Prior to updating the development program for New Century AirCenter (IXD), it is important to review development potential and constraints at the airport. The purpose of this chapter is to consider the actual physical facilities which are needed to accommodate projected demand and meet the program requirements as defined in Chapter Three - Airport Facility Requirements.

The facility considerations for IXD can be categorized into two functional areas: the **airside** (airfield) and **landside** (terminal, hangars, apron, and auto parking). Within each of these areas, specific facilities are required to meet Federal Aviation Administration (FAA) design criteria as well as safety and security issues. Other facility needs are related to demand that can be expected to be generated in coming years. Although each functional area is treated separately, planning must integrate the individual requirements so they complement one another.

Any development proposed by a master plan evolves from an analysis of projected needs. Though the needs were determined by the best methodology available, it cannot be assumed that future events will not change these needs. The master planning process attempts to develop a viable concept for meeting the needs caused by projected demands through the planning period.

As indicated in earlier chapters, this master plan is not the first to be developed for this airport. The last master plan was approved in 1988. Since that time, the airport has moved forward on many of the previous recommendations. Therefore, it is helpful to reexamine the basis of that plan, the development that has occurred, as well as any revisions that
have been made to the Airport Layout Plan (ALP) since that time. Still-valid concepts may then be retained, while new concepts are developed for those issues that are either no longer valid or considered to be unacceptable or unworkable. Thus, the discussions of this chapter lead off with a review of the 1988 master plan.

**REVIEW OF PREVIOUS PLANNING**

The previous master plan for New Century AirCenter was completed in 1988, when the airport was referred to as the Johnson County Industrial Airport. At that time, the airport was projected to exceed its annual service volume (ASV) of 179,000 annual operations. As a result, significant airfield improvements were recommended, including the addition of a parallel runway and associated taxiways. The previous master plan also identified an opportunity for both commercial air passenger service, as well as significant air cargo operations. Exhibit 4A presents the recommended concept from the 1988 master plan.

Anticipating frequent use by the Boeing 727 and MD-80 (ARC D-III) and the Boeing 757 (ARC D-IV), the previous master plan recommended an extension of the primary runway to 8,500 feet. This extension was designed to accommodate those aircraft that were forecast to use the airport for air passenger and large scale air cargo operations. As discussed in the previous chapter, the environment for air passenger service and large scale air cargo facilities has changed significantly and is not likely to become a reality at New Century AirCenter.

The previous master plan indicated an increasing trend in annual operations to the point where airfield capacity would become constrained. To alleviate this potential situation and provide for greater overall airfield capacity, a 7,500-foot parallel runway situated 4,300 feet to the east of existing Runway 18-36 was planned. The proposed parallel runway would allow the airport to have two fully instrument-equipped runways which could be used simultaneously to better serve the mix of commercial service, military, and general aviation operations. Updated operational forecasts presented in this study, however, indicate that additional airfield capacity, as provided by a full-length parallel runway, will not be needed over the course of the 20-year scope of this master plan. This is especially true now that commercial service operations are not likely to materialize at New Century.

Other development recommendations from the previous master plan called for the development of a passenger terminal building, air cargo terminal facilities, and general aviation facilities. The plan proposed the development of these facilities situated southeast of the airfield in an undeveloped area of the airport. Most of this area was planned for a new airline passenger terminal complex, complete with a new passenger terminal building and air cargo sorting facility both supported with aircraft apron, automobile
parking, and new access roads. The plan also allowed for the construction of a new airport traffic control tower (ATCT), aircraft rescue and firefighting (ARFF) facility, and additional aircraft hangars. As indicated above, commercial service operations are not likely at New Century for the foreseeable future. For this reason, the southeastern portion of the airport can now be developed for other uses.

The following sections will address the revised airside and landside needs to meet projected long term aviation demand presented in Chapter Two - Aviation Forecasts.

**NON-DEVELOPMENT ALTERNATIVES**

Non-development alternatives include the "no-build" or "do nothing" alternative, transferring service to an existing airport, or developing an airport at a new location. These alternatives need to be examined first to determine whether future development of New Century AirCenter is in the best interest of Johnson County, nearby cities, and the region as a whole.

**“DO NOTHING” ALTERNATIVE**

The "do nothing" alternative essentially considers keeping the airport in its present condition and not providing for any type of improvement to the existing facilities. The primary result of this alternative would be the inability of the airport to satisfy the projected aviation demands of the airport service area.

The Johnson County region has experienced strong growth in all socioeconomic categories over the past several decades. Forecasts indicate this trend will likely continue throughout and beyond the long range planning horizon. These reasons, combined with favorable regional and national aviation forecasts, indicate a future need for improved facilities at New Century AirCenter. Improvements recommended in the previous chapter include improvements to the taxiway system, improvement of navigational aids, and the construction of additional hangar facilities. Without these facilities, regular users and potential future users of the airport will be constrained from taking maximum advantage of the airport’s air transportation capabilities.

The “do nothing” alternative would lead to the airport’s inability to attract potential airport users. Corporate aviation plays a major role in the transportation of business leaders and key employees. Thus, an airport’s facilities are often the first impression many corporate officials will have of the community. If the airport does not have the capability to meet the hangar, apron, or airfield needs of potential users, the County’s capability to attract the major sector businesses that rely on air transportation could be diminished.

The long term consequences of the “do nothing” alternative extend beyond Johnson County. New Century AirCenter is part of a system of public
airports that serve the aviation needs of the region. New Century AirCenter is a reliever to Kansas City International Airport. As such, the airport’s role is to provide adequate facilities to support the full range of general aviation activity so as to reduce congestion and relieve capacity constraints at the commercial service airport. Thus, the effects of the “do nothing” alternative would not only impact Johnson County, but also the entire region. Therefore, the “do nothing” alternative is not considered to be prudent or feasible.

TRANSFER AVIATION SERVICES

The alternative of shifting aviation services to another existing airport was found to be an undesirable alternative due to the lack of available airports having the facilities or the potential that New Century AirCenter provides. In 2004, New Century AirCenter based 185 aircraft and experienced an estimated 54,000 total operations.

Gardner Municipal Airport, three miles to the southwest, has a single, paved runway that is 2,960 feet long. The airport’s other two runways are constructed of turf which limits their use to small aircraft. This airport is only capable of absorbing a limited number of small general aviation aircraft, most likely single engine aircraft. More importantly, the airport is experiencing developmental pressures. Gardner is growing at a rapid pace and the areas north of the airport are becoming densely populated with residential development.

Johnson County Executive Airport is approximately seven miles to the east and is served by a single runway which is 4,098 feet long. This airport is constrained from further growth both on the landside and the airside. The current airport master plan for Executive is considering limited improvements with no additional runway extensions. Therefore, the large aircraft at New Century would be incapable of relocating to this airport.

Lawrence Municipal Airport is 19 miles to the northwest of the airport. The longest runway is 5,700 feet and is supported by an ILS approach. This airport could absorb some activity from New Century AirCenter but would be very inconvenient. The airport is nearly 30 miles from the economic center of Johnson County in Overland Park. The runway cannot support the operations by D-III and larger aircraft, as New Century AirCenter can, without tremendous expense.

Kansas City International Airport (MCI) could support a transfer of some of New Century AirCenter’s aviation activity but in a limited capacity. MCI is nearly 40 miles from IXD and the Johnson County economic center. This is also the commercial service airport for the metropolitan area. IXD specifically serves the role to diminish excess general aviation activity at MCI.

Charles B. Wheeler Kansas City Downtown Airport (MKC) also supports a longer runway similar to that provided by New Century AirCenter. It is located 22 miles to the northeast.
MKC has limited development capacity and cannot easily absorb existing and future aviation demand activity from IXD.

If a shift of aviation services to either Kansas City International Airport or Kansas City Downtown Airport were pursued, current users of New Century AirCenter would be forced to travel to a more distant and less convenient airport. Furthermore, the continuing growth expected in the Johnson County area demonstrates the need for a highly-functional and convenient airport.

General aviation airports play a major role in the way companies conduct their business. These airports are becoming increasingly important in the post-9/11 aviation environment. Corporate aircraft use is becoming more affordable not only for businesses, but also for individuals. New Century AirCenter is expected to accommodate business aircraft traffic for companies located or conducting business in Johnson County. This role is not easily replaced by another existing airport in the system without tremendous expense and inconvenience. Thus, shifting aviation demand to another regional airport is not considered prudent or feasible at this time.

**CONSTRUCTION OF A NEW AIRPORT SITE**

The alternative of developing an entirely new airport facility in the area to meet projected aviation demands was also considered. This alternative was similarly found to be unacceptable, primarily due to economic and environmental considerations. Land acquisition, site preparation, and the construction of a new airport near an urbanized area can be a very difficult and costly action. Closing New Century AirCenter would mean the loss of a substantial investment in a sizable transportation facility. In a situation where public funds are limited, the replacement of a functional and expandable airport facility would represent an unjustifiable loss of a significant public investment.

From social, political, and environmental standpoints, the commitment of a large land area must also be considered. The public sentiment toward new airports is generally negative, as a new airport typically requires the acquisition of several large parcels of privately-owned property. Furthermore, the development of a new airport similar to New Century AirCenter would likely take a minimum of seven years to become a reality. The potential exists for significant environmental impacts associated with disturbing a large land area when developing a new airport site.

The only condition at which evaluating a new airport site would be considered feasible is if the current site becomes constrained or incapable of accommodating aviation demand. It appears that there is space for potential airfield expansion if needed. It is anticipated that the airport will not become so constrained as to prevent
future growth through the long term planning period.

Overall, the non-development alternatives are considered unreasonable and should not be pursued at this time. New Century AirCenter is fully capable of accommodating the long term aviation demands of the area and should be developed in response to those demands. The airport has the potential to continue to develop as a quality general aviation airport that could greatly enhance the economic development of the community.

The previous chapter identified facilities necessary to meet the forecast demand throughout the planning period. The purpose of the remainder of this chapter is to evaluate alternatives that meet the needs of the airport. Necessary facility and airport design issues are examined in the discussion to follow.

AIRFIELD ISSUES

A commitment to remain at the existing site and develop facilities sufficient to meet the long term aviation demands entails the following requirements:

- Provide sufficient airside and landside capacity to meet the long range planning horizon demand levels of the area.
- Develop the airport in accordance with the currently established Federal Aviation Administration (FAA) criteria.

Chapter Three - Facility Requirements outlined specific types and quantities of facilities necessary to meet projected aviation demands throughout the planning period. Expansion will be required to meet the long range planning horizon level of demand. The remainder of this chapter will describe various alternatives for the airside and landside facilities. Before actual airside and landside alternatives are presented, however, it is necessary to discuss items which are factored into the development of the various alternatives. Exhibit 4B outlines alternative issues to be considered in this analysis.

RUNWAY LENGTH

Analysis in the previous chapter indicated that Runway 18-36, at 7,339 feet, provides adequate length for nearly all general aviation airplanes. This length will also provide the necessary length for many larger commercial/cargo airplanes. Thus, it is not anticipated that additional runway length will be necessary during the scope of this plan. Should a specific need arise, such as the basing of a cargo operation utilizing large cargo airplanes, then the airport should consider additional runway length as needed.

The previous master plan indicated a possibility of a need for a northerly runway extension that would bring Runway 18-36 to 8,500 feet in length. Although aviation forecasts do not anticipate a need for this extension based on itinerant operations, there is the possibility of unanticipated frequent
AIRFIELD CONSIDERATIONS

- Consider current and future runway length needs
- Land acquisition
- Analysis of improved instrument approach procedures
- Consider potential parallel runway and location
- Consider FAA design criteria up to airplane design group IV

LANDSIDE CONSIDERATIONS

- Provide for separation of activity levels
- Maximize available property for facility development
- Develop conventional, executive and T-hangars
- Apply design standards for separation distances
- Locate replacement ATCT
use of the airport by larger commercial-type jets. Many larger jets such as the Boeing 757 and 767, as well as even older jets such as the Boeing 727 and 737, are beginning to enter the private market. It is possible that a smaller cargo operator using these types of aircraft could choose to operate from New Century AirCenter. Should this happen, the longer runway would then be necessary. For these reasons, it is prudent to consider extending Runway 18-36 to an ultimate length of 8,500 feet. Based on forecasts, the extension would be necessary beyond the 20-year long term of this plan.

To remove the consideration of a northerly runway extension from the plan altogether would be short-sighted. Without the extension in the plan, additional airport property may become available for development. Once property is developed, it is very difficult and may be impossible to reacquire the property or change its use to make room for an extension. Moreover, if the extension is required, it must be included first on the Airport Layout Drawing (ALD). Having the extension on the ALD will not be an approval and/or commitment for its funding or development by either the FAA or Johnson County Airport Commission. It would simply provide an opportunity to expedite the process if the need ever arises.

The crosswind Runway 4-22 is 5,130 feet long by 100 feet wide. The length and width should be maintained through the planning period primarily to provide for critical crosswind coverage. It should also be maintained in order for the airport to remain operational for most aircraft when the primary runway is closed.

Runway 18-36 is currently 150 feet wide. Airport design standards for the future critical aircraft in ARC D-II call for the primary runway to be, at a minimum, 100 feet wide. The runway was recently narrowed to 150 feet from 200 feet. Consideration should be given to maintaining the runway width at 150 feet, as some Group III aircraft (e.g., BBJ and 727) in Airplane Design Group (ADG) IV require a 150-foot wide runway.

**TAXIWAYS**

The taxiway system at an airport consists of all aircraft transport surfaces, excluding the runway. It is typically designated with a yellow centerline for the movement of aircraft to and from the runways. Taxiways are the primary transport surfaces linked with the runway and its operation. Such surfaces would include a parallel taxiway, entrance/exit taxiways, and connecting taxiways.

Taxilanes are those surfaces that would typically realize a lower level of aircraft activity because the taxilanes provide direct ingress/egress to a specific location or airport facility. An example of a taxilane would be the surface which links to a T-hangar complex. Not all aircraft will use that surface; only those going to and from the T-hangars.

The current layout of the taxiway system at New Century AirCenter is
functional, but improvements could be made to facilitate greater circulation. There are only two entrance/exit taxiways from the primary runway to the westside development. The bisecting crosswind runway provides a third access point for the west side, although using the crosswind runway as a taxiway is less than ideal. There is only one entrance/exit taxiway leading to the eastside development. Alternatives to follow will consider improving the functional layout of the taxiway system.

Taxiways for aircraft in ADG II should be at least 35 feet wide, while they should be 50 feet wide for aircraft in ADG III. All existing taxiways supporting aircraft in ADG III are at least 75 feet wide, while the northern portion of the parallel taxiway is 100 feet wide. All taxiways will be considered to be maintained at their current width, while any new taxiways will be designed to meet the requirements of the critical aircraft they will serve.

Runway and parallel taxiway separation standards consider both the critical aircraft and the instrument approach minimums. The current and future critical aircraft falls in ARC C/D-II. The current lowest approved visibility minimum is one-half mile. This combination necessitates a separation, centerline to centerline, of 400 feet. The current runway/taxiway configuration meets this standard.

PARALLEL RUNWAY

The recommended concept of the previous master plan included a parallel runway situated 4,300 feet to the east of Runway 18-36. This parallel runway was to have an ultimate length of 7,500 feet and was designed to meet a number of forecast and anticipated needs.

It was forecast that annual operations would exceed the airport’s annual service volume, thus creating significant capacity issues. The single most-effective method of adding capacity is to utilize a parallel runway system. The previously recommended configuration could support simultaneous operations, even in poor weather conditions, and provided capacity for 320,000 annual operations. In addition, the airport was anticipated to support scheduled commercial service as well as significant air cargo operations.

Since the previous master plan was completed, the commercial service potential for New Century AirCenter has changed significantly. As presented in the previous chapter, commercial air service is extremely unlikely and air cargo operations may occur, but would be on a limited basis, if at all. As a result, a parallel runway to the size and service potential of the one presented in the previous master plan is no longer needed. For this reason, this study will no longer consider the development of a parallel runway similar to the one presented in the previous plan.
A parallel runway designed to primarily serve training operations and small aircraft in ARC A and B should be considered. A parallel runway designed for general aviation aircraft could only serve to relieve the primary runway of smaller and slower aircraft, allowing larger and faster aircraft greater access to Runway 18-36. This parallel runway could also allow New Century AirCenter greater flexibility to serve Johnson County and the southwest Kansas City metropolitan area. Airports such as Johnson County Executive and Gardner Municipal face significant development constraints. For this reason, a greater share of future aviation demand may need to be met at New Century AirCenter. If this condition is not planned for at this time, the opportunity for developing such a runway in the future could be lost.

This parallel runway should ultimately be planned for at least 5,000 feet in order to accommodate all small aircraft and a portion of those aircraft over 12,500 pounds, such as smaller business jets. Moreover, the availability of a 5,000-foot parallel runway would also allow the airport to handle most aircraft when the primary runway is closed due to maintenance or emergency.

**INSTRUMENT APPROACHES**

Many reliever airports have approved instrument approaches with visibility minimums as low as one-half mile and 200-foot cloud ceiling height. This is referred to as a Category (CAT) I approach. At this time, CAT I approaches require a sophisticated approach lighting system, a glide-slope antenna, and a localizer (known collectively as an instrument landing system or ILS). Runway 36 is equipped with a CAT-I ILS approach. All other runway ends are approved for approaches with one mile visibility minimums.

As discussed in Chapter Three - Facility Requirements, Runway 18 will be considered for a CAT I-type approach. An obstruction-free threshold siting surface (TSS) and the upgrade of the existing approach lighting system to a medium-intensity approach lighting system with runway alignment indicator lights (MALS) is required to meet FAA requirements for a CAT I approach.

Currently, Runway 4-22 is served by a circling VOR-A approach with one mile visibility minimums. Each end should be considered for a straight-in, global positioning system (GPS) approach with not lower than one mile visibility minimums.

**LANDSIDE ISSUES**

The orderly development of the airport terminal area, those areas along the flight line parallel to the runways, can be the most critical, and probably the most difficult to control on the airport. A development approach of taking the path of least resistance can have a significant effect on the long-term viability of an airport. Allowing development without regard to a functional plan could result in a haphazard array of buildings and small
ramp areas, which will eventually preclude the most efficient use of valuable space along the flight line.

Activity in the terminal area should be divided into high, medium, and low-intensity levels at the airport. The high-activity area should be planned and developed to provide aviation services on the airport. An example of the high-activity area is the airport terminal building and adjoining aircraft parking apron, which provide outside storage and circulation of aircraft. In addition, large conventional hangars housing fixed base operators (FBOs), corporate aviation departments, or storing a large number of aircraft would be considered a high-activity use. A conventional hangar structure in the high-activity area should be a minimum of 6,400 square feet (80 feet by 80 feet). The best location for high-activity areas is along the flight line near midfield, for ease of access to all areas of the airfield.

The medium-activity use category defines the next level of airport use and primarily includes smaller corporate aircraft that may desire their own executive hangar storage on the airport. A hangar in the medium-activity use area should be at least 50 feet by 50 feet, or a minimum of 2,500 square feet. The best location for medium-activity use is off the immediate flight line, but still readily accessible. Parking and utilities such as water and sewer should also be provided in this area.

The low-activity use category defines the area for storage of smaller single and twin-engine aircraft. Low-activity users are personal or small business aircraft owners who prefer individual space in shade or T-hangars. Low-activity areas should be located in less-conspicuous areas. This use category will require electricity, but generally does not require water or sewer utilities.

In addition to the functional compatibility of the terminal area, the proposed development concept should provide a first-class appearance for New Century AirCenter. Consideration to aesthetics should be given high priority in all public areas, as the airport can serve as the first impression a visitor may have of the community.

The development of landside facilities considers general aviation facility development providing for separation of activity levels. The goal of the alternative analysis is to indicate development potentials which would provide the airport with a specific goal for future development. The resultant plan will aid the airport in strategic marketing of available properties. The landside development alternatives analysis utilizes accepted airport planning methodologies in conjunction with FAA AC 5300/13, Change 8, Airport Design.

The landside alternatives described are not the only options for development. In some cases, a portion of one alternative could be intermixed with another. Also, some development concepts could be replaced with others. The final recommended plan, to be presented in Chapter Five - Airport Plans, serves as a guide for airport management. Many times, airport
operators change their plans to meet the needs of specific users. The goal in analyzing landside development alternatives is to focus future development so that airport property can be maximized.

There are a number of local planning requirements that have been taken into consideration when developing the landside alternatives. The current fire code requires that hangars be separated by at least 50 feet. In addition, the doors, whether folding or sliding, to the hangars are required to face a direction other than public streets.

Each of the landside alternatives presented reflects the ultimate build-out potential for the airport. What is presented exceeds the aviation needs forecast over the next 20 years. This analysis is designed to provide a planned ultimate direction for airport development. Staging of the development to meet demand-based indicators as well as comprehensive financial plans will be presented in Chapter Six, once the final master plan concept is determined.

**ALTERNATIVES**

The alternatives considered are compared using environmental, economic, and aviation factors to determine which of the alternatives will best fulfill the local aviation needs. With this information, as well as the input and direction from local government agencies and airport users, a final airport concept can evolve into a realistic development plan.

Three different alternatives are presented for the ultimate build-out potential of New Century AirCenter. Each alternative will address both airside and landside development because adjustment to one will have an effect on the other. There are any number of potential development alternatives for the airport. These three alternatives attempt to identify an airport development pattern that is fiscally feasible, functionally reasonable, and considerate of FAA airport design requirements as well as accepted industry standards.

**AIRPORT ALTERNATIVE 1**

The goal of this alternative is to develop a secondary parallel runway that will accommodate smaller general aviation aircraft. The proposed parallel runway is located approximately 2,600 feet to the east of the primary runway. This development will separate activity by larger business jets and cargo aircraft from smaller single and multi-engine training operations.

**Airside Development**

Airport Alternative 1 features a parallel runway on the east side of the airfield. As previously discussed in Chapter Three - Facility Requirements, a capacity-relieving parallel runway is not forecast to be necessary within the 20-year scope of this master plan. The previous master plan included such a parallel runway, 7,500 feet in length, and designed to accommodate busy periods of large aircraft operations.
The FAA provides guidance for planning of capacity-relieving parallel runways in Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*. According to the AC, a new runway designed to serve the same aircraft as the primary runway can be considered when annual operations exceed 60 to 75 percent of capacity. The AC also indicates that the current runway system can provide for approximately 230,000 annual operations before delays become exponential.

The FAA provides additional guidance for planning of runways in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS). A short parallel runway may be considered when the airport reaches 75,000 total operations or 20,000 itinerant operations. Forecasts presented in Chapter Two - Aviation Demand Forecasts, indicate that the airport currently supports approximately 27,000 itinerant operations and is forecast to reach 75,000 annual operations by the intermediate term of this master plan. The runway will also have the added benefit of increasing airfield capacity to approximately 285,000 annual operations.

The parallel runway presented in Airport Alternative 1 is designed to accommodate small aircraft (those under 12,500 pounds). To accommodate all small aircraft, the FAA recommends a runway length of 4,500 feet. This parallel runway is designed to an ultimate length of 5,000 feet, which will accommodate all small aircraft as well as a significant portion of larger business jet aircraft should the primary runway be closed for any period time in the future, typically due to maintenance activity.

The design of the parallel runway would be to airport reference code (ARC) B-II. This design standard calls for a runway/taxiway separation of 240 feet. The runway is considered for instrument approaches with visibility minimums not lower than one mile. As depicted on Exhibit 4C, the southern 300 feet of runway would extend beyond airport property. In addition, both runway protection zones (RPZ) will also extend beyond current airport property. As a result, this alternative would recommend the fee simple acquisition of nine acres to the north and approximately 38 acres to the south.

Primary Runway 18-36 is considered for a potential runway extension of 1,161 feet, which would bring the total available runway length to 8,500 feet. This extension is currently on the recommended plan from the previous master plan. Although forecast demand at the airport does not anticipate a need for this extension within the term of this master plan, it is prudent to plan for this need at some point in the future. This planning effort should include reserving the land necessary for the extension and safety areas until such a time that the project becomes warranted.

Runway 18 is considered for improved instrument approaches. Currently, the RNAV (GPS) and VOR-A circling approaches provide for one-mile visibility minimums. Improved
approaches consider a CAT I-type approach similar to that which exists for Runway 36. A CAT I approach currently requires an ILS and a sophisticated approach lighting system. With a CAT I approach, visibility minimums can be as low as one-half mile and cloud ceiling heights can be down to 200 feet. It should be noted that the FAA is currently developing the Wide Area Augmentation System (WAAS) which should allow precision instrument GPS approaches with CAT I visibility minimums. This system has been slow to develop and the FAA indicates that the system is not anticipated to be fully implemented until 2013.

The proposed development of the taxiway system at New Century AirCenter follows guidelines provided by the FAA. Where possible, a taxing aircraft should be allowed access to both runway ends without crossing the runway. Since FBOs on both the east and west sides of the primary runway provide services for aircraft operators, a parallel taxiway should be provided on both sides of the runway. The proposed eastside parallel taxiway is designed to accommodate aircraft in airplane design group (ADG) III, which requires a 50-foot wide taxiway. All new taxiways designed to serve Runway 18-36 are designed to meet this standard.

The southern portion of the proposed eastside parallel taxiway is designed to provide clearance for the existing glideslope antenna critical area. By designing this ‘jog’ in the parallel taxiway, aircraft will be able to proceed to the south-end hold apron, while approaching aircraft are operating rather than holding on the taxiway approximately 1,500 feet from the Runway 36 end. This design will provide for improved efficiency and capacity at the airport.

The westside parallel taxiway, Taxiway A, is proposed at 75 feet wide. There is currently no westside taxiway that connects to the Runway 18 threshold. The plan considers making this connection and including a hold apron. Future consideration of a runway extension also provides for taxiways and hold aprons.

Taxiways associated with both Runway 4-22 and the future parallel runway are designed to be 35 feet in width. This width will meet FAA requirements for aircraft in ADG II, as the east side of the airfield is anticipated to serve primarily smaller general aviation aircraft.

**Landside Development**

Landside development presented on Exhibit 4C, Airport Alternatives 1, follows the principal of separation of activity levels as previously discussed. All potential westside development is considered for airport businesses and industry. This pattern has been established with the location of Garmin, Honeywell, and Midwest Aerosports.

Potential development of the west side is somewhat constrained at this point. The only significant property available for development is on the southwest end of the runway, south of Midwest...
Aerosports. This development area shows potential for eight hangars, each measuring 120 feet by 120 feet. The airport recently constructed Highland Drive in order to provide access to this area. Utilities and other infrastructure are easily accessible. This area should be considered for private development of aviation-related businesses and industry.

The eastside development considers the addition of three T-hangars to the north and two large conventional hangars. Additional apron area is also included with the new conventional hangars. Development of the potential parallel runway follows the separation of activity levels philosophy. Low-activity T-hangars are located on the ends. Medium-activity executive hangars are next to the T-hangars and high-activity FBOs and corporate hangars are located midfield.

As discussed previously, the airport should consider a replacement airport traffic control tower (ATCT). The location of such a tower is dependant upon a number of factors. The primary consideration for this master plan is to provide a clear line-of-sight to all runway ends. For Airport Alternative 1, the location adjacent to the eastside Executive Beechcraft hangar is considered. This location provides line-of-sight to all runway ends. In addition, this location will not lead to restrictions for potential industrial developers of the infield between the two runways. ATCT siting criteria will be discussed in depth later in this chapter.

**AIRPORT ALTERNATIVE 2**

This alternative brings the parallel general aviation runway to 700 feet from the primary runway. The runway is again intended for smaller general aviation training and itinerant operations. This design limits property acquisition necessary and maintains a compact airport development pattern.

**Airside Development**

Airport Alternative 2 presents a parallel runway at the FAA minimum separation from the primary runway. As depicted on Exhibit 4D, the parallel runway is 700 feet, centerline to centerline, from Runway 18-36. The parallel runway has an ultimate length of 5,400 feet. The southernmost 2,200 feet of the parallel taxiway serving the runway would extend beyond the existing airport property line. This alternative would require the acquisition of approximately 24 acres, which includes the RPZ, through fee simple acquisition. A parallel runway at 700 feet of separation will have the added benefit of increasing overall airfield capacity to 275,000 annual operations.

As discussed in the previous airport alternative, this runway would be designed to ARC B-II standards. The runway/taxiway separation minimum is 240 feet and the separation presented is 300 feet, in order to position the runway to conform to ARC C-II standards should that be necessary at some point.
in the future. The taxiways associated with Runway 4-22 are also considered at a 300-foot separation.

Due to the current configuration of the runway system, this runway is ultimately planned for a length of 5,400 feet. Typically, the FAA would support an initial construction of 4,500 feet in order to accommodate all small aircraft, with the ultimate length being achieved as demand dictates. Both runway ends are considered for instrument approaches with one mile visibility minimums.

This alternative also considers 50-foot-wide taxiways associated with Runway 18-36 and 35-foot taxiways associated with the potential parallel runway. The southern portion of an eastside parallel taxiway to Runway 18-36 would require relocation of the glideslope antenna. This portion of the taxiway is not considered for construction until such time that the glideslope is no longer necessary. Once the FAA implementation of WAAS allows for CAT I approaches, the glideslope may be removed and the remaining parallel taxiway can be constructed.

Primary Runway 18-36 is also planned for a northerly extension, which would bring the total runway length to 8,500 feet. This is not anticipated to be necessary during the term of this master plan, but the airport should continue to plan for it as many circumstances could create an immediate need for the extension. Because New Century AirCenter is the only airport in Johnson County with a significant ability to expand, proper planning will continue to identify potential needs beyond the 20-year scope of this Master Plan.

This alternative also considers a full CAT I instrument approach for Runway 18. Due to the abundance of land to the north of the runway, space is available for the addition of the MALSR type of approach lighting system that a CAT I approach currently requires.

**Landside Development**

The landside development alternatives presented on Exhibit 4D consider the full development of the airport as a general aviation facility. Three locations on the west side of the primary runway have been identified for development potential.

The first area lies directly between the current Airport Commission building and the runway. Space exists for up to three large conventional hangars. Those depicted on the exhibit are 200 feet by 200 feet. An apron can also be constructed to accommodate aircraft activity in this area.

Ideal planning would avoid placing these conventional hangars inside the existing set-back line for the other buildings, but with limited westside development space available, this could be appropriate. These hangars would not violate any FAA design standards in terms of location, as they are outside the building restriction line and do not penetrate any airport airspace surfaces.
Additional development space for executive-type hangars has been identified immediately east of Executive Beechcraft. Finally, hangar development space is available to the south of the Midwest Aerosports hangar. This development area is divided into three corporate parcels and can be marketed as improved airside property because the newly constructed Highland Drive and utilities are in close proximity.

Eastside development considers the expansion of the existing T-hangar complex. The access road would need to be relocated in order to provide development space for more of these hangars. Two executive hangars are proposed to be located to the east of the easternmost hanger.

The area to the south of Runway 4-22 and east of the parallel runway is proposed for expanded general aviation development. Large conventional hangars occupy the high-activity central apron area, while executive and T-hangars are set to the sides. The location of the T-hangar complex associated with this infield development would allow for staged development based upon demand, since taxiway access could be readily supplied to Runway 4-22 at the north end.

The airport traffic control tower associated with this development alternative is located on the parcel immediately to the north of the Executive Beechcraft offices. Under this configuration, the tower would be able to have appropriate line-of-sight to all runway ends. For towers that necessarily face a north/south runway, the FAA prefers the tower to face the east rather than the west. For a plan with the parallel runway nearer the primary runway, this is the optimal ATCT location.

**AIRPORT ALTERNATIVE 3**

This alternative most closely resembles the recommended plan from the 1988 Master Plan. Development takes place between the two runways and the parallel runway is separated from the primary runway by 3,900 feet.

**Airside Development**

The third airport alternative is presented on Exhibit 4E. This alternative presents the parallel runway separated from the primary runway at an even greater distance than Alternative 1, allowing for additional hangar development east of the easternmost existing hangar. This alternative also emphasized development of the area between the two runways for general aviation activity.

The parallel runway is again considered for 5,000 feet in operational length. It is located in such a position that existing taxiways can be connected to insure efficiency of aircraft movement. A parallel taxiway is provided at a separation of 300 feet, allowing for expansion of the runway to accommodate aircraft in ARC C-II should that become necessary in the future.
Exhibit 4E

ALTERNATIVE 3

Runway 18-36 7,339' x 150'
Ultimate Runway 18R-36L 8,500' x 150'
Taxiway A
159th Street
New Century Parkway
Gardner Drive
T-Hangars
Conventional Hangars
Executive Hangars
ATCT
Runway 4-22 5,130' x 100'
Old 56 Highway
Existing Airport Property Line
Ultimate Airport Property Line
Runway Safety Area (RSA)
Object Free Area (OFA)
Corporate Parcels
Building Restriction Line (BRL)
Runway Visibility Zone (RVZ)
Runway Protection Zone (RPZ)
Ultimate Airfield Pavement
Ultimate Building
Ultimate Road/Parking
Pavement to be Removed
Crosswind Runway 4-22 is also proposed to be supported with parallel taxiways on each side. These are separated at a distance of 300 feet. The primary runway is supplied with an eastside parallel taxiway that is 50 feet wide, designed to accommodate the larger aircraft that are using that runway. The southern portion of this taxiway is diverted around the glideslope antenna critical area, as was the case in Alternative 1.

Runway 18-36 is again presented with an ultimate length of 8,500 feet.

**Landside Development**

The landside development, presented in Exhibit 4E, focuses primarily on a development pattern between the parallel runways. The layout of facilities continues to provide for separation of activity levels, with T-hangars on the ends and large FBO-type hangars in the center. This development schema allows for the inclusion of non-aviation-related industrial parcels. Revenue from land leases generated by non-aviation industrial development can have significant and positive impacts on airport operating revenue.

The airport traffic control tower is relocated to this centerfield development area. Due to concern for maintaining a line-of-sight for tower personnel to the south parallel runway end, the T-hangars depicted have been set back.

Under this development scenario, future westside development should be reserved for non-FBO businesses with a need for runway access. Some development is available on the northeast side of the airport, as presented on the exhibit.

**AIRPORT TRAFFIC CONTROL TOWER SITING CRITERIA**

The existing ATCT is in need of replacement, as discussed in Chapter Three - Facility Requirements. The current tower sits atop the Army Reserve hangar, which is not ideal considering current military security requirements. The current tower has an obstructed line-of-sight to the Runway 4 end, which is a critical consideration. In addition, the tower is nearly 45 years old and in need of significant repairs and investments to bring it up to current standards.

Each of the three airport alternative exhibits shows a different location for a replacement ATCT. The best possible location for a replacement tower is significantly dependant on the landside alternative or combination of landside elements selected for the recommended concept.

The ATCT is the focal point for controlling flight operations within the airport's designated airspace and all aircraft and vehicle movement on the airport's runways and taxiways. Site selection involves certain mandatory requirements concerning the ultimate planned development of the airport.
The following operational and spatial requirements are identified in FAA Order 6480.4, *Airport Traffic Control Tower Siting Criteria*.

**Mandatory Siting Requirements**

- There must be maximum visibility of airport traffic patterns.
- There must be a clear, unobstructed, and direct view of the approaches to all runways or landing areas and to all runway and taxiway surfaces.
- The proposed site must be large enough to accommodate current and future building needs including employee parking spaces.
- The proposed tower must not violate F.A.R. Part 77 surfaces unless it is absolutely necessary.
- The proposed tower must not derogate the signal generated by any existing or planned electronic navigational aid.

**Nonmandatory Siting Requirements**

- To assure adequate depth perception, the line-of-sight to aircraft movement areas should be perpendicular to the direction of aircraft travel.
- The tower cab should be oriented to face north or alternatively to the east, south, or west. Every effort should be made to prevent an aircraft approach from being aligned with the rising or setting sun.
- The controller's visibility should not be impaired by direct or indirect external lighting sources.
- All aircraft movement areas including parking aprons, tie-down spaces, run-up pads, etc., should be visible from the ATCT.
- Consideration must be given to local weather phenomena to preclude restriction to visibility due to fog or ground haze.
- Exterior noise should be at a minimum and sites should be evaluated for expected noise levels.
- Access to the site should not require controllers to cross a runway or taxiway.
- Consideration should be given to planned airport expansion, especially for the construction of buildings, hangars, runway/taxiway extensions, etc. to preclude the relocation of the ATCT at a later date.

The land area required for a tower site will be one or more acres depending on the types of facilities to be combined at
the site. For New Century AirCenter, an area of up to one acre should be provided for the future site of the ATCT. Adequate access to the facility and appropriate parking should also be provided.

**LINE-OF-SIGHT**

In order to determine actual tower elevations for each site, analysis of cab eye elevation must be conducted. Cab eye elevation is the projected height at which a controller will view aircraft activity from the ATCT.

The analysis of cab eye elevation must factor two considerations: determine the minimum eye level elevation utilizing the criteria provided in FAA Order 6480.4 and evaluate any structures located between the ATCT site and surface movement areas to determine if they may obstruct the line-of-sight. An obstructed view is commonly referred to as a shadow. A tall structure which casts a shadow, or loss of view of a particular surface area, would require the cab eye elevation to be increased in order to view the surface area in question.

Consideration should also be given to alterations or additions to surface movement areas. This chapter is considering the addition of a parallel runway and an extension of the primary runway to 8,500 feet.

**MINIMUM CAB EYE ELEVATION ANALYSIS**

FAA Order 6480.4 provides a method for determining the minimum cab eye elevations for proposed ATCT sites. This calculation was established to meet the minimum requirements for visual depth perception. According to the Order, the line-of-sight from the tower cab eye level must intersect the grade of the airport traffic surface in question (parking apron, taxiway, runway, etc.) at an angle of 35 minutes or greater. The formula provided in the Order and utilized in this analysis is as follows:

\[ E_e = E_{as} + [D \times \text{Tangent (35 minutes} + G_s)] \]

whereas:

- \( E_e \) = Eye level elevation (MSL)
- \( E_{as} \) = Average elevation for section of airport traffic surface in question
- \( D \) = Distance from proposed tower site to section of airport traffic surface in question
- \( G_s \) = Angular slope of airport traffic surface measured from horizontal and in direction of proposed tower site
It should be noted that the cab eye elevation formula provides the height at which a controller will be viewing from. Actual tower heights will be higher to accommodate the cab roof and necessary antenna equipment. It can be expected that the actual tower height will be at least ten feet higher than the cab eye elevation calculation indicates.

SITING ANALYSIS

Three sites have been analyzed and are presented on airport alternatives 1, 2, and 3. When considering ATCT locations, it is important to consider all factors including the cost of construction to both the airport sponsor and the FAA. Locations closer to existing utilities and infrastructure would be less expensive than locations where no utilities and infrastructure currently exist.

The alternative sites have been analyzed and calculations have been made for line-of-sight and cab eye elevation minimums. Each site was evaluated for line-of-sight to each runway end, including to the proposed runway extension threshold. During engineering of the ATCT, further analysis will include compensating for shadows (those surfaces potentially blocked by hangars). The following paragraphs provide specific analysis for each site according to siting criteria established by the FAA.

SITE A

Site A is located on the east side of the airfield to the immediate south of the Executive Beechcraft hangar. This site would be ideal should a parallel runway be planned that opens up the centerfield area for industrial development. By locating the tower here, line-of-sight would be maintained and the distance to each runway end is minimized. This location would also have ready access to utilities, roads, and parking. As depicted on Exhibit 4C, Site A is at an existing ground elevation of approximately 1,088 feet mean sea level (MSL) and is 1,000 feet to the nearest runway.

Cab Eye Elevation

The calculated minimum cab eye elevation for the most demanding pavement surface for this site is 1,160 feet MSL, or approximately 72 feet above ground level (AGL).

Mandatory Siting Requirements

Visibility is clear and unobstructed to all runway ends under Alternative 1. The site is near the north end of the airfield, thus creating a 7,100-foot line-of-sight distance to the Runway 36 threshold. The site allows clear visibility to all existing and proposed runway ends and taxiway surfaces.
This site will not derogate the signal generated by any of the existing or planned navigational aids.

As is the case with many ATCTs, a 72-foot-tall facility located only 1,000 feet from the runway would obstruct the 7:1 transitional surface for precision approaches. Consultation with the FAA would be necessary to get approval for this site.

**Nonmandatory Siting Requirements**

Depth perception of all surface areas to be controlled should be adequate. The controller’s line-of-sight will be perpendicular or oblique, not parallel, to the line established by aircraft and/or ground vehicle movement. The cab eye elevation will intersect all airport surfaces.

The tower cab will be oriented to face south, which is not ideal. Clear visibility of all airport surfaces can be a compensating factor for a south-facing tower.

There are no known local weather phenomena that would restrict visibility for any tower location. Noise levels at this site may be an issue as the location is near high-activity FBO hangars. An appropriate buffer would need to be considered. Access to the site will not cross areas of aircraft operations. No future construction is planned that would derogate visibility from this site.

**SITE B**

As illustrated on Exhibit 4D, Site B is located to the immediate north of the Executive Beechcraft main westside hangar. According to spot elevation information for the airport, the ground elevation for Site B is at approximately 1,066 feet MSL and is situated 900 feet from the runway centerline.

**Cab Eye Elevation**

The calculated minimum cab eye elevation for this site is 1,121 MSL, or 55 feet AGL.

**Mandatory Siting Requirements**

This site on the west side of the airfield is ideal in conjunction with a general aviation parallel runway that is close enough to the primary runway as to prevent the location of future buildings between the two runways.

The tower at this location and calculated height would obstruct the F.A.R. Part 77 transitional surface. This does not preclude construction at this site; it means additional review and analysis will need to be conducted. The site is large enough to accommodate future building needs and employee parking. The site is also near existing utilities and infrastructure.
Nonmandatory Siting Requirements

Depth perception of all surface areas to be controlled should be adequate. The controller’s line-of-sight will be perpendicular or oblique, not parallel, to the line established by aircraft and/or ground vehicle movement. The cab eye elevation will intersect all airport surfaces.

The tower cab would be oriented to face east, which is preferred for east/west facing towers.

Noise levels may be a factor as the tower would be situated between two highly-active FBO hangars. During a siting study, noise attenuation measures should be considered further.

SITE C

Exhibit 4E shows Site C, which is located to the southeast of the existing runway intersection. Spot elevation information for the airport indicates that the ground elevation for Site C is at approximately 1,078 feet MSL.

Cab Eye Elevation

The calculated minimum cab eye elevation for this location is 1,124 feet MSL, or 46 feet AGL.

Mandatory Siting Requirements

Visibility of airborne traffic patterns is good. Visibility is adequate for all primary airport surfaces. This location is considered in conjunction with a general aviation parallel runway located to the east. The centerfield area around the tower is considered for development. Care would need to be given to limit high noise activity around the tower. Any new buildings constructed in the centerfield area would need to be set back an appropriate distance so that line-of-sight is not obstructed.

This site plot provides sufficient area to accommodate the initial building and the addition of a base building in the future if required. Also, this area would readily supply parking areas.

Minimum cab eye elevations for this site indicate that the tower will likely penetrate the F.A.R. Part 77 transitional surface, however, should not be an obstruction to flight. The tower should not derogate the performance of any existing or planned electronic facilities.

Nonmandatory Siting Requirements

Depth perception of all surface areas to be controlled will be adequate. The controller’s line-of-sight will be perpendicular or oblique, not parallel, to the line established by aircraft and/or ground vehicle movement.

The tower cab will be oriented to face north. This orientation is considered ideal for viewing aircraft operations to all runway ends. Visibility to all areas requiring control is excellent and would
not be impaired or shadowed. Access to the site, once constructed, would not require crossing aircraft operation areas.

This site is in an area that is currently undeveloped. Due to this fact, initial construction will likely be more costly than construction in a site where utilities and other infrastructure are already located.

SUMMARY

The process utilized in assessing the airside and landside development alternatives involved a detailed analysis of short and long term requirements, as well as future growth potential. Current airport design standards were considered at every stage in the analysis. Safety, both air and ground, were given a high priority in the analysis of alternatives.

After review and input from the Planning Advisory Committee, County officials, and the public, a recommended concept will be developed by the consultant. The resultant plan will represent an airside facility that fulfills safety design standards and a landside complex that can be developed as demand dictates. The development plan for New Century AirCenter must represent a means by which the airport can evolve in a balanced manner, both on the airside and landside, to accommodate the forecast demand. In addition, the plan must provide flexibility to meet activity growth beyond the long range planning horizon.

The following chapters will be dedicated to refining the basic concept into a final plan, with recommendations to ensure proper implementation and timing for a demand-based program.