



Chapter 5 – Airport Development Alternatives

The evaluation of future development options represents a critical step in the airport master planning process. The primary goal is to define a path for future development that provides an efficient use of resources and is capable of accommodating the forecast demand and facility needs defined in the master plan.



Introduction

As noted in the facility requirements evaluation, current and long-term planning for Lexington Airport is based on maintaining and improving the airport's ability to serve a wide range of general aviation and business aviation aircraft.

All proposed facility improvements are consistent with applicable FAA airport design standards and FAR Part 77 airspace planning standards. Airplane Design Group II (ADG II) standards are recommended for all primary facilities including the runway, parallel taxiway, access taxiways, and major taxilanes. All proposed improvements are compatible with the airport's existing nonprecision instrument approach capabilities.

Evaluation Process

Creating preliminary alternatives represents the first step in a multi-step process that leads to the selection of a preferred alternative. An important part of the master plan update process is the evaluation of previous master plan recommendations and actual facility development that subsequently occurred. Major improvements completed in the last ten years include runway reconstruction, new lighting, taxiway construction and rehabilitation, apron and taxilane reconfiguration, and hangar construction.



Improvements that have not been completed are reevaluated to determine to if they remain relevant to current needs.

The preliminary alternatives are prepared and evaluated to identify general preferences for both individual items and the overall concepts being presented. The process allows the widest range of ideas to be considered and the most effective facility development concept to be defined. From this evaluation process, elements of a preferred alternative will emerge that best accommodate all required facility improvements. The Consultant will integrate these items into a draft preferred alternative that will be reviewed and refined as the County proceeds through the process of selecting a final preferred development alternative for Lexington Airport. Throughout this process, public input and coordination with the FAA will also help to shape the preferred alternative.

Once the preferred alternative is selected by the County, a detailed capital improvement program will be created that identifies and prioritizes specific projects that can be implemented. The elements of the preferred alternative are integrated into the updated airport layout plan (ALP) drawings that will be used to guide future improvements at the airport.

Final Report Note: A preferred alternative was developed through the evaluation process described above. A description of the preferred alternative begins on page 12 of this chapter. The original sequence and descriptions of the preliminary alternatives presented in the draft working paper are maintained without revision to illustrate the process used.

No-Action Alternative

In addition to proactive options that are designed to respond to future facility needs, a “no-action” option also exists, in which the County may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The existing airfield configuration would remain unchanged from its present configuration and the airport would essentially be operated in a “maintenance-only” mode.

The no-action alternative concept establishes a baseline from which the action alternatives can be compared. The purpose and need for the action alternatives is defined by the findings of the forecasts and facilities requirements analyses. Forecast aviation activity and the factors associated with increased activity (potential for congestion, safety, etc.) are the underlying rationale for making facility improvements. Market factors (demand) effectively determine the level and pace of private investment (hangar construction, business relocation to the airport, etc.) at an airport. Public investment in facilities is driven by safety, capacity and the need to operate an airport on a financially sustainable basis.



Based on the factors noted above, the no-action alternative is inconsistent with the management and development policies of Morrow County and its long-established commitment to provide a safe and efficient public air transportation facility that is socially, environmentally, and economically sustainable.

Preliminary Development Alternatives

The primary facility needs identified in the facility requirements analysis include taxiway and apron taxilane improvements, aircraft parking, and aircraft hangars. Items such as fencing, lighting improvements, minor roadway extensions, and pavement maintenance do not typically require an alternatives analysis and will be incorporated into the preferred development alternative where appropriate. The preliminary alternatives have been organized into two groups to address these broad needs and other related needs:

- *Airside Development Options (Runway/Taxiway)*
- *Landside Development Options (Aircraft Storage and Support)*

Airside facilities include runway and major taxiways, signage, and lighting. Landside facilities include aircraft storage (parking or hangar space), fueling, vehicle parking, and other support facilities. The preliminary development alternatives are described below with graphic depictions (**Figures 5-1 through 5-3**) provided to illustrate the key elements of each alternative. The preliminary alternatives are intended to facilitate a discussion and evaluation about the best path to meet the facility needs of the airport.

It is important to note that the eventual preferred alternative selected by the County may come from one of the preliminary alternatives, a combination or hybrid of the preliminary alternatives, or a new concept that evolves through the evaluation and discussion of the preliminary alternatives. Once the elements of the preferred alternative are defined, they will be integrated into the updated Airport Layout Plan (ALP) as “future” development and the individual projects will be included in the updated capital improvement program.

Airside Development Options

As noted in the Facility Requirements analysis, the current runway length of 4,156 feet was identified in the FAA’s runway length model as being capable of accommodating more than 99 percent of the small general aviation airplane fleet and is also adequate to accommodate the design aircraft. Based on current capabilities, no extensions are recommended for Runway 8/26 at this time. Runway extension reserves may be considered by Morrow County if there is interest in preserving long-term development options.

The main component in the airside development options is improved taxiway access for Runway 8/26. The existing south parallel taxiway access extends approximately 2,410 feet from the east end of the runway and has two exit taxiway connections. The west end of the runway is approximately 1,745 from



the end of the south parallel taxiway. Aircraft are required to back-taxi on the runway to reach the end of Runway 8 for takeoff or after landing on Runway 26, when they are unable to use the mid-runway exit.

The 2001 ALP Report recommended a north parallel taxiway extension, primarily based on the amount of fill required to extend the south parallel taxiway to the west end of the runway. The previous planning was conducted prior to the runway and south parallel taxiway projects, which produced new topographic survey data. An updated analysis of construction costs for both north and south taxiway options has been developed using the detailed topography to allow an accurate comparison (see **Table 5-1**).

AIRSIDE OPTION A

Airside Option A (see **Figure 5-1**) includes a 1,740-foot parallel taxiway extension and a 185-foot exit taxiway on the north side of Runway 8/26. This taxiway configuration was recommended in the previous airport master planning and is depicted on the 2001 Airport Layout Plan. The new taxiway would connect to the existing west exit taxiway, requiring aircraft to cross the runway when moving between the north and south sections of parallel taxiway.

Approximately 1.4 acres of property acquisition is required to accommodate the new parallel taxiway and aircraft hold area. The ADG II standard runway-parallel taxiway separation of 240 feet and a taxiway width of 35 feet are used.

AIRSIDE OPTION B

Airside Option B (see **Figure 5-1**) extends the existing south parallel taxiway by 1,700 feet and provides an aircraft hold area adjacent to Runway 8. A benefit provided by Option B is the ability to keep all taxiing aircraft on the developed side of the runway, which eliminates the need to cross the active runway while taxiing. The option was considered in the last master plan, but was not selected due to concerns about the extensive fill required along the steeply sloping hillside. Approximately 2.3 acres of property acquisition is required to accommodate the new parallel taxiway and aircraft hold area (embankment footprint, etc.).

Option B also includes a 90-degree exit taxiway on the south parallel taxiway 1,250 feet from the end of Runway 26 and 2,860 feet from the end of Runway 8. The exit taxiway connects to the parallel taxiway near the western access taxiway. The taxiway location and connection with existing taxiway geometry reflects the FAA's design guidance which does not allow direct, unbroken travel routes between aircraft aprons and runways. The exit taxiway would be available for aircraft capable of short landings (aerial applicator) on Runway 26 and for larger aircraft landing on Runway 8 that are unable to use the western exit taxiway. In both cases, the taxiway would reduce taxi distances between the runway and landside facilities. Although presented as part of Airside Option B, the exit taxiway is compatible with both airside options and could also be developed as a stand-alone project.



Table 5-1 summarizes the development costs for the parallel taxiway components for Airside Options A and B. The project costs include engineering, environmental, contingency, and property acquisition. An additional work element has been included in both options to address new FAA standards for runway object free area grading on the eastern half of the runway.

TABLE 5-1: DEVELOPMENT COST SUMMARY - AIRSIDE OPTIONS A & B

DEVELOPMENT OPTION	EMBANKMENT/EXCAVATION TOTALS	PROJECT COST
Airside Option A (North Parallel Taxiway)	41,800 CY Embankment in Place 42,600 CY Unclassified Excavation (TWY)	\$2,684,211
Airside Option B (South Parallel Taxiway; not including the additional exit taxiway)	81,600 CY Embankment in Place 24,800 CY Unclassified Excavation (TWY)	\$2,857,477
Additive Alternative 1 Eastern Half of Runway Grading	14,400 CY Unclassified Excavation (Runway Grading)	\$176.050*

* Included in Airside Option A and B total costs



AIRSIDE OPTION A



AIRSIDE OPTION B





Landside Development Options

As noted in the facility requirements analysis, several needs were identified including items related to the existing main apron area in addition to new demand driven needs for aircraft hangars, parking, etc. The landside facility requirements defined in Chapter 4 include:

- Main Apron Taxilane Clearances (non-standard clearances to parked aircraft, fueling, etc.);
- Small Aircraft Parking (configuration and capacity);
- Multi Engine Aircraft Parking (configuration and capacity);
- Aircraft Fueling Area (clearance from apron taxilanes, expansion);
- Vehicle Parking;
- Hangars (aircraft storage and commercial/mixed use); and
- A new (replacement) airport rotating beacon is located near the southeast corner of the main apron in both options.

LANDSIDE OPTION A

Landside Option A (see **Figure 5-2**) reflects a modified version of the landside improvements depicted on the 2001 Airport Layout Plan (ALP). The configuration has been modified to reflect current conditions and other facility improvements made since the last ALP was completed. The alignment of the main apron taxilane traveling along the north edge of the apron is not modified. New development is located on the north side of the taxilane and the existing apron is reconfigured.

Option A includes a new small airplane tiedown area north of the existing apron, located between the east and center access taxiways. The tiedown apron has an access taxilane that extends from the north end of the existing apron to the east access taxiway. The taxilane provides access to eight tiedowns, with an additional tiedown development reserve between the apron and parallel taxiway. The apron development may be phased based on demand levels. Initially, four east-facing tiedowns and the access taxilane could be provided, followed by four additional tiedowns located on the north side of the apron. The new apron taxilane would also provide access to the reconfigured aircraft fueling area. In this option, the existing aviation fuel tank is maintained in its current location, although the fueling positions are relocated to the north side of the tank (2 positions). The existing aircraft fueling apron is located partially within the object free area for the east access taxiway/taxilane, which limits the useable area (clear of the adjacent OFA).

Within the main apron, the area that currently accommodates the small airplane tiedowns is reconfigured to accommodate one large aircraft parking position. The parking position is shifted to the west, requiring additional apron pavement immediately west of the existing tiedown area. The angle of the main apron taxilane object free area (TOFA) limits the useable amount of parking area on the south side of the taxilane. The parking position would accommodate transient aircraft including business or medevac fixed wing aircraft and helicopters.



The multi-unit hangar configuration depicted in Option A is based on the 2001 ALP, although the sites could also accommodate an equivalent number of smaller individual hangars. A 2-unit hangar is located near the southwest corner of the main apron that would accommodate small airplanes with access provided by the ADG I taxilane that serves the south side of the existing multi-unit hangar. A 3-unit hangar is located northwest of the agricultural apron adjacent to the west access taxiway.

A large agricultural lease area is located on the west side of the western access taxiway, which is depicted on the 2001 ALP.

LANDSIDE OPTION B

Landside Option B (see **Figure 5-3**) reconfigures the main apron by realigning the outer access taxilane to run parallel to the existing development on the apron. The realigned taxilane allows the main apron to accommodate two large aircraft parking positions along the south edge of the adjacent taxilane object free area, with new development on the north side of the taxilane.

Option B includes a new small airplane tiedown area and fuel area north of the existing apron, located between the east and center access taxiways. The new apron has taxilane connections to the main apron taxilane and the adjacent east and center access taxiways.

The apron has a double row of small airplane tiedowns with 6 north-south facing positions. The new development is located beyond the ADG II OFA for the realigned apron taxilane; the taxilanes in the new tiedown and fueling apron areas are designed to accommodate ADG I aircraft. A tiedown development reserve is located between the apron and parallel taxiway.

The existing aviation fuel tank is relocated to a new fueling apron that is adjacent to the east access taxiway. The new fueling apron provide two positions on the north/west sides of the fuel tank with access provided from the east access taxiway and the main apron.

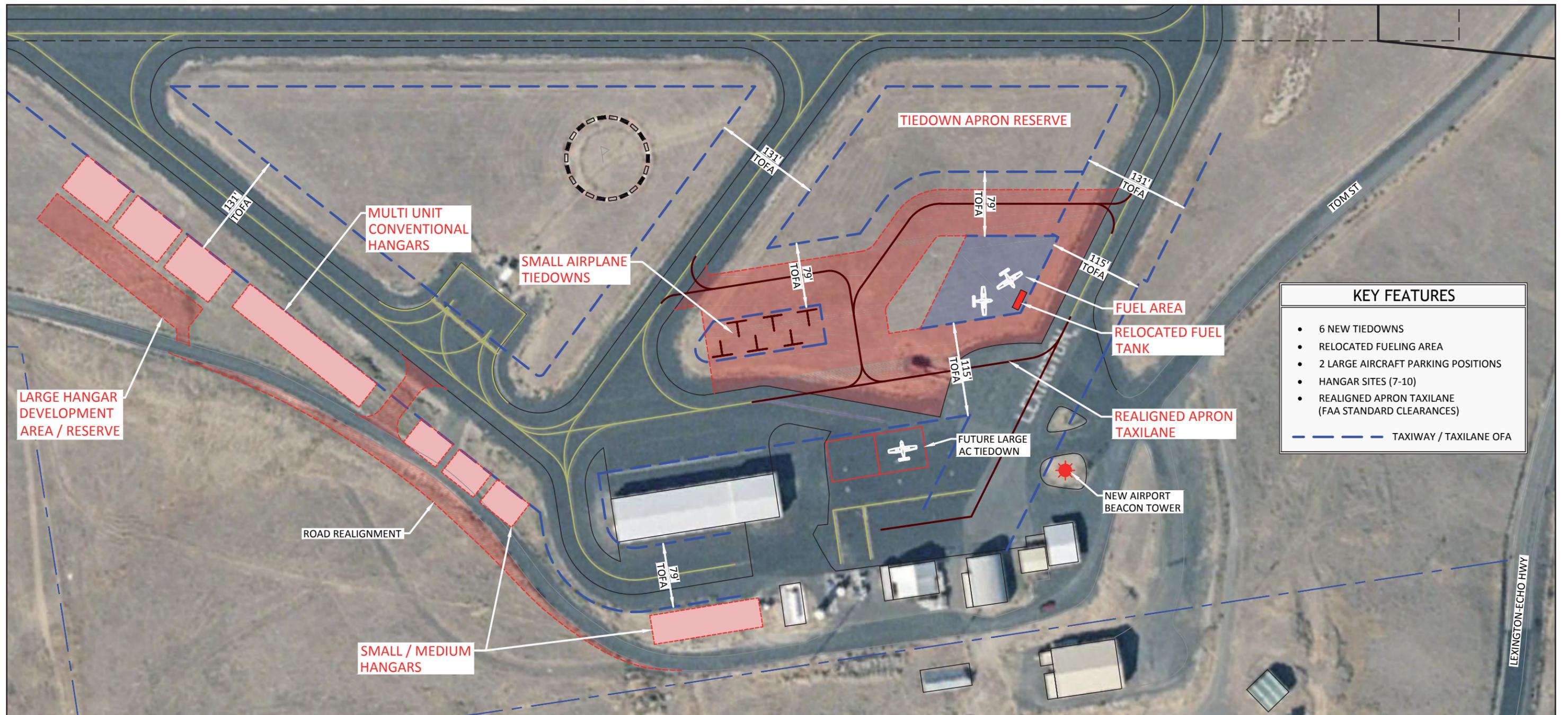
The main apron is reconfigured to accommodate two large aircraft parking position. The parking positions are accommodated entirely within the existing apron pavement, along the south edge of the main apron access taxilane. The parking positions would accommodate transient aircraft including business or medevac fixed wing aircraft and helicopters.

Option B includes sites for multi-unit or conventional hangars. The new hangar sites are located near the west end of the main apron, and extend northward along the west access taxiway. As depicted, the development exceeds forecast demand by a considerable margin; however, the layout is intended to illustrate the variety of hangar types that could be constructed including small, medium, and large conventional hangars, and one-sided multi-unit hangars. The use of one-sided hangars reflects site topography and apron/taxiway configurations. The cost of filling the downhill side of the hangar sites in



order to construct taxilanes and access road would be substantial, which would impact the overall cost of construction. Limiting the depth of the site development and using one-sided hangars reduces fill requirements.

The hangar sites located past the agricultural aircraft apron can be developed without any changes to the existing gravel access road. The hangar sites located near the west end of the apron require a minor realignment of the access road to site hangars clear of the adjacent taxiway object free area. Vehicle access to the agricultural apron would also be modified as part of the road realignment. A 3-unit hangar is depicted near the southwest corner of the main apron that would accommodate small airplanes with access provided by the adjacent apron taxilane.



KEY FEATURES	
•	6 NEW TIEDOWNS
•	RELOCATED FUELING AREA
•	2 LARGE AIRCRAFT PARKING POSITIONS
•	HANGAR SITES (7-10)
•	REALIGNED APRON TAXILANE (FAA STANDARD CLEARANCES)
---	TAXIWAY / TAXILANE OFA

LANDSIDE OPTION B





Preferred Development Alternative

The preliminary development alternatives, presented earlier in the chapter, were designed to accommodate the forecast aviation demand and the corresponding facility requirements for Lexington Airport described in Chapter 4 for the twenty-year planning period (2014-2034).

The preliminary development alternatives were presented to the Master Plan Advisory Committee, County staff, County Commissioners, and the general public at meetings held in summer 2014. The draft documents were also submitted to FAA and the Oregon Department of Aviation for review and comment.

Based on the wide range of input provided during these meetings and through subsequent discussions, the elements of the preferred alternative were formed. Additional coordination with Morrow County Public Works (airport management) staff led to further refinement and the concepts were prepared for presentation. The preferred alternative presented in this section was presented to the Morrow County Court as a “preliminary preferred alternative” for review and approval. Additional coordination with County staff and the FAA led to additional refinement of the concepts before being presented to FAA for final review.

The components of the preferred development alternative are presented in **Figure 5-4**. These improvements were refined and incorporated into the Airport Layout Plan (ALP) and Capital Improvement Program (CIP) and presented for public and agency review in the Draft Final Airport Master Plan. The final version of the ALP drawing set is presented in Chapter 8.

Below is a short summary of key items:

AIRSIDE (RUNWAY-TAXIWAY)

Runway

There are no physical changes proposed for Runway 8/26 aside from upgrading the markings on Runway 8 to nonprecision instrument (NPI) to be consistent with current instrument approach capabilities.

Adequate land area exists west of the runway, should the County wish to consider identifying a runway extension reserve to accommodate demand that may occur beyond the airport master plan’s 20-year planning period. No projects related to a runway reserve are included in the updated 20-year capital improvement program.

The runway obstacle free zone (OFZ) is widened from 250 feet to 400 feet based on the requirements of the current and future design aircraft. The grading requirements of the 500-foot wide runway object free area (OFA) adequately addresses OFZ grading requirements; however, the wider OFZ requires that the existing aircraft hold lines and signs on each taxiway connection (125 feet from runway centerline) be



relocated to the edge of the OFZ (200 feet from runway centerline). The aircraft hold area located adjacent to the Runway 8 threshold cannot be relocated to clear the OFZ and will be converted to a turnaround until the area is expanded or modified as part of a future parallel taxiway extension.

Crosswind Runway

An evaluation of wind coverage was conducted for Runway 8/26 based on historic wind data collected by the National Weather Service from the onsite Automated Weather Observation System (AWOS). The analysis indicates that Runway 8/26 accommodates approximately 93.74 percent of wind conditions at 10.5 knots (12 mph), the crosswind component used for small airplanes and 96.07 percent at 13 knots (15 mph), the crosswind component used for large (above 12,500 pounds) general aviation airplanes.

Based on FAA criteria, single runway airports with less than 95 percent crosswind coverage meet the basic eligibility requirements for FAA funding a second (crosswind) runway. However, the FAA considers crosswind runways to be a low priority in most cases, particularly when the primary runway accommodates more than 90 percent of wind conditions. Preliminary consultation with FAA confirmed that a crosswind runway project at Lexington Airport would be a very low priority based on the current wind coverage (for design aircraft category), the relatively low volume of air traffic at the airport, and the significant cost associated with building an additional runway. The ability to fund a crosswind runway without FAA participation is limited and would consume a disproportionate amount of local resources available for airport maintenance, operations, and improvements. For these reasons, additional evaluation of crosswind runway options was not performed.

Taxiways

A western extension of the south parallel taxiway is recommended to provide safe and efficient aircraft movement within the runway-taxiway system and convenient access between the runway and the landside area. An aircraft hold area is identified at the west end of the taxiway to allow efficient movement of aircraft. Due to the significant slope along the south side of the runway, the embankment for the aircraft holding area will extend beyond airport property. Based on preliminary fill calculations, approximately 2.3 acres of property acquisition will be required to accommodate the expanded embankment. The south parallel taxiway will be designed to meet airplane design group II (ADG II) standards.

An additional exit taxiway is identified near the east 1/3 of the runway and the south parallel taxiway. The exit taxiway would be used by aircraft landing on Runway 8 that are unable to use the current exit located west of mid-runway and for aerial applicator aircraft landing on Runway 26 to expedite movement to adjacent operations areas. The offset taxiway connection to the south parallel taxiway conforms to current FAA guidance on runway-taxiway safety.



LANDSIDE (TERMINAL AREA)

Improvements to the terminal area include reconfiguration/expansion of the existing aircraft tiedown apron, reconfiguration of aircraft taxilanes, and relocation of the aircraft fueling area. The primary changes to the existing apron involve reconfiguration of aircraft tiedowns and taxilanes to meet FAA taxilane clearance standards. The preferred option upgrades the main apron taxilane to Airplane Design Group II (ADG II) standards. The new section of apron will provide small airplane parking and a reconfigured fueling area with ADG I standards.

Improved vehicle access (minor realignment) will be provided to the western section of the terminal area for new hangars and the existing aerial applicator apron. The hangar area will accommodate large and small hangars between the access road and the west access taxiway.

PROPERTY ACQUISITION

As noted earlier, approximately 2.3 acres of property acquisition is required to accommodate a new aircraft hold area on the south parallel taxiway extension.

