the terminal entrance and exit and recirculation roads would be needed to improve flow and safety. These were considered in development of landside alternatives and included:

- The return to terminal ramp needs to be reconfigured or relocated to eliminate the stop intersection and corresponding need for shuttles to cross inbound traffic.
- Simplification of outbound Terminal Drive to improve lane continuity, eliminate weaving and lane changing, and provide safer merging for lane drops.
- Provide a multi-lane lane drop at the far end of the terminal curb roadways so that a single lane exits from the departures curb, the outer arrivals curb, and so the lane drops and forced merges on the roadways around the east end of Parking 3 would be eliminated and made safer.
- Eliminate the north entrance to the parking garages from outbound Terminal Drive to help reduce weaving.
- Route all large commercial vehicles, including delivery trucks away from the terminal roadway. This would include ensuring that these vehicles are not accessing the terminal curb frontage, as well as keeping these vehicles clear of the perimeter fence line.

Additionally, removing pedestrian crossings from the terminal curbfront would improve both capacity and safety. Capacity is especially important in later years as traffic volumes increase.

All concepts incorporated a close-in consolidated rental car (CONRAC) facility housing ready-return vehicles, a customer service center, and a quick turn-around area for servicing vehicles between rentals. Concepts varied in the size and location of the CONRAC within the terminal roadway. The footprint and number of levels were varied to vary the number of parking spaces to approximate demand for a combination of rental car and public parking at each PAL. Early concepts explored the reuse of the Terminal 2 Bag Building for a customer service facility, with the ready-return and QTA facilities being in Terminal 2 Garage and Terminal 1 Garage, respectively. This concept was dismissed based on the need for additional public parking within the terminal area, which could not be constructed if the CONRAC were built in the footprints of these facilities. A second option placed the CONRAC in a new facility north of the Terminal 3 Garage. This configuration had been studied in 2008, with a conceptual design prepared. While this concept located the CONRAC within a reasonable customer walking distance, there were other sites with shorter customer walk distances. As well, the need to walk through the parking garage was considered a detriment. In addition, the facility siting required relocation of the outbound terminal roadway so far north that a grade separated return-to-
terminal road was needed. This CONRAC location worked well with the 2025 Airport Master Plan terminal layout, but was not optimal to support the airside components and parking massing proposed in the current plan. However, expansion of the Terminal 3 Parking Garage in that location was explored in one of the landside alternatives.

Ownership costs were not calculated for landside facilities because demand-driven construction would require replacement of most of the older facilities to provide adequate parking and access within the terminal area.

B. Landside X

Landside X, as depicted in Figure 5 - 7, maintains the outbound terminal roadway from the parking garage, resurfacing and upgrading the roadway during the first phase. Outbound lanes would be restriped to reduce merges past the curbfront. By 2020, the inbound roadway would be realigned to route terminal traffic more directly to the curbfront and create a second, wider loop to serve the CONRAC and QTA which would be constructed west of Terminal 3. Because the new roadway alignment displaces the cell phone lot and multi-tenant cargo building those would need to be replaced. A new cargo building would be constructed in the west service area while the cell phone lot would be relocated adjacent to the CONRAC and QTA.

The five-level parking structure with a total of 4800 spaces would house both rental car facilities (ready/return parking, customer service area, and vehicle storage) as well as public parking on the upper levels. Passenger walkways would connect ticketing and baggage levels of Terminal 3 with the level coinciding with the customer service area located inside the CONRAC. Interior ramps would allow vertical circulation of vehicles in the structure. Provision would be made for upper level vehicle bridges to connect future parking structures north of the inbound terminal roadway. The QTA would be located adjacent to the rental car facilities and accommodate fueling, vacuuming, car wash and light maintenance in a surface lot with shade structures. Public parking would share the facility with rental cars through the planning period. The public parking utilization of the facility remains a large part of the CONRAC, occupying nearly 67% of the spaces in the first year and dropping to 65% in 2035.

By 2025, existing Garage 2 would be replaced by a new five-level structure with double helices serving New Garage 2 and Garage 3. The structures would be connected south of the helices allowing the two structures to act as a single garage. Vehicle bridges would be constructed on the upper levels to connect Garage 2 public parking to that in the CONRAC facility. A pedestrian connector would be added from the garages into the CONRAC pedestrian connector. Also during this period, the terminal curbfront and ground transportation center roads would be rehabilitated.

By 2030, a five-level addition would be made to Garage 2, with vehicle bridges connecting at upper levels to public parking in the CONRAC facility. In the final phase, from 2031 to 2035, the Terminal 3 garage would be renovated. This would include structural repairs and upgrades to conveyance systems, but would not add additional parking spaces to inventory.

Table 5 - 1 depicts the implementation of parking and CONRAC spaces to meet demand under each PAL. Rental car demand is met throughout the planning period by the initial construction, as indicated by green shading. Public parking demand is exceeded in all but the first period (shaded yellow) as the CONRAC is being constructed. Parking supply is overbuilt in the 2030 period, as indicated by the lavender shading. The Garage 3 expansion could be scaled back or phased to more closely meet incremental demand during this period.
## Table 5 - 1: Landside X Close-in Parking Implementation

<table>
<thead>
<tr>
<th>PAL / (Year)</th>
<th>Demand - Close-in Parking and Rental Cars</th>
<th>Projected Supply - Landside Concept X</th>
<th>Total Public Parking - All Facilities (Spaces)</th>
<th>Description of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public Parking (Spaces)</td>
<td>Employee Parking (1) (Spaces)</td>
<td>Total Public and Employee (Spaces)</td>
<td>CONRAC (2) (Spaces)</td>
</tr>
<tr>
<td>2011</td>
<td>4,876</td>
<td>703</td>
<td>5,579</td>
<td>-</td>
</tr>
<tr>
<td>PAL 1 (2015)</td>
<td>6,840</td>
<td>627</td>
<td>7,467</td>
<td>-</td>
</tr>
<tr>
<td>PAL 2 (2020)</td>
<td>8,673</td>
<td>705</td>
<td>9,378</td>
<td>1,307</td>
</tr>
<tr>
<td>PAL 3 (2025)</td>
<td>9,252</td>
<td>734</td>
<td>9,986</td>
<td>1,435</td>
</tr>
<tr>
<td>PAL 4 (2030)</td>
<td>9,877</td>
<td>764</td>
<td>10,641</td>
<td>1,549</td>
</tr>
<tr>
<td>PAL 5 (2035)</td>
<td>10,585</td>
<td>795</td>
<td>11,380</td>
<td>1,607</td>
</tr>
</tbody>
</table>

(1) Future accommodation of employees in terminal garages is on a space-available basis
(2) Includes ready/return, storage and staging. CONRAC requirements based on average of Multi-Carrier and Baseline scenario requirements
Source: Jacobs Engineering Inc, April 2012
C. Landside Y

Landside Y, as depicted in Figure 5 - 9, includes no new construction before 2015 when resources are focused on demolition of existing facilities. However, a substantial amount of work would be performed in the period from 2016 to 2020. Within that period, the inbound roadways would be realigned, the terminal curbfront and GTC roadways would be rehabilitated, the cell phone lot relocated, the QTA constructed and the CONRAC structure would be built to accommodate both rental car use and public parking.

The inbound roadway is not routed as far south as in Landside X, aligning with the security building to enter the CONRAC at the midpoint of its west side. Because the new roadway alignment displaces the cell phone lot and multi-tenant cargo building those would need to be replaced. A new cargo building would be constructed in the west service area while the cell phone lot would be relocated adjacent to the CONRAC and QTA.

The four-level parking structure with a total of 2,980 spaces, would house both rental car facilities (ready/return parking, customer service center, and vehicle storage) as well as public parking on the upper levels. Passenger walkways would connect ticketing and baggage levels of Terminal 3 with the level coinciding with the customer service area located inside the CONRAC. Interior ramps would allow vertical circulation for vehicles in the structure. Provision would be made for upper level vehicle bridges to connect future parking structures north of the inbound terminal roadway. The QTA would be located adjacent to the rental car facilities and accommodate fueling, vacuuming, car wash and light maintenance in a surface lot with shade structures. Public parking would share the facility with rental cars through the planning period. The public parking utilization of the facility drops from 59.6 percent in the first year to 35.4 percent at the end of the planning period.

By 2025, existing Garage 2 would be replaced by a new seven-level structure with double helices serving all seven levels of New Garage 2 and all five existing levels of Garage 3. The structures would be connected south of the helices allowing the two structures to act as a single garage. Vehicle bridges would be constructed on the upper levels to connect Garage 2 public parking to that in the CONRAC facility. A pedestrian connector would be added from the garages into the CONRAC pedestrian connector. To meet increasing rental car demand, 323 public parking spaces in the CONRAC would be reassigned for rental car use. Also during this period, the outbound terminal roadway would be renovated and remarked to reduce lane merges and improve safety.

By 2030, the Terminal 3 garage would be renovated. This would include structural repairs and upgrades to conveyance systems, but would not add additional parking spaces to inventory.

Table 5 - 2 depicts the implementation of parking and CONRAC for Landside Y by PAL. Public parking supply is slightly behind demand through 2020, indicating that the public parking portion of the CONRAC should be increased to provide adequate supply until new Garage 2 is opened. Public parking is overbuilt in 2025 and 2030 under this plan due to the size of new Garage 2, which could be scaled back or phased to better match growth of demand. By the end of the period, supply and demand are balanced.
### Table 5-2: Landside Y Close-In Parking Implementation

<table>
<thead>
<tr>
<th>PAL / (Year)</th>
<th>Demand - Close-in Parking and Rental Cars</th>
<th>Existing &amp; Future Public Garages</th>
<th>Projected Supply - Landside Concept Y</th>
<th>Total Public Parking - All Facilities (Spaces)</th>
<th>Description of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public Parking (Spaces)</td>
<td>Employee Parking (1) (Spaces)</td>
<td>Total Public and Employee (Spaces)</td>
<td>CONRAC (2) (Spaces)</td>
<td>Rental Car QTA (SF)</td>
</tr>
<tr>
<td>2011</td>
<td>4,876</td>
<td>703</td>
<td>5,579</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PAL 1 (2015)</td>
<td>6,840</td>
<td>627</td>
<td>7,467</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PAL 2 (2020)</td>
<td>8,673</td>
<td>705</td>
<td>9,378</td>
<td>1,307</td>
<td>332,798</td>
</tr>
<tr>
<td>PAL 3 (2025)</td>
<td>9,252</td>
<td>734</td>
<td>9,986</td>
<td>1,435</td>
<td>371,567</td>
</tr>
<tr>
<td>PAL 4 (2030)</td>
<td>9,877</td>
<td>764</td>
<td>10,641</td>
<td>1,549</td>
<td>391,604</td>
</tr>
<tr>
<td>PAL 5 (2035)</td>
<td>10,565</td>
<td>795</td>
<td>11,360</td>
<td>1,607</td>
<td>411,642</td>
</tr>
</tbody>
</table>

(1) Future accommodation of employees in terminal garages is on a space-available basis

(2) Includes ready/return, storage and staging. CONRAC requirements based on average of Multi-Carrier and Baseline scenario requirements

Source: Jacobs Engineering Inc, April 2012
D. Landside Z

Landside Z development is depicted in Figure 5 - 8. No new construction would occur prior to 2015 as resources are focused on demolition of existing facilities. By 2020, the inbound terminal roadway would be realigned, a CONRAC and QTA constructed, and a new cell phone lot constructed.

The inbound roadway realignment would route terminal traffic more directly to the curbfront and create a second wider loop to serve the CONRAC and QTA which would be constructed west of Terminal 3. Because the new alignment displaces the cell phone lot and multi-tenant cargo building those would need to be replaced. A new cargo building would be constructed in the west service area (prior to demolition of the existing building) while the cell phone lot would be relocated adjacent to the CONRAC and QTA.

The seven-level parking structure, with a total of 5,460 spaces would house both rental car facilities (ready/return parking, customer service area, and vehicle storage) as well as public parking on the upper levels. Passenger walkways would connect ticketing and baggage levels of Terminal 3 with the level coinciding with the customer service area located inside the CONRAC. Interior ramps would allow vertical circulation of vehicles in the structure. Provision would be made for upper level vehicle bridges to connect future parking structures north of the inbound terminal roadway. The QTA would be located adjacent to the rental car facilities and accommodate fueling, car wash, vacuuming, and light maintenance in a surface lot with shade structures. Public parking would occupy nearly 78 percent of the CONRAC structure at opening, decreasing to 64.7 percent at the end of the planning period.

A small parking area for staging commercial vehicles (chiefly taxis and limos) would be located between Terminal 3 and the CONRAC structure and served by creating two-way traffic under the Security Building from the GTC or from the inbound terminal roadway. This would replace the existing lot that would be lost with the CONRAC structure construction.

By 2025, existing Garage 2 would be replaced by a new five-level structure with double helices serving New Garage 2 and Garage 3. One of the helices would be located between Garages 2 and 3 while the other would be located on the northeast corner of Garage 3. The structures would be connected south of the helices allowing the two structures to act as a single garage. Vehicle bridges would be constructed on the upper levels to connect Garage 2 public parking to that in the CONRAC facility. A pedestrian connector would be added from the garages into the CONRAC pedestrian connector. Also during this period the terminal curbfront and ground transportation center roads would be rehabilitated.

By 2030, a five-level addition would be made to Garage 2, with vehicle bridges connecting at upper levels to public parking in the CONRAC facility. In the CONRAC, 150 public parking spaces would be reassigned for rental car use. From 2031 to 2035, the Terminal 3 garage would be renovated. This would include structural repairs and upgrades to conveyance systems, but would not add additional parking spaces to inventory. Also, the QTA is expanded.

Parking and CONRAC expansion by PAL is depicted in Table 5 - 3. Except for the initial period as the CONRAC is being developed, public parking supply would be increased ahead of demand. Parking is overbuilt in the later years (lavender shading), indicating that the full expansion of Garage 3 as shown could be reduced either by number of levels or footprint of the expansion.
<table>
<thead>
<tr>
<th>PAL / Year</th>
<th>Demand - Close-in Parking and Rental Cars</th>
<th>Projected Supply - Landside Concept Z</th>
<th>Total Public Parking - All Facilities</th>
<th>Description of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public Parking (Spaces)</td>
<td>Employee Parking (1) (Spaces)</td>
<td>Total Public and Employee (Spaces)</td>
<td>CONRAC (2) (Spaces)</td>
</tr>
<tr>
<td></td>
<td>Existing &amp; Future Public Garages</td>
<td>Future CONRAC Facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>4,876</td>
<td>703</td>
<td>5,579</td>
<td>-</td>
</tr>
<tr>
<td>PAL 1 (2015)</td>
<td>6,840</td>
<td>627</td>
<td>7,467</td>
<td>-</td>
</tr>
<tr>
<td>PAL2 (2020)</td>
<td>8,673</td>
<td>705</td>
<td>9,378</td>
<td>1,307</td>
</tr>
<tr>
<td>PAL 3 (2025)</td>
<td>9,252</td>
<td>734</td>
<td>9,986</td>
<td>1,435</td>
</tr>
<tr>
<td>PAL 4 (2030)</td>
<td>9,877</td>
<td>764</td>
<td>10,641</td>
<td>1,549</td>
</tr>
<tr>
<td>PAL 5 (2035)</td>
<td>10,565</td>
<td>795</td>
<td>11,360</td>
<td>1,607</td>
</tr>
</tbody>
</table>

(1) Future accommodation of employees in terminal garages is on a space-available basis 
(2) Includes ready/return, storage and staging. CONRAC requirements based on average of Multi-Carrier and Baseline scenario requirements
5.1.3. EVALUATION OF FINAL AIRSIDE AND LANDSIDE CONCEPTS

Evaluation criteria were developed with KCAB for use in ranking the airside and landside concepts. These incorporated earlier criteria, but were more detailed and specific. Criteria were weighted to reflect the importance to KCAB.

Evaluation criteria and final rankings with comments are shown in Table 5 - 4, and Table 5 - 5 for airside and landside concepts, respectively. Based on these evaluations, Airsides A-2 and F were closely ranked with the highest scores, followed by Airside A-1 and E. Landside Z was clearly ranked higher than either of the other two landside concepts.

The concepts and evaluations were discussed with stakeholders, including the airlines, Boone County Planning, rental car companies, and KCAB staff. Their comments differentiated Airside A2 from Airside F in terms of superior operational flexibility for aircraft movement in and around the concourse under Airside A2 – if the above-grade connector between Terminal 3 and the concourse were eliminated. Stakeholders felt that the above-grade connector on Airside A-2 was not necessary to customer service or efficient movement of passengers, and preferred to have the ability for aircraft to taxi all along the concourse. The “dead-end” taxilanes associated with the gates on the north side of Airside F concourse could create delays as aircraft pushed back into the taxilanes to exit gates. Likewise, the gates inside the open V were also thought to be less efficient for operations. Dual taxilanes on the north side of the new concourse in Airside A-2 would provide long-term benefit as opposed to single taxilanes as proposed in Airside A-1, allowing carriers more flexibility to operate different peaks. One airline representative pointed out that every element in a passenger’s experience can go well, but if the aircraft is delayed on pushback, that single problem cancels the positive experience up to that point.

Other discussion focused on location of the FIS facility and international gates. While the ideal location for this would be in Terminal 3 to allow quick recheck of bags for international connections and short walking distances for all international passengers, neither Airside A-2 nor F provided that opportunity. Airside F offers the closest location for international gates, near the fork of the V. However, larger aircraft using gates in that location could be restricted in pushback and maneuvering due to the parking angle along the legs of the concourse. Airside A-2 FIS location would require a longer walk from the concourse to the FIS in Terminal 3, although the bag claim at Customs would be in Terminal 3, so international passengers could make the walk from their arrival gate to the FIS unencumbered by checked bags. There was some discussion of creating an international gate off of Terminal 3; however, that would block one of the dual taxilanes between Terminal 3 and Concourse A when international flights were deplaning passengers.
Table 5-4: Airside Concept Evaluation

<table>
<thead>
<tr>
<th>Category</th>
<th>Weighting</th>
<th>AIRSIDE A1</th>
<th>Weighted Score</th>
<th>AIRSIDE A2</th>
<th>Weighted Score</th>
<th>AIRSIDE E</th>
<th>Weighted Score</th>
<th>AIRSIDE F</th>
<th>Weighted Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning Period Demand</td>
<td>12%</td>
<td>5</td>
<td>0.60</td>
<td>7</td>
<td>0.84</td>
<td>2</td>
<td>0.24</td>
<td>10</td>
<td>1.20</td>
</tr>
<tr>
<td>Future Demand (Beyond 2035)</td>
<td>6%</td>
<td>4</td>
<td>0.24</td>
<td>7</td>
<td>0.42</td>
<td>4</td>
<td>0.24</td>
<td>10</td>
<td>0.60</td>
</tr>
<tr>
<td>Customer Service</td>
<td>16%</td>
<td>6</td>
<td>0.96</td>
<td>8</td>
<td>1.28</td>
<td>5.5</td>
<td>0.88</td>
<td>9</td>
<td>1.44</td>
</tr>
<tr>
<td>Flexibility</td>
<td>12%</td>
<td>8</td>
<td>0.96</td>
<td>8</td>
<td>0.96</td>
<td>5.5</td>
<td>0.66</td>
<td>7</td>
<td>0.84</td>
</tr>
<tr>
<td>Economic</td>
<td>18%</td>
<td>7</td>
<td>1.26</td>
<td>7</td>
<td>1.26</td>
<td>6.5</td>
<td>1.17</td>
<td>4.5</td>
<td>0.81</td>
</tr>
<tr>
<td>Condition of facilities</td>
<td>11%</td>
<td>6</td>
<td>0.66</td>
<td>7</td>
<td>0.77</td>
<td>6</td>
<td>0.66</td>
<td>6</td>
<td>0.66</td>
</tr>
<tr>
<td>Safe &amp; Efficient Operations</td>
<td>15%</td>
<td>6.5</td>
<td>0.98</td>
<td>8</td>
<td>1.20</td>
<td>8.5</td>
<td>1.28</td>
<td>7</td>
<td>1.05</td>
</tr>
<tr>
<td>Environmental and Sustainability</td>
<td>5%</td>
<td>9</td>
<td>0.45</td>
<td>5</td>
<td>0.25</td>
<td>8</td>
<td>0.40</td>
<td>6</td>
<td>0.30</td>
</tr>
<tr>
<td>Security</td>
<td>5%</td>
<td>10</td>
<td>0.50</td>
<td>10</td>
<td>0.50</td>
<td>10</td>
<td>0.50</td>
<td>10</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>Total Airside A1</td>
<td>6.61</td>
<td>Total Airside A2</td>
<td>7.48</td>
<td>Total Airside E</td>
<td>6.03</td>
<td>Total Airside F</td>
<td>7.40</td>
</tr>
</tbody>
</table>

Source: Jacobs Engineering Inc., April 2012
## Table 5 - 5: Landside Concept Evaluation

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Rating</th>
<th>Weighting</th>
<th>Score (1-10)</th>
<th>Weighted Score</th>
<th>Score (1-10)</th>
<th>Weighted Score</th>
<th>Score (1-10)</th>
<th>Weighted Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planning Period Demand</strong></td>
<td></td>
<td>12%</td>
<td>7</td>
<td>0.84</td>
<td>7</td>
<td>0.84</td>
<td>8</td>
<td>0.96</td>
</tr>
<tr>
<td>Meets demand with high level of service for passengers, tenants, and other users</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Future Demand (Beyond 2035)</strong></td>
<td></td>
<td>6%</td>
<td>8</td>
<td>0.48</td>
<td>8</td>
<td>0.48</td>
<td>7</td>
<td>0.42</td>
</tr>
<tr>
<td>Allows for future incremental expansion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Customer Service</strong></td>
<td></td>
<td>16%</td>
<td>5.5</td>
<td>0.88</td>
<td>6.5</td>
<td>1.04</td>
<td>6</td>
<td>0.96</td>
</tr>
<tr>
<td>Provides high level of customer service to local and visiting travelers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flexibility</strong></td>
<td></td>
<td>12%</td>
<td>5</td>
<td>0.60</td>
<td>5</td>
<td>0.60</td>
<td>6.5</td>
<td>0.78</td>
</tr>
<tr>
<td>Reserves KCAB's ability to incrementally expand to meet demand without over-commitment of resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Economic</strong></td>
<td></td>
<td>18%</td>
<td>6.5</td>
<td>1.17</td>
<td>6.5</td>
<td>1.17</td>
<td>7</td>
<td>1.26</td>
</tr>
<tr>
<td>Maintains strong financial health within financial capacity while balancing capital and renovation costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Condition of facilities</strong></td>
<td></td>
<td>11%</td>
<td>7.5</td>
<td>0.83</td>
<td>7.5</td>
<td>0.83</td>
<td>7.5</td>
<td>0.83</td>
</tr>
<tr>
<td>Provides balanced assets, maintaining facility condition through continuous and timely renewal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operations</strong></td>
<td></td>
<td>15%</td>
<td>6</td>
<td>0.90</td>
<td>6</td>
<td>0.90</td>
<td>8</td>
<td>1.20</td>
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<tr>
<td>Promotes safe and efficient operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Environmental and Sustainability</strong></td>
<td></td>
<td>5%</td>
<td>7</td>
<td>0.35</td>
<td>7.5</td>
<td>0.38</td>
<td>7</td>
<td>0.35</td>
</tr>
<tr>
<td>Minimizes or avoids environmental impacts and supports sustainability goals such as energy reduction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td></td>
<td>5%</td>
<td>7</td>
<td>0.35</td>
<td>7</td>
<td>0.35</td>
<td>7</td>
<td>0.35</td>
</tr>
<tr>
<td>Supports existing and anticipated security measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Landside X</strong></td>
<td></td>
<td></td>
<td>6.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Landside Y</strong></td>
<td></td>
<td></td>
<td>6.58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Landside Z</strong></td>
<td></td>
<td></td>
<td>7.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Jacobs Engineering Inc., April 2012
Stakeholders overwhelmingly supported Landside Z based on its expansion of Garage 3 to meet public parking demand. KCAB staff had concerns regarding the financial feasibility of replacing the cargo building to allow inbound roadway expansion in early years of the plan. Expansion of Garage 3 was appealing in providing additional close-in parking; however, the outbound roadway realignment needs to be configured to retain the Police Station. Entry to the Police Station could be relocated to the north side with some remodeling of the facility, which would be favorable to replacing the entire building. Rental car companies and other stakeholders agreed with the close-in CONRAC which would eliminate busing to remote facilities and open up the GTC for other uses. The need for the commercial vehicle and taxi lot between Terminal 3 and the CONRAC was questioned given availability of the GTC for other commercial vehicle pick-up and staging. Finally, there was support for evaluating whether Garage 3 expansion could be maximized and constructed early in the planning period to offset the need for public parking in the CONRAC. If public parking were to be included in the CONRAC, it would most likely be a specialty parking product (valet, frequent parkers, and employees) rather than being open to the general public. Wayfinding from the helix to the upper floors to this parking area would be confusing; therefore, if the garage could operate as a stand-alone facility, wayfinding internal to the garages could be simplified and the vehicle bridges between upper levels of the CONRAC garage and Garage 2 could be eliminated.

5.1.4. PREFERRED AIRSIDE AND LANDSIDE CONCEPT

Through discussion with KCAB and stakeholders related in the previous section, the preferred concept was determined to be a combination of Airside A-2 and Landside Z. Airside A2 was preferred because it:

- Provides greater operational flexibility
- Right-sizes the facility for anticipated space and operational needs
- Meets customer service goals of ease of access to gates
- Allows flexibility to maintain current operations (“Airside Business as Usual” as illustrated by Airside E) for a number of years, allowing CVG time to evaluate demand and facility conditions that would indicate the airside redevelopment should be undertaken

Landside Z was preferred in terms of:

- Flexibility to meet demand incrementally without overbuilding
- Providing the greatest amount of parking and rental car ready/return closest to the terminal

A number of modifications to this concept were identified during the discussions with KCAB and stakeholders, which were addressed during the refinement stage. These include:

- Eliminate above grade connector between Terminal 3 and new Concourse A
- Determine the best location for FIS area and international gates and evaluate pathways for passenger movement to the FIS facility from the gates
- Revise inbound roadway alignment to retain the existing cargo facility, recognizing that replacement will be needed later in the planning period
• Revise the outbound roadway alignment to maximize expansion of Terminal 3 Garage while retaining the Police Station and accommodating the return to terminal roadway U-turn in the Donaldson Road right-of-way at Airport Boulevard. The Police Station parking lot could be replaced on the north side of the facility.

• Evaluate parking phasing to determine whether the expansion of Garage 3 can be accomplished early in the planning period to reduce or eliminate public parking in the CONRAC facility, while still meeting parking demand.

• Evaluate the need for the commercial vehicle and taxi lot between Terminal 3 and the CONRAC in light of the GTC availability with opening of the CONRAC.

5.1.5. SELECTED TERMINAL ALTERNATIVE

As the terminal area alternatives were discussed and evaluated, a number of refinements to the selected concept were identified as needed to better fit the development plan to the Airport's requirements. These include planning modifications to the proposed terminal expansion, the inbound and outbound roadways, and the parking expansion, as discussed below.

A. Terminal Expansion Refinements

Figure 5 - 11 depicts the preferred terminal area development concept, which evolves from the current configuration (the “Airside Business as Usual” concept). Condition assessments and cost of ownership analysis found that significant investments should be expected in Concourses A and B in approximately 2025 and 2030, respectively. Therefore, alternatives evaluated replacement or renovation of those facilities in those timeframes. Until then, airside facilities can continue to serve passenger needs, following the “Airside Business as Usual”. If facility conditions warrant, the planning and design of a new Concourse A would begin at the end of the Near Term (2016 – 2025) with construction to follow. The new concourse would replace existing Concourses A and B, which would be demolished as the new concourse is completed.

In the preferred concept, the east wing of Concourse A would be shortened to retain flexibility for aircraft movement and parking around the east end of the concourse, generally maintaining the current clearance from concourse end to apron edge. Gate capacity removed from the east wing was replaced on the west wing.

The above-grade walkway from Terminal 3 to Concourse A shown in earlier concepts was eliminated to improve aircraft movement around the future concourse. Passengers would continue to access future Concourse A via the existing subsurface tunnel. The train is proposed to be decommissioned with the elimination of Concourse B, and moving walkways upgraded. The central core of future Concourse A was also proposed to be shifted to the east to improve connectivity to vertical circulation from the exiting tunnel.

The concourse location is proposed to be shifted south slightly from previous concepts to allow dual Group III taxilanes (with taxiway clearance) between the concourse and the Air Operations Area (AOA) fenceline on the south side of the CONRAC, reserving space for an airside vehicle service road south of the AOA fence. This location also allows for dual Group III taxilanes between most of Concourse A and B during construction.
Once initiated, construction of the new concourse is envisioned to continue through completion, allowing Concourse B to be demolished by 2030 as additional gate capacity is added to Concourse A. Timing for initiation of new Concourse A construction was moved out to 2026 for planning purposes. However, facility conditions will continue to be monitored to determine whether initiation of more specific planning and design to begin the proposed development plan is warranted. The Airport has the flexibility to adjust implementation based on changes in demand, facility conditions, and financial considerations.

Demolition of Concourse B is proposed to include removal of the vertical structure, hydrant fueling system and full depth aircraft parking apron within the existing VSR. Once the demolition is completed the remaining void would be back filled, drainage system added and grass planted. A single Group IV taxilane is proposed to be constructed across the grass Infield to provide aircraft access between the terminal apron and Taxiway J. Parking for diverted aircraft during storm events (Irregular Operations or IRROPS) and aircraft remaining overnight away from an aircraft gate can be accommodated at the Concourse C site following demolition of that facility, which is proposed prior to the demolition of Concourse B.

The FIS facility is proposed to be located in an area of terminal expansion on the east side of the Terminal 3 security screening building. The Master Plan proposes that one of the trainways...
would be converted into a secure walkway with moving walks, for arriving international passengers from international gates in Concourse A to walk to the new FIS in Terminal 3.

B. Roadway Configuration Refinements

The inbound roadway realignment is proposed to be reconfigured to retain the existing multi-tenant cargo building. Although the revised alignment slightly reduces the area within the terminal roadway loop, it reduces overall demolition costs in the near-term and maximizes the use of existing facilities.

An access-controlled commercial vehicle (CV) road is envisioned south of the CONRAC. The roadway could also be utilized by emergency vehicles responding to events in the CONRAC or Terminal 3. The operating intent would be to limit regular traffic on this road to taxis and limos since a portion of the road will be shared with rental car returns. Access control (gates with transponders) would be installed after the split from the rental car road to limit access to authorized vehicles, and, if desired, to track usage for contractual purposes. Taxis and limos would use this to access to the staging area just west of Terminal 3, removing them from the terminal roadway until called for pick-up. They would exit to the terminal curbfront when called for pick-up (in the case of taxis) or when they had met their passengers and were departing the airport (in the case of limos). Other commercial vehicles would typically pick up and drop off in the GTC, utilizing the east entrance via Lincoln Road, which would also be access-controlled.

As proposed, two-way traffic could be allowed under the security building as an alternate route for flexibility to feed the staging area if the CV road were closed for maintenance or an unforeseen event. The westbound traffic would be free-flow into the staging lot, and would not impact traffic exiting the CONRAC. Eastbound CV road traffic would cross the CONRAC exit road with a STOP control, allowing rental cars to have the right-of-way and free-flow out of the CONRAC. The few CVs that exit the staging lot back onto the eastbound roadway would come to a STOP control or a merge.

A traffic analysis of the STOP controlled intersection was performed for PM peak hour in PAL 5 (2035) using these operational planning assumptions. As envisioned, the CONRAC traffic would not stop, resulting in a Level of Service A, with no delays. Taxis and limos would experience an average delay of 15.1 seconds at the intersection, which is a Level of Service C. Given the total travel time from remote staging to this lot, the delay is considered insignificant. If routed from Lincoln Road through the GTC with westbound free flow into the staging lot, taxi and limo delays could be even lower.

As the CONRAC is designed and KCAB develops its ground access allocation plan, the roadway layout and operational characteristics should be reevaluated and may be modified from the operation and geometrics proposed in the Master Plan.

The Outbound Terminal Road alignment is proposed to be reconfigured to retain police building although parking will need to be replaced on the north side of the police building. The roadway was extended across the drainage area to provide an ultimate parking garage expansion envelope capable of meeting forecast demand beyond 2035.

The parking exit plaza is proposed to be relocated from the middle of Garage 3 with a north exit, to the east end of the garage with an east exit. The at-grade roadway would exit the east side of Garage 3 and would proceed northwest in a dedicated lane until it aligns and merges with the at-grade section if Outbound Terminal Road.
C. Parking Expansion Refinements

Parking phasing and implementation evolved throughout the Master Plan as various alternatives were weighed against demand, cost and flexibility of expansion. The preferred alternative proposes a flexible and cost effective solution that includes reserving the top three of six levels in the CONRAC for 1,650 public parking spaces. As parking demand grows, outbound roadway realignment is proposed and Garage 3 expansion would be completed, followed, when needed by Garage 2 reconstruction/expansion. The final expansion configurations are recommended to maximize the potential future parking capacity in the terminal area. Garage 3 expansion would create 3,150 additional spaces. New Garage 2 would contain 4,200 spaces, replacing the current Garage 2 with 1,500 spaces, for a net gain of 2,700 spaces.

Table 5 - 6 shows the progression of public close-in parking capacity increase vs. demand for the selected terminal area concept. Green shading indicates that capacity is greater than demand; yellow shading indicates that demand slightly exceeds capacity; and lavender indicates that capacity is significantly greater than demand. In this case, consideration should be given to designing the expansion of Garage 2 to better balance with demand. While beneficial to keep the seven levels of structure, the proposed footprint would probably be reduced or construction delayed to avoid over-building.

5.2. WEST SERVICE AREA

The buildings in the West Service Area are some of the oldest on the airport. A January 2012 facilities assessment by Michael Schuster Associates (MSA) identified specific deficiencies in the various facilities which were recommended for repair with continued use. Demolition and redevelopment will proceed as new tenants and uses are identified for the area. The only such near-term demand identified in this Master Plan is to support FedEx relocation from Terminal 1, either through replacement of the existing cargo building with a new multi-tenant facility or construction of a consolidated sort facility. KCAB will evaluate other buildings on a case-by-case basis, weighing continued maintenance costs against possible rental revenue and other factors. As such, concepts for the West Service Area provide overall guidance for future development options rather than presenting a layout of facilities needed for demand within this planning period.

Utilities, which are also aging and subject to failures, should be replaced. This would typically accompany facility redevelopment, however since there is little facility redevelopment anticipated in the near term, utility replacement should be done as a stand-alone project to support the proposed roadway grid and land use anticipated with redevelopment.

Two concepts were developed for overall redevelopment of the West Service Area. Both create an additional north-south roadway west of Loomis Road to support more efficient redevelopment of the area. The first, Concept A, as shown in Figure 5 - 12, incorporated a replacement facility for FedEx which would allow them to consolidate their sort activities on-airport. The second, Concept B, as shown in Figure 5 - 13, was a mix of multi-tenant cargo, General Aviation (GA) and other facilities. In both concepts, the majority of the existing rental car service areas are maintained, along with the New Post Office, and some other facilities currently in use. A future service station is proposed north of Donaldson Road.
## Table 5-6: Public Close-In Parking Implementation

<table>
<thead>
<tr>
<th>PAL / (Year)</th>
<th>Demand - Close-in Parking and Rental Cars</th>
<th>Projected Supply - Selected Terminal Area Concept</th>
<th>Total Public Parking - All Facilities (Spaces)</th>
<th>Description of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public Parking (Spaces)</td>
<td>Employee Parking (1) (Spaces)</td>
<td>Total Public and Employee (Spaces)</td>
<td>CONRAC (2) (Spaces)</td>
</tr>
<tr>
<td>2011</td>
<td>4,876</td>
<td>703</td>
<td>5,579</td>
<td>-</td>
</tr>
<tr>
<td>PAL 1 (2015)</td>
<td>6,840</td>
<td>627</td>
<td>7,467</td>
<td>-</td>
</tr>
<tr>
<td>PAL2 (2020)</td>
<td>8,673</td>
<td>705</td>
<td>9,378</td>
<td>1,307</td>
</tr>
<tr>
<td>PAL 3 (2025)</td>
<td>9,252</td>
<td>734</td>
<td>9,986</td>
<td>1,435</td>
</tr>
<tr>
<td>PAL 4 (2030)</td>
<td>9,877</td>
<td>764</td>
<td>10,641</td>
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<tr>
<td>PAL 5 (2035)</td>
<td>10,565</td>
<td>795</td>
<td>11,360</td>
<td>1,607</td>
</tr>
</tbody>
</table>

(1) Future accommodation of employees in terminal garages is on a space-available basis, so not considered in calculation of close-in parking demand.

(2) Includes ready/return, storage and staging. CONRAC requirements based on average of Multi-Carrier and Baseline scenario requirements

Source: Jacobs Engineering Inc., October 2012
Figure 5-12: West Service Area Concept A

Source: Jacobs Engineering Inc., April 2012
Figure 5 - 13: West Service Area Concept B

Source: Jacobs Engineering Inc., April 2012
Concept A creates a new dedicated facility for FedEx, allowing FedEx to consolidate into a “6K” sort facility on the north end of the West Service Area. The main sort building straddles the landside/airside boundary. Aircraft parking for four MD-11 aircraft would be accommodated on the airside with landside parking for 250 vehicles (to accommodate shift changes and customers), 40 truck docks and the same number of truck/trailer staging spaces. Additional GSE parking and staging area would be provided south of the employee parking. This layout is based on standard facility plans provided by FedEx.

The FedEx facility and other development areas would be accessed via a new through roadway parallel to and west of Loomis Road. This new road would curve around the proposed alignment of the inbound terminal roadway to serve additional multi-carrier cargo facilities south of the FedEx building. It would connect to the inbound terminal road to provide circulation for emergency and service vehicles.

Areas identified as future aviation-related development could accommodate a variety of such uses including cargo or small distribution facilities, aircraft maintenance, or other functions that do not require direct access to the airfield.

Terminal 1 is planned for demolition by 2015. Originally, and as illustrated in Figure 5-11, the inbound roadway alignment would have eliminated the existing multi-tenant cargo building, requiring early replacement for existing tenants. Although the inbound roadway realignment was modified to retain the existing cargo building, this concept was retained as an alternative for early construction of a new multi-tenant cargo facility while not impacting the current facility and retaining a stand-alone site for FedEx.

In this concept, the first element to be constructed would be the multi-tenant cargo facility furthest to the south, along with a temporary access road. It is located to retain access to the existing cargo building until those tenants could be relocated to the new facility along with FedEx. The FedEx stand-alone facility could not be constructed before Terminal 1 demolition. Tenant relocation would allow demolition of the old cargo building, Terminal 1 concourse, and terminal roadway realignment. Remaining facilities could be constructed as demand dictated.

After construction of the CONRAC, the rental car companies may be able to consolidate their service operations into a smaller footprint. West Service Area Concept A shows the rental car service area reduced in size to eliminate the south parcel where Hertz is now located. This parcel could become a cell phone lot, replacing the existing lot. This location would be accessed by Loomis Road, either from Donaldson or from Terminal Drive. This location is sized to accommodate vehicle inspection under heightened security threat levels. Three concerns were addressed with this location: awkward turn from Terminal Drive into the lot versus wayfinding directing traffic from Donaldson and along Loomis; short stacking distance from the lot exit along Loomis to the intersection at Terminal Drive; and uncertainty of whether the rental car companies would readily consolidate into smaller spaces. Therefore, this cell phone lot location was not preferred.

Disadvantages of this concept include requiring a double move for FedEx to a facility which will require a significant amount of temporary construction for access until the final roadway configuration can be completed. Consolidating FedEx into a larger sort facility in the West Service Area would significantly increase truck and vehicle traffic on Donaldson Road in the terminal area. Although this concept shows an additional multi-tenant cargo building between
FedEx and the initial new cargo building, this area could be utilized for GA or base operator (FBO) use if that demand were to be identified.

Concept B does not include a consolidated FedEx facility, but instead proposes two multi-tenant air cargo facilities on the north end of the apron. Truck docking and staging as well as public and employee parking would be provided landside while the airside would accommodate aircraft parking. Similar to Concept A, Concept B has a new central spine road west of and parallel to Loomis Road, a service station north of Donaldson Road, and similar areas designated for future aviation-related development. Rental car maintenance and cell phone lot configurations are also similar to Concept A.

Unlike Concept A, development along the airside would be comprised of corporate and FBO facilities – hangars, offices and parking – with a KCAB support facility on the south end. The latter could be receiving, operations, or maintenance, or some other function that required access to the airfield and landside. While there is not a latent demand for corporate or FBO facilities, this location close to the terminal area would allow access to terminal services that the current GA location in the south airfield does not enjoy.

The advantage of Concept B is that one multi-tenant cargo facility could be constructed early, using the existing apron, for relocation of FedEx and the other cargo building tenants. Investment would be minimized through the re-use of existing parking and apron areas. Other facilities could be constructed as demand dictated, working from north to south along the apron, with flexibility to meet prospective tenants’ needs.

Concepts A and B were combined to produce the preferred development concept depicted in Figure 5 - 14, with the revised alignment of the inbound terminal roadway. This plan retains the multi-tenant cargo and GA development along the airside but eliminates consolidation of the rental car service area to accommodate a cell phone lot. The cell phone lot would be incorporated into another location between the inbound terminal roads, west of the CONRAC and QTA. If the existing cargo building can be retained by changing the proposed alignment of the inbound road as discussed with the Landside Z concept, then the southern portion of this development plan would not be implemented until the cargo building was replaced by a newer, more efficient facility.
Figure 5 - 14: West Service Area Preferred Development Concept

Source: Jacobs Engineering Inc., August 2012
5.3. NORTH AIRFIELD AREA

North airfield development is depicted in Figure 5 - 15. The north airfield encompasses the area south of I-275 and north and west of the terminal area. Land uses in the north airfield include public and employee remote parking, aviation-related development, aviation support (KCAB maintenance shops and storage), and future commercial development.

The concept also recognizes the future Boone County plan for a regional rail connection with a future station just north of the remote public parking (ValuPark) lot. Alignment for an on-airport connector is shown running south into the terminal area. While regional rail planning is only in its infancy, it is important to retain the possible link within the Master Plan for maximum flexibility of access over the next several decades.

**Figure 5 - 15: North Airfield Land Use Concept**

Source: Jacobs Engineering Inc., April 2012
5.3.1. ROADWAYS AND ACCESS

Roadway access is a critical element of north airfield and airport development. Evaluation of current and future traffic patterns and demand identified several issues in the KY 212 and I-274 area that required improvement. Alternatives for addressing these issues were proposed as part of the north airfield development plan.

- **Weaving and left-turn issues, KY 212 from I-275 to Petersburg Road:** The northbound two lanes of KY 212 between the westbound-to-northbound off-ramp and the traffic signal at KY 20 are signed and marked for a single left turn lane and a single right turn lane. The morning peak hour volume is heavily oriented to left turns, as 800 out of 850 vehicles turn left. Many of these are large trucks. The result is a queue at the signal in the left lane, one which extends past the end of the off-ramp. Traffic coming off the ramp has to force its way into the queue, which frequently results in the blockage of the other northbound lane. While much of this traffic is not airport traffic, a portion is related to the off-airport parking lots, affecting airport customers and the shuttle buses serving those lots.

- **Westbound-to-southbound off-ramp from I-275:** This loop ramp was created to enable the heaviest movements into the airport to exit the freeway without having to pass through a signal-controlled intersection. The ramp has a capacity of 1,400 vehicles per hour, and at its current level of usage (650/hour in the AM peak), it works well. The issue related to this ramp is back on the I-275 mainline lanes. During peak times, and under the former heavier airport traffic conditions, the issue described above could back the queue for the other westbound off-ramp onto the right lane of I-275. This would affect the airport traffic which needed to be in the right lane to diverge right onto the loop ramp immediately downstream. While this issue is rare under today’s air service conditions, when airport passenger activity increases, this will likely again become both an operational and safety issue.

KCAB and KYDOT have been planning for a dedicated direct ramp on a flyover from I-275 westbound onto southbound KY 212 (Terminal Drive) to serve traffic going to the airport, lessening congestion at the I-275/KY 212 interchange. The project previously was in final design, but was placed on hold due to the changes at the Airport. Proposed improvements are shown in Figure 5 - 16.
Figure 5 - 16: Proposed Flyover to Airport

Source: KYTC Plans for I-275/KY-212 Interchange and KY 20. Project No:6-8000.11 FD04 1550 C008

Substantial commercial and warehouse development in the area north and west of the Airport has occurred since the flyover plans were developed, creating a shift in traffic patterns. Evaluation of the intersection with future traffic projections identified an alternative set of improvements to resolve congestion, as depicted in Figure 5 - 17. In this alternative, the higher cost of the fly-over is replaced by improvements to the geometry of the loop ramp serving the westbound to southbound movement (the main movement into the airport). The radius of the loop would be increased, and the superelevation modified to ensure safe and efficient traffic flow up to the ramp’s practical capacity. The on-ramp to westbound I-275 would be relocated to the north in order to accommodate the higher radius of the loop ramp, and would be signalized. As with the previous fly-over design, the westbound off-ramps would be segregated and served from a two-lane collector-distributor roadway. The right lane would serve the exiting movement to Petersburg Road, along which off-airport private parking, airport-related hotels, and the warehouse and industrial development are located. The left lane would serve the traffic headed to the airport itself. This eliminates conflicts between traffic headed towards the terminal complex and the traffic bound for the airport’s adjacent development. If constructed as the initial
phase of the work, this connection from westbound I-275 to Petersburg Road could provide access to the terminal during construction of the loop ramp.

This alternative would address the traffic congestion at the junction of the south side ramps which exit from or merge onto the eastbound freeway lanes. The provision of a southbound dual left-turn lane at this signalized intersection, coupled with the channelization of the heavy northbound movement turning right onto the eastbound on ramp for I-275, would provide satisfactory traffic operations through the planning horizon. Due to the proximity of the signal to the bridge over I-275, the span would need to be widened to accommodate the dual left-turn lane bay, but such a cost is considerably less than the previously proposed fly-over structure.

**Figure 5 - 17: An Alternative to the I-275 Flyover**

Both public and employee remote parking lots can be expanded in their current locations to meet forecast demand. Public (ValuPark) lot expansion would be accomplished through expansion to the east and west, with the westward expansion requiring relocation of Loomis Road, as shown in Figure 5 - 15. The current capacity of 6,200 spaces would be exceeded after PAL 1, in 2016 (see Table 4 - 23). Parking could first be expanded to the east, with Loomis Road relocation occurring in subsequent years.
Employee parking demand does not exceed capacity until beyond PAL 5, beyond 2035. Opportunities for expansion beyond that demand level could be to the west, as shown, or to the east and southeast along Donaldson Road.

5.3.3. AVIATION-RELATED DEVELOPMENT

Area for aviation-related development is located between Runways 18R and 18C. Aviation-related development would be considered any type of development that relies on access to the airfield or supports/relies on aviation businesses. Examples would include: air cargo, product distributor offices and warehousing supporting or relying on air cargo operations, aircraft maintenance, repair and overhaul (MRO) and supporting shops, airline facilities, and GA and business aviation facilities. If demand for general aviation increased, the area between Runways 18R and 18C could be considered for a general aviation airpark, with the benefit of segregating light general aviation aircraft from heavier commercial aircraft. This location may be particularly suitable for corporate aviation tenants who generally do not rely on terminal services and do not need that close proximity to the terminal area. General aviation use in this area should be evaluated in future plans if demand increases.

The elevation of the airfield, runways and taxiways is higher than the area to the north; therefore, the tracts north of Taxiway A have limited airfield access. However, the site adjacent to the Runway 18C RPZ is filled to the elevation of the airfield and could support development of a FedEx hub with aircraft access to the airfield. Truck access to the site would be from Loomis Road and would require long driveways ramping up into the facility.

The Elijah Creek floodplain extends into the area between the runways. Previous airfield development included construction of a large detention area between Taxiway A and Petersburg Road. Development in this area would require environmental and flood studies, and re-grading of the land. Additional detention capacity may be required.

A site adjacent to Petersburg Road is identified for potential commercial development, appropriate for industrial or warehousing similar to the private development just to the east. Building heights would be restricted in this area due to proximity to the runways. However, industrial warehouses and aircraft hangars could be accommodated within the height restrictions.

A new roadway would be needed to support development between the runways, as shown by the dashed line bisecting the development area. A connection to/from I-275 eastbound may be beneficial to provide better access and relieve congestion as traffic volumes increase with development. Alternatively, a half interchange with I-275 at Petersburg Road would provide access in both directions, albeit not directly to/from the development. In either case, any connection to I-275 would require an Interchange Justification Report as prescribed by the Federal Highway Administration (FHWA). New interchanges must be approved by the Metropolitan Planning Organization and incorporated into the regional long-range transportation plan (LRP) and the transportation improvement plan (TIP). They also need to be approved by FHWA and by the Kentucky Transportation Cabinet. The on-ramp to I-275 was part of the Kentucky Transportation Cabinet approval in the Interchange Modification Report for the flyover at KY 212, and was given FHWA sign-off as well. Addition of an off-ramp would require re-evaluation.
5.3.4. AVIATION SUPPORT
KCAB operates a maintenance facility in the north airfield, labeled as KCAB Airport Support Campus on Figure 5-15, which has room for expansion. The north Glycol Processing and Receiving Facility (GPRF) is located north of Runway 18C under the RPZ. The associated retention pond and NPDES outfall into Elijah Creek are located between the GPRF and Petersburg Road.

Additionally, the East Service Area shown in Figure 5-14 is home to the fuel farm, bus maintenance facilities, Delta Warehouse, Delta Air Cargo, Delta GSE storage/maintenance and the Gate Gourmet Building. As noted in Chapter 4, these facilities will not require expansion during the planning period and could be remodeled to accommodate other functions. As facilities age and/or if there is a sudden change in the operating environment, the airport needs to have the flexibility to provide a replacement facility. Therefore, it is recommended that space around the facilities be reserved for replacements and/or expansion. This includes:

- Approximately two (2) acres of open space northwest of the existing fuel farm for future fuel farm replacement/expansion
- Approximately four (4) acres of open space in the northwestern-most part of the east service area for additional bus maintenance/storage facilities
- The open space surrounding both the Delta Air Cargo Building and the Gate Gourmet Building needs to be reserved for either use in order to allow for expansion/or replacement of either facility.

5.3.5. FUTURE COMMERCIAL DEVELOPMENT
KCAB has recognized the benefits of increasing non-aviation revenues and therefore commissioned a market study on potential commercial development of property not needed for aviation or aviation support. The highest and best use of the area east and west of KY 212, between Donaldson Road and I-275, was a commercial airpark development or airport technology campus. The study noted that development of a technology campus reflects global and national trends, and also provides local opportunities for job growth and new business recruitment. The types of businesses might include:

- Technical and scientific services: management, scientific, technical consulting services; architectural and engineering related services; other professional scientific and technical services; scientific research and specialized design services
- High-Tech manufacturing of electronics, including electronics, computers and peripherals, audio and video equipment, magnetic and optical equipment, semiconductors, communications equipment, electric power generation transmission and generation equipment and electrical lighting
- Advanced telecommunications
- Traditional telecommunications
- Complementary wholesale: machinery, equipment, and supplies, hardware, plumbing heating equipment, electrical, and electronic goods
- General wholesale, including grocery and related products; miscellaneous durable and non-durable goods; vending machine operations; petroleum products; direct selling
establishments; beer, wine and alcoholic beverages wholesale; electronic shopping and mail order; and apparel, piece goods and notions merchants

- Trucking and warehouse, including general freight trucking, warehousing and storage, transportation services, messenger and delivery services, and other support activity for transportation services. Note: These types of high-traffic developments should be sited in locations with direct access to highways and where there is no interference with airport traffic.

The best parcels with highway visibility should be reserved for the most techno-savvy tenants with secondary locations serving warehouse, distribution and trucking facilities that support or are complementary to the technology campus.

The area east of KY 212 was anticipated to be more marketable than the western area, which currently is developed as remote public parking (ValuPark). Therefore, the North Airfield development concept identifies areas outside of the existing employee parking lot for potential commercial development of an Airpark/Technology Campus, with access from Donaldson Road. As the initial parcels are developed, KCAB can evaluate the benefit of relocating employee parking to allow further commercial development in the area.

Developable area is approximately 66 acres to the west of the employee lot and 45 acres to the east. A portion of the area to the east of the employee lot is within the Runway 18L/36R RPZ. Those areas within the RPZ will be subject to land use restrictions in accordance with FAA Advisory Circular 150/5300-13A and current FAA guidance on Land Uses within a Runway Protection Zone. The FAA Office of Airports must evaluate and approve any land use not specifically allowed by the Advisory Circular. No development in this area shall negatively impact aviation. Heights of all buildings and structures must remain below the 62.5 to 1 surface used by operators for one engine inoperative performance and planning. Roadway access onto Donaldson Road would need to be coordinated with the Kentucky Transportation Cabinet.

5.4. SOUTH AIRFIELD AREA

The south airfield is anchored by DHL and the GA area, as depicted in Figure 5 - 18. This section discusses potential uses for this area.

5.4.1. ROADWAYS AND ACCESS

Aero Parkway (formerly identified as South Airfield Bypass Road), a four-lane divided roadway, was completed in October 2012. This roadway dramatically improves access to the South Airfield, creating a link between Burlington Pike and Turfway Road, with a connector (Ted Bushelman Boulevard) to Houston Road in Florence to reduce congestion on existing roads south of the Airport. A two-lane extension of Wendell Ford Boulevard is proposed to bisect the south airfield area from north to south, bounding DHL on the west. Wendell Ford will connect to Aero Parkway in an unsignalized four-way intersection with a connector to Zig Zag Road. This alignment differs from that shown in the 2025 Airport Master Plan, but coordinates with the predetermined intersections for Aero Parkway. Aero Parkway is a limited access roadway for which driveway access will be restricted. Therefore, access to tracts fronting on Aero Parkway without access to another public road should be provided by a spur from Wendell Ford Boulevard.
Figure 5 - 18: South Airfield Development Concept

Source: Jacobs Engineering Inc., April 2012
Although KCAB had developed preliminary plans to depress Wendell Ford along the south side of DHL’s lease to allow a south bypass taxiway, DHL’s expansion to the south eliminated the taxiway and the need to depress the roadway. DHL has indicated that it prefers a contiguous expansion, which the proposed alignment and extension of Wendell Ford Boulevard would provide. DHL currently employs about 2,000 workers in three shifts. The third shift, from 1:00 a.m. to 6:00 a.m., is the largest at 1,400 employees; the remaining 600 employees are split between the first and second shifts. Peak hour traffic into and out of the facility occurs prior to 1:00 a.m. and after 6:00 a.m., primarily via South Airfield Drive. With the recent expansion, DHL plans to increase employees by about 14 percent. Tractor trailer traffic will also increase. Despite this growth, Wendell Ford Boulevard will operate with adequate level of service through the planning horizon as a two-lane road, as its highest volumes do not occur when the Aero Parkway is busiest. Collateral development of airfield-related development in the south airfield could impact traffic patterns and demand on Wendell Ford Boulevard. KCAB should conduct a traffic signal warrant study as part of the final design of the extension of Wendell Ford Boulevard, in order to ascertain whether traffic exiting the airport (especially left turns) under STOP control will be provided with an acceptable level of service. If not, a signal may well be warranted.

Additionally, KCAB developed South Airfield Road and Wendell Ford Boulevard with right-of-way to be expanded to four lanes when needed. This right-of-way should be maintained. The next master plan should evaluate traffic patterns to determine if future widening of either roadway is necessary.

5.4.2. GENERAL AVIATION
The existing GA facilities at CVG are located in the South Airfield. The FBO is bordered to the west by the south ARFF station and to the east by the Airport Surveillance Radar (ASR-9). Forecasted GA demand would not require expansion of the FBO facilities. Should the general aviation environment change and/or a second FBO operator express interest in operating at CVG, future expansion of the FBO facilities and/or a second FBO facility on a greenfield site would need to occur to the east of the existing facility; however, the existing location of the ASR-9 limits potential expansion to the east. Alternative locations and uses of the ASR-9 site and other GA facilities are discussed in this section.

5.4.2.1. Airport Surveillance Radar
The existing ASR-9 and its associated 1,000-foot critical area limit potential expansion opportunities in the South Airfield. It is recommended that the existing ASR-9 be relocated to the western portion of the airfield northwest of Runway 9-27 and west of Runway 18R-36L when the FAA programs the replacement facility.

The relocation, while not currently required, would allow KCAB improved flexibility in the South Airfield. The available land area could be used for future GA expansion. Potential land uses for the area should be re-evaluated when the ASR-9 is relocated.

5.4.2.2. Old Comair Facilities
The former Comair Facilities in the South Airfield include the 183,936-square-foot Class A corporate office space, the 18,684-square-foot corporate hangar with adjacent offices. All facilities are currently vacant. The corporate office is a Class A six-story office space built in 2000. This is a significant asset that is likely capable of attracting corporate headquarters from aviation-related companies as a result of its condition, size, and location. It is recommended that
should the KCAB staff be interested in attracting national and international firms to the available facilities, a study be conducted that outlines the socioeconomic benefits of the facility, its location and the surrounding communities that could be used as a marketing vehicle for the available space.

Other possible alternative uses for the facilities include office space for KCAB staff and multi-tenant leasing opportunities.

In addition, the corporate hangar space is suitable for future FBO or aircraft maintenance, repair and overhaul (MRO) companies. To maintain flexibility, KCAB should reserve space around the existing corporate hangar should an interested party require a larger hangar area, as shown in Figure 5-17.

5.4.3. AVIATION SUPPORT

5.4.3.1. Air Traffic Control Tower (ATCT)

The FAA ATCT and Terminal Radar Approach Control (TRACON) facility are located in the South Airfield. The ATCT was constructed in 1997 and is sufficient for the planning period. However, as shown in Figure 5-18: South Airfield Development Concept, space should be reserved around the existing tower to allow an in-place replacement should a newer/taller ATCT be required due to aging infrastructure, changing technologies or future airfield expansion beyond the planning period.

The TRACON building is located adjacent to and east of the ATCT. While not required in the foreseeable future, space should be reserved adjacent to the existing TRACON facility for an in-place replacement beyond the planning period, as shown in Figure 5-18.

5.4.3.2. KCAB Maintenance

The Airfield Maintenance Facility, Sand Storage, and Airfield Equipment Storage buildings are located in the South Airfield. As discussed in Chapter 4, these facilities are currently adequate for the planning period. Land in the vicinity of the existing buildings should be reserved for building replacement and/or expansion, should the age and/or operating environment require replacement facilities beyond the planning period.

5.4.3.3. Contractor Staging Area/Bone Yard

The existing contractor staging area in the East Service Area is in a high value location, but will be useful for upcoming terminal area development until a higher and better use is found for the site. Due to the significant amount of development proposed in the South Airfield Area during the planning period, a second Contractor Staging Area/Bone Yard could be relocated to an area north of South Airfield Road and east of Building 63. This location, although somewhat limited by ASR-9 clearances, allows contractors to have easy access to the airfield, Central Terminal Area and South Airfield Area.

5.4.4. DHL

DHL anticipates future expansion to the north and south. Expansion to the west is limited by Wendell Ford Boulevard, which provides vehicular access to the site. Although the roadway could be depressed, to provide taxi-lane crossings from east to west, DHL prefers not to have those types of operational and physical restrictions if avoidable.
Southern expansion could extend as far south as the northern right-of-way of Aero Parkway. Northern expansion is limited by the location of South Airfield Road and, to a lesser extent, the ASR-9 critical area which dips south of South Airfield Road. The road’s existing grade is significantly lower than the northern boundary of the future DHL expansion to the north, due to the underpass at Runway 18L-36R. South Airfield Drive could not easily be lowered for the full length needed to allow expansion further north than its southern right-of-way. Expansion into the north and south parcels that are available could approximately double DHL’s existing area.

In addition, the extension of Taxiway “S” to the edge of the Runway 36R RPZ would provide a suitable apron edge taxiway to serve a DHL expansion to the south.

As discussed in Chapter 4, DHL began construction to expand its existing aircraft parking apron in March 2011 and completed the work by the end of 2012. The DHL facilities in place at the end of 2012 include:

- **Main Sort Building** – 339,355-square-feet
- **Truck/Administration Building** – 129,232 ft-square-feet
- **GSE/Line Maintenance Building** – 59,400 ft-square-feet
- **Large Non-Conveyable Freight Sort Building** – 179,231 SF
- **Pilot’s Quarters** – 17,000 SF
- **Aircraft Parking Apron** – 522,618 square yards of concrete apron, capable of accommodating up to 69 aircraft, including hydrant fueling and de-icing pads
- **GSE & Tug Parking** – 63,137 square yards
- **Automobile parking lots** with approximately 1,650 spaces on pavement and an additional unpaved area for 150 vehicles.

### 5.4.5. AVIATION-RELATED DEVELOPMENT

Aero Parkway, a four-lane divided roadway, is scheduled for completion in October 2012. This new road improves the access to the South Airfield. Improved access provides an opportunity for aviation-related development in this area without the conflicts with air carrier traffic on the north end of the Airport. Similar to the north end, the South Airfield is positioned between two runways (Runway 18C/36C and Runway 18L/36R), providing great airfield access. It will be bisected by the extension of Wendell Ford Boulevard to the south. Improved taxiway access to this area may be required as build-out of the area occurs, which is not expected during the planning period. However, space should be reserved for dual Group V taxiways to serve development on west side of the South Airfield, as shown in Figure 5-17. Due to the close proximity to DHL, the types of aviation-related development anticipated in this area are primarily air cargo and distribution, but could also include MRO facilities, and aircraft manufacturing facilities.

### 5.4.6. FUTURE COMMERCIAL DEVELOPMENT

Aero Parkway improves access to the South Airfield by creating a link between Burlington Pike and Turfway Road; a connector to Houston Road in Florence reduces congestion on existing roads south of the Airport. It also offers an opportunity for commercial development in the surrounding KCAB property for uses such as: technical and scientific services, high-tech manufacturing, advanced and traditional telecommunications, complementary wholesale, general wholesale and trucking and warehouse, all as previously described in Section 5.3.5.
Several areas have been identified as “Aviation Reserve.” These are areas lie in the extended RPZ and are subject to height restrictions because of topography.

5.4.6.1. Southwest Development Area

Currently, vehicle access to the Southwest Development Area is limited. However, Aero Parkway is expected to bring improved access to several areas of the Airport. The Southwest Development Area, while not currently developed and/or needed for expansion at this time, will likely become more valuable once the new roadway is complete. The 2025 Airport Master Plan identified this area to be used as a “Foreign Trade Zone” (FTZ). The implementation of an FTZ in this location should be carefully analyzed when demand and/or opportunity warrants consideration. Aero Parkway presents opportunities for warehousing and distribution firms to be in this area and easily integrated and associated with an FTZ.

The 2025 Airport Master Plan identified a portion of this area as a potential site for a future east/west runway. Although airfield demand is adequately served by the existing airfield beyond PAL 5, this potential runway site will be retained to protect land use compatibility.

5.4.6.2. East Collateral Development Area

The 2025 Airport Master Plan identified portions of the area east of Runway 18L/36R as a Collateral Development Area. This area was identified as an ideal location for freight forwarding facilities because of its proximity to I-75 and I-275. This is still an acceptable land use for this area as the Boone County 2030 Future Land Use Map indicates that the planned surrounding land uses for this area are primarily industrial and business park uses.

The OKI Transportation Plan indicates that major widening of both Donaldson Road and Mineola Pike are planned prior to 2030 in this area. This would improve access to the east side of the Airport and reduce peak hour congestion.

The 2025 Airport Master Plan identified a portion of this area as a potential site for a future north/south runway. Although airfield demand is adequately served by the existing airfield beyond PAL 5, this potential runway site will be retained to protect land use compatibility.

5.5. OTHER AREAS

5.5.1. WEST AIRFIELD

The west airfield includes numerous parcels acquired for noise mitigation around the western end of Runway 9-27 which are designated for aviation-related development. These uses are appropriate and will continue to be shown in the updated land use plan.

A location is shown for the future relocation of the ASR-9 radar which is currently located south of Taxiway M and west of Taxiway S. Timing of relocation would be a function of the FAA’s need to replace the equipment, which is, as yet, undetermined. Adequate space should be reserved in the location shown north of the west end of Runway 9-27 for this future relocation.

5.5.2. EAST AIRFIELD

The East Airfield, east of Runway 18L-36R, also includes the airfield viewing area and several developed and undeveloped tracts of Airport Property. Developed properties include a warehouse and telephone exchange. Tracts acquired for noise abatement should be maintained as compatible development to comply with FAA requirements.
5.6. AIRFIELD INFRASTRUCTURE

5.6.1. RUNWAYS
Additional runway capacity will not be required at CVG during the planning period. Due to the downturn in traffic and projected activity levels in the approved aviation forecast, capacity related airfield improvements (other than Group VI improvements) are not justified within the 20-year planning horizon. However, as noted in previous sections, both of the potential sites for future runways to serve demand beyond the planning period will be retained to protect land use compatibility.

5.6.2. DE-ICE FACILITIES/OPERATIONS
Additional de-icing capacity was identified as a requirement for future demand and operational efficiency once the preferred concourse redevelopment alternative is implemented. When considering new or expanded de-ice pads the following siting criteria should be considered:

- De-ice pads should be in close proximity to runway ends
- De-ice pads should be a short drive from a glycol refill station
- Pad locations should avoid the need for an on-airfield escort and be located away from existing and future concourse buildings as well as general apron circulation areas

Through coordination with airlines currently operating at the Airport, Pad 7, northeast of the concourses, was identified as the preferred location for expansion of de-icing positions. This location is consistent with siting criteria and has been recommended by airlines currently operating at the Airport. The Phase 1 expansion (2025) would allow for two (2) aircraft to be de-iced simultaneously on the pad, while a later (2035) expansion would allow for four (4) aircraft to be de-iced simultaneously. However, in order to provide four aircraft de-icing positions, the existing Pad 7 orientation would require adjustment from an east-west orientation to a north-south orientation. This would allow for two Group III taxiways on each side of the future Pad 7 and flow of aircraft from west to east without blocking access to the Delta maintenance hangar apron. See Figure 5 - 19.

Due to the age of the pavement, the apron in this area is expected to be rehabilitated or reconstructed in this timeframe. As part of that apron rehabilitation project, de-ice pad 7 would be reconstructed and reoriented to a North-South configuration. The proposed reorientation of de-ice pad 7 should be considered in a follow-on comprehensive De-ice Study for CVG considering the current operating conditions – OALs in Concourse A – and the preferred development alternative for the 2035 concourse configuration. The focused De-ice Study would provide the airport with a comprehensive approach to evaluating the best location to conduct future de-icing operations and determine the optimum location and timing for future investment.

Additional de-ice pad locations are discussed in relation to their location on the airfield under Other Airfield Improvements later in this chapter. New development in currently undeveloped areas of the airfield could create the need for these additional de-ice pads. Therefore, these de-ice pad locations are presented to provide KCAB staff guidance in longer term planning.
Figure 5 - 19: De-Ice Pad 7 Expansion

Source: Jacobs Engineering Inc., September 2012
5.6.3. OTHER AIRFIELD IMPROVEMENTS

Airfield improvements will focus on the following:

- Improvements to accommodate Group VI aircraft
- Airfield Operational Improvements
- Projects beyond the 20-year planning horizon as a reservation of space and to meet unforeseen demand if activity grows at a faster rate than projected

5.6.3.1. Improvements to Accommodate Group VI Aircraft

DHL is expected introduce B747-800 aircraft into their cargo fleet in the near term. KCAB has been working with The Boeing Company to define operational conditions that would allow use of the existing airfield. However, permanent modifications may need to be constructed to accommodate regular Group VI operations (ADG D-VI and TDG-6). These could include:

- Widening Runway 9-27 to 200 feet and constructing 40-foot shoulders
- Reconstructing Taxiway M for its full length and constructing 35-foot shoulders, in addition to completing the extension to the west for the full length of Runway 9-27 at 75 feet wide with 35-foot shoulders. Runway-to-taxiway separation would remain at a minimum of 400 feet for the existing sections of Taxiway M (appropriate for the CAT I approach on Runway 9-27), but the extension would be separated from the runway by 500 feet.
- Reconstruction of connecting taxiway fillets along the runway and taxiway
- New lighting, signage and markings

A future Group VI feasibility and design study will be needed to determine specific requirements and define the scope of the project.

5.6.3.2. Airfield Operational Improvements

DHL’s current expansion to the south and its expansion to the north in the foreseeable future will place increased demand on the southeastern portion of the airfield during DHL’s peak hour of operations. DHL’s current aircraft arrival and departure operations are primarily conducted to Runway 27. This requires arriving aircraft to taxi via Taxiways “N”, “S” and “T” to access the existing DHL apron area. However, because of pavement strength restrictions and lack of taxiway shoulders, arriving aircraft that are Group IV or larger, are restricted from accessing Taxiways “S” and “T” via a 1,600-foot portion of Taxiway “M” directly north of the old Comair Aviation Hangar. This limits arriving DHL aircraft to a route of Taxiways “D” and “N” or routes north of Runway 9/27 to reach the DHL apron area.

While this operational restriction has yet to cause peak hour delays for DHL operations, as the South Airfield grows, these restrictions may become more critical. In addition, KCAB staff has identified this operational constraint as a long-term concern when considering airfield capacity in the South Airfield. There are several alternatives to alleviate the potential airfield restriction—the two most reasonable and feasible are discussed in this section.
A. Extend Taxiway “E” to Taxiway “N”

An extension of Taxiway “E” to Taxiway “N” would allow for Group III or larger aircraft to avoid the GA areas adjacent to Taxiway “M”. Additionally, should the South Airfield expand further to the south (see Figure 5-17) an extension of Taxiway “E” would provide increased capacity to a future aviation-related expansion area, while allowing aircraft accessing the future expansion to the south to avoid the DHL area altogether.

The extension of Taxiway “E” would be offset from its existing alignment to the east to allow a Group V (267-foot) separation between Taxiway “D” and Taxiway “E”. This alignment would allow Group V aircraft to operate on the Taxiway “E” extension between the South Airfield and Runway 9/27.

B. Recommendations – Other Airfield Improvements

While the rehabilitation and strengthening of Taxiway “M” allows minimal investment into the airfield, it would likely only provide a short-term operational solution. For the long-term viability of the South Airfield and DHL operations, it is recommended that the extension of Taxiway “E” to Taxiway “N” be implemented when DHL and GA demand in the South Airfield warrant increased taxiway capacity and operational efficiency.

In addition, to provide greater operational efficiency for cargo aircraft movement into and out of DHL’s main cargo apron, Taxiway “N” needs to be extended to the east to Taxiway “T”. An extension of Taxiway “S” to the south to provide suitable airfield access for a DHL southern expansion is also recommended in conjunction with DHL’s future southward expansion. Taxiway “T” cannot be extended to the south due to the location of the Runway 36R RPZ.

Additional analysis of these physical airfield improvements would be required at a later date to determine their specific benefit and timing with respect to improving operational efficiency in the South Airfield as DHL continues to increase their operational presence at the Airport.

5.6.3.3. Ultimate (Beyond 2035) Airfield Improvements

The CVG 2025 Airport Master Plan recommended several airfield physical improvements that would increase operational efficiency, reduce delays, and increase airfield capacity. The operating environment has changed significantly since the previous master plan. The airfield does not currently experience a deficiency in capacity and that condition is not expected to change during the planning period. However, several improvements to the airfield are carried forward in this plan as a result of a planned reconfiguration of the terminal area and a shift in airfield demand from the air carrier area to the South Airfield as a result of a reduction in air carrier demand and forecasted increase in DHL cargo demand. Since projects not shown on the approved ALP are not eligible for FAA funding, it is prudent to include projects that would be required to meet aviation activity beyond the 20-year horizon on the future ALP as “ultimate” improvements. By doing so, KCAB can take a strategic position to meet unforeseen demand if elements of aviation activity increase sooner than anticipated.

All of these elements would be re-evaluated in the next master plan update, but are shown for illustrative purposes on Figure 5-20. These elements include:
Figure 5-20: Future Airfield Development

Source: Jacobs Engineering Inc., September 2012
• Extend Taxiway “K” to “S”
  - Because of a shift in airfield demand to the South Airfield, this taxiway extension would allow peak period departing aircraft taxiing from the South Airfield to more efficiently reach the north side of Runway 27 and improve departure queuing.

• Extend Taxiway “C” to the Runway 36C End
  - Departures off of the Runway 36C end currently occur when CVG is in a north only flow, which typically occurs only 5 percent of the time. During these conditions, the departures are split between Runway 36C and Runway 36R. Because of the infrequent use and of Runway 36C as a departure runway and the sufficient airfield capacity available throughout the planning period, the extension of Taxiway “C” will not be required in the foreseeable future. However, the extension needs to remain on the future Airport Layout Plan to prevent ancillary development in its proposed location.

• Additional De-ice Areas
  - Forecasted aviation demand indicates that additional de-ice pads will not be required during the planning period. However, a complete build-out of the area between Runway 18R and Runway 18C would significantly increase the traffic into and out of that portion of the airport. In addition, the remote nature of this portion of the Airport would dictate development of individual or centralized de-ice facilities to support future development in the midfield area. Therefore, it is recommended that the de-ice areas for this portion of the Airport, shown on the future Airport Layout Plan to provide KCAB staff maximum flexibility when potential tenants are considering development between Runways 18C and 18R.

• High-Speed Exit Runway 36R
  - As the preferred development plan for the air carrier terminal area discussed earlier in this chapter is implemented, the alignment of the taxilanes/taxiways into and out of the air carrier apron will be adjusted. For example, the existing Ramp 2 North taxilane and aircraft traffic flows in this area will be adjusted slightly southward. The addition of a high speed taxiway approximately 6,000 feet from the Runway 36R runway end would allow aircraft accessing the southern portion of the air carrier terminal area a more direct taxi route, would allow a quicker runway exits from 36R, and would improve airfield capacity beyond the planning period. However, a high-speed exit location study would need to be conducted prior to implementation of the high-speed exit that incorporated CVG’s fleet mix at the time of construction.

These operational improvements should remain on the future Airport Layout Plan to give KCAB staff flexibility to meet demand. However, significant build-out of the South Airfield will likely have to occur prior to most of the above-mentioned items being implemented. This would include a complete build-out of the DHL area, a major MRO or FBO operator occupying the former Comair corporate hangar, and a significant increase in GA activity. Individual projects should be assessed for return on investment based on current and forecast demand before implementation.