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Chapter Four Development Alternatives

INTRODUCTION

The previous section of the master plan, *Facility Requirements*, was completed to determine the airside, landside, and support facility needs of HFJ throughout the 20-year planning horizon. This chapter is intended to identify those development alternatives that will allow HFJ to accommodate projected aircraft and aviation demand activity. In addition, the focus of this chapter is to evaluate the merits and deficiencies of potential capital development for landside and airside alternatives proposed for the Airport. The airport development alternatives analysis for HFJ will examine two conceptual development alternatives including 1) no action and 2) expand the existing airport site.

The development alternatives proposed for HFJ are intended to serve as the formulation of a development concept rather than the presentation of a final design recommendation. While the assessment of runway and terminal area development alternatives are based on economical, operational and practical judgment, the most favorable airfield and terminal area development option should be the one most compatible with the City's goals and objectives regarding planning initiatives, as well as social, political and environmental considerations pertaining to the Monett and Barry, Lawrence and Newton tri-county area as well as the southwest Missouri region.

Lastly, the preferred development alternatives, based on a judgmental assessment of pertinent factors involved with airport expansion, should be the alternative having the greatest potential for implementation.

GOALS AND OBJECTIVES FOR FUTURE DEVELOPMENT

The goals for future expansion of HFJ are established to serve as an understanding and purpose for ensuring continuity for future development and improvements at the facility. These goals and objectives take into account the projected 20-year aviation demand, current and future land use compatibility, public interest and awareness, as well as safety, political, economic, financial and operational conditions specific to HFJ.

The following goals for future implementation of improvements at HFJ are intended to serve as a guide for the preparation of this master plan update including the future development of the Monett Municipal Airport.

- The master plan is intended to provide an effective and rational course of action, considering conditions specific to HFJ, for the recommended

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improvements through the preparation of a capital improvement program that is capable of being implemented and a reasonable expectation of future development potential for HFJ.

- The City of Monett is committed to the development of a safe and efficient facility for public use aviation activity. The City also intends to acquire property, when available, that is required per FAA planning criteria in an effort to ensure compatible land use in the vicinity of HFJ and to allow for future airfield expansion.
- Mitigation of any known non-standard airfield and/or terminal area conditions that will enhance the safety and efficiency of the Airport. This includes the mitigation of man-made and natural obstructions of the airspace surfaces, particularly the approach surfaces to the runway.
- The selected airfield and terminal area development alternatives recognize the importance of the Airport's service role within the tri-county area and southwest Missouri region. The preferred development alternatives also propose airfield and terminal area expansion options that best fit the needs of the City and users of HFJ.
- The current instrument approach capabilities for Runway 18-36 are recommended to be maintained and maximized to the extent feasible throughout the planning period, particularly to the Runway 36 threshold, to ensure enhanced instrument approach capabilities to the Airport.
- Runway 18-36 is recommended to be expanded to the extent feasible to accommodate 100 percent of the general aviation fleet at 60 percent useful load. At minimum, this development proposal will include the expansion of 18-36 to 5,900' x 100' and involve the development of a new paved landing surface to the west of the existing runway.
- Expansion of the terminal area complex is expected to involve the development of numerous additional T-hangars and clear span hangars as well as reconfiguration and expansion of the aircraft apron. These improvements will ensure that HFJ's terminal area complex accommodates existing and projected demand throughout the 20-year planning period.
- In the interim, in an effort to provide large cabin class aircraft additional runway length for departures to the south during wet and/or hot weather conditions, reconstruct the 474 foot overrun at the Runway 18 threshold. This will include widening this surface to 75 feet as well as constructing a new 35 foot wide taxiway to access/egress the runway end. Additionally, these improvements will require the establishment of declared distances for Runway 18-36.

ALTERNATIVE DEVELOPMENT CONCEPTS

The alternative development concepts for HFJ resulted from examining the demand forecasts, as well as the facility needs required to accommodate projected aviation activity throughout the planning period. Additionally, goals

and objectives of the City pertaining to airfield and terminal area improvements, future land acquisition, runway expansion and the reconfiguration and expansion of the terminal area, were also considered.

The HFJ Planning Advisory Committee was presented with a total of eight alternative development options which included a 'no action' option; four options to expand the airfield portion of HFJ; and three options involving the expansion and reconfiguration of the terminal area complex.

The following discussion will highlight the development alternatives intended to meet the long-term aviation demand for HFJ and the City of Monett, as well as the southwest Missouri region.

'No Action' Alternative

The No Action alternative essentially involves maintaining the existing airport site in its current condition while not intending to and/or not providing for future developments based on projected demand at the facility. Obviously, this alternative would result in the inability of HFJ to provide enhanced levels of aviation safety and services to based aircraft owners and potential airport users throughout the 20-year planning period.

Since the early to mid 1990s, the tri-county region has experienced sustained population and socioeconomic growth, particularly per capita income and median household income. The demand forecasts for HFJ indicate this trend is likely to continue throughout the planning period. These positive trends are expected to further advance the overall service area of the Airport within southwest Missouri. Expansion of HFJ's service area is expected to provide aviation services to a broader percentage of the local area population which is anticipated to further increase the operational activity at the facility. Increased operational tempo is expected to further influence the future need for expanded airfield and terminal area facilities at HFJ.

Given its role within the Missouri state system of airports as a regional airport, the recommended improvements for HFJ will concentrate on expanding the runway and taxiway system as well as property acquisition. These improvements are intended to increase HFJ's level of safety, efficiency and operational capabilities for existing and future users. In addition to piston-powered aircraft, HFJ currently experiences literally thousands of multi-engine turbo-prop and business jet aircraft operations as well. Not only is this trend expected to continue, the operational activity by turbine powered airplanes is expected to increase at a steady pace throughout the planning period due to local and national business interests within the tri-county and southwest Missouri region. This increased demand will require the need to consider runway expansion to accommodate both projected leisure and business aircraft activity by piston, turbine and business jet airplanes.

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'No Action' Alternative

Given these reasons and a clear intent of the City to invest in expanding HFJ's airfield and terminal area, in addition to considering potential safety, operational, political and funding alternatives, the 'no action' alternative is not considered a reasonable and/or prudent alternative for Monett Municipal.

Expand Airport Site

The airport expansion alternatives are those that are viewed as the development options most viable to serve the future demand for services at HFJ.

In evaluating the feasibility of expanding HFJ, consideration of the airfield and terminal area and/or landside facility needs, as they pertain to accommodating project demand, are important in determining the need and practicality of expanding the Airport.

are intended to increase HFJ's level of safety, efficiency and operational capabilities for existing and future users. In addition to small piston-powered aircraft, HFJ also serves more sophisticated multi-engine turbo-prop and business jet aircraft as well. Not only is this trend expected to continue, the operational activity by turbine powered is expected to increase at a steady pace throughout the planning period. This increased demand will require the need to consider runway expansion to accommodate both projected leisure and business aircraft activity by piston and turbine airplanes.

Terminal area needs throughout the next 20 years are expected to include primarily additional hangar space, reconfigured aircraft apron space and tie-downs, and expansion of the terminal building to accommodate projected passenger activity. These improvements are based on projected demand which further shows a need to expand HFJ's terminal area to meet the needs of existing and future airport users.

Given these reasons and a clear intent of the City to invest in expanding HFJ's airfield and terminal area, in addition to considering potential safety, operational, political and funding alternatives, the 'no action' alternative is not considered a reasonable and/or prudent alternative for Monett Municipal.

Expand the Existing Airport Site

Expanding the existing airport involves investing in the current facility and expanding the airfield and terminal area to accommodate the projected 20-year operational and based aircraft demand discussed in Chapter 2.

The airport development alternatives evaluated by the Airport's Advisory Committee for further consideration present a broad range of expansion options and are discussed in the following passages. The airport expansion alternatives are those that are viewed as the development options most viable to serve the future demand for services at HFJ.

In evaluating the feasibility of expanding HFJ, several airfield and terminal area and/or landside considerations are important in determining the need and practicality of expanding the Airport.

Pertinent airfield considerations for HFJ include:

- Upgrading the ARC B-II planning standards for runway safety areas and taxiway dimensional requirements to ARC C-II
- Expanding Runway 18-36 to accommodate 100 percent of the general aviation aircraft fleet at 60 percent useful load for aircraft weighing up to and including 60,000 pounds
- Acquisition of land in fee simple and easements, including multiple residences, to the north, south and west of the Airport to allow for expansion of the runway and the weather reporting system

- Establishment of low-visibility, precision GPS instrument approach procedures to Runway 36
- Displacing the Runway 18 threshold in the interim (0-5 year period) to provide large aircraft longer takeoff runs during hot and/or wet weather conditions.

Pertinent terminal area/landside considerations for HFJ include:

- Development of additional T-hangar facilities
- Development of additional clear span hangar facilities
- Reconfiguration and expansion of the aircraft parking apron
- Relocation of the AWOS to the west side of the airfield
- Expansion of the existing terminal building

AIRFIELD EXPANSION ALTERNATIVES

The proposed development alternatives took into account each of the noted development considerations and were presented to the HFJ Advisory Committee for consideration. The following discussion highlights the critical elements of each of the airfield development alternatives as submitted to the committee.

Airfield Alternative 'A'

Alternative A included relocating Runway 18-36 400 feet to the west of the existing runway and developing a new 5,500' x 100' runway. The existing runway was depicted as serving as the future full-length parallel taxiway. In addition to 13 acres in easements, acquisition of nearly 242 acres in fee simple (including five residences) to the north, south and west of the Airport was also proposed as part of option A. This alternative was eliminated from further consideration by the City in favor of an option which would extend the runway to an ultimate length of 5,900 feet.

Airfield Alternative 'B'

Like option A, Alternative B included relocating Runway 18-36 400 feet to the west of the existing runway with the existing 18-36 serving as the ultimate parallel taxiway. However, Alternative B proposed a future runway length of 5,900 feet and required a total of 378 acres in fee simple acquisition in addition to another 12 acres in easements to accommodate the future relocated AWOS.

In comparison to Alternative D, as described below, which requires fewer acres to be acquired for future development, Alternative B was selected as the preferred alternative. This is due to the fact that as the new runway is being constructed 400 feet from the existing Runway 18-36, it will likely be possible to continue to use the current runway intermittently during construction decreasing the overall amount of time the Airport will be closed to operations. Alternative D, which proposes to relocate Runway 18-36 only 160 feet to the west, will require that the Airport be closed during the full duration of construction which could be

Airfield Alternative B

Alternative B includes relocating Runway 18-36 400 feet to the west of the existing runway with the existing 18-36 serving as the ultimate parallel taxiway. Alternative B also proposes a future runway length of 5,900 feet and required a total of 378 acres in fee simple acquisition in addition to another 12 acres in easements to accommodate the future relocated AWOS.

Alternative B was selected as the preferred long-term alternative to accommodate demand at HFJ throughout the planning period. Also, the relocation of the runway further to the west will allow the existing apron to be expanded and reconfigured to better serve small and large local and transient aircraft.

upwards of one year given the proximity of the current runway safety areas to the future runway under construction. Given these operational attributes, Alternative B was selected over Alternative D as the preferred alternative.

In addition to favorable operational capabilities, Alternative B was selected as the preferred alternative in that the relocation of the runway further to the west will allow the existing apron to be expanded and reconfigured to better serve small and large local and transient aircraft.

Airfield Alternative 'C'

Airfield Alternative C was an ambitious development option intended to avoid overflight of Pierce City, located approximately two miles north of HFJ, by realigning the future 5,900' x 100' runway 6.5 degrees to the west. To accommodate this proposed development, Alternative C involved acquisition of 360 acres, including easements, and the relocation of six residences. Alternative C was eliminated from further consideration by the City in favor of a development option that maintained the runway in a true north-south alignment and continued to utilize as much of the existing airfield pavement as possible.

Airfield Alternative 'D'

Alternative D involved relocating Runway 18-36 approximately 160 feet to the west of the existing runway while utilizing the existing taxiway to continue to serve Runway 18-36 throughout the planning period. Option D would require nearly 213 acres in fee simple acquisition as well as an additional 30 acres in easements for the future siting of the AWOS. Option D also involved acquisition of four residences to the north and south of HFJ. Alternative D was eliminated from further consideration by the City in favor of a development option that would allow the reconfiguration and expansion of the aircraft apron. Given the proximity of the taxiway and apron environment to the future runway Option D would not have been able to provide this apron expansion. Also, in implementing Alternative D, given its proposed alignment in reference to the taxiway and terminal area, the Airport would be effectively closed for approximately one year to allow for construction of the new runway. The City viewed this as an impractical operational and financial attribute which warranted elimination as a feasible development alternative for HFJ in favor of Alternative B.

Airfield Alternative 'E'

Airfield Alternative E involves reconstruction of the 474 foot overrun at the Runway 18 threshold and widening the surface to 75 feet to accommodate large cabin class aircraft departures to the south during wet and/or hot weather conditions. This alternative will result in the Runway 18 threshold being displaced by 474 feet as well as the runway being lengthened to 5,474' x 75'. Establishment of declared distances for the runway will be necessary in order to keep the Runway RPZ south of U.S. Highway 60 and eliminating the need for short-term property acquisition. Lastly, Alternative E includes the construction of a 35 foot wide taxiway to provide access/egress to and from the new Runway 18 threshold.

Airfield Alternative E

Airfield Alternative E involves reconstruction of the 474 foot overrun at the Runway 18 threshold and widening the surface to 75 feet to accommodate large cabin class aircraft departures to the south during wet and/or hot weather conditions. This alternative will result in the Runway 18 threshold being displaced by 474 feet as well as the runway being lengthened to 5,474' x 75'.

As a short-term solution to provide large aircraft additional runway length for takeoff, the city also chose Airfield Alternative E.

Citing various operational, social, environmental and financial considerations, the City and Planning Advisory Committee selected Airfield Alternative B as the preferred long-term development alternative to accommodate demand at HFJ throughout the planning period. As a short-term solution to provide large aircraft additional runway length for takeoff, the city and PAC also chose Airfield Alternative E. Accordingly, the following description provides an evaluation of pertinent elements associated with the implementation of these short and long-term development options.

Airfield Alternative 'B'

The proposed long-term airport expansion option and recommended ultimate airfield layout, designated **Exhibit 4.1- Preferred Airfield Alternative**, involves relocating and expanding the existing runway and taxiway system as well as significantly expanding the Airport's property interests.

The following items are attributes of HFJ's preferred airfield development alternative:

- Relocate Runway 18-36 approximately 400 feet to the west of the existing runway and construct a new 6,001' x 100' runway.
- The existing runway surface will serve as the future full-parallel taxiway. The ultimate parallel taxiway will be 35 feet in width and located 400 feet from the ultimate Runway 18-36 centerline.
- The future weight bearing capacity of the airfield paved surfaces is recommended to be 45,000 pounds for single wheel aircraft.
- Acquire approximately 378 acres in fee simple to the north, south and west of the Airport. This acquisition is expected to include relocation of six residences located to the north, south and immediately west of HFJ.
- Relocate the AWOS from the terminal area to a location situated west of the future runway in the vicinity of the Runway 36 threshold. This will require acquisition of 12 acres of easements to accommodate AWOS critical areas.
- Establish 50:1 GPS-based precision instrument approach procedure with minimum visibilities as low as ½-mile to the ultimate Runway 36 threshold. Maintain 34:1 GPS-based non-precision approach procedures with minimum visibilities not lower than 1-mile to the Runway 18 threshold.
- Expand the Runway 36 runway protection zone (RPZ) to accommodate future Category C and D aircraft with minimum visibilities down to ½-mile. Also, expand the Runway 18 RPZ to accommodate C/D aircraft with visibilities not less than 1-mile.

Additional Airfield Considerations

It should be noted that although the recommended ultimate runway length to accommodate projected demand is 5,900 feet, the City and Planning Advisory Committee elected to pursue the development of a 6,001 foot runway.



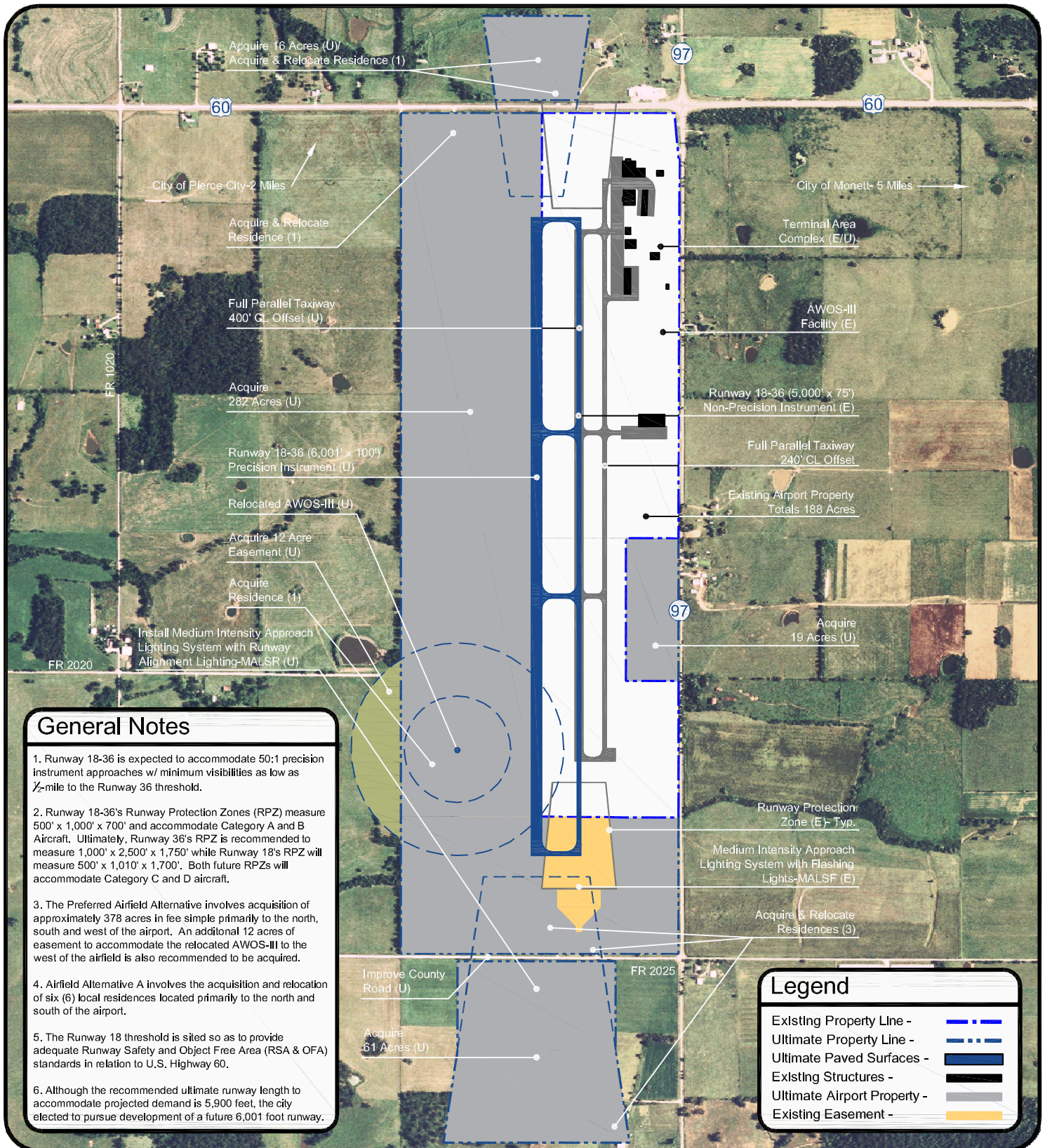
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MONETT MUNICIPAL AIRPORT (HFJ)

City of Monett, Missouri

Exhibit 4.1-Preferred Airfield Alternative Expand Runway 18-36 to 6,001' x 100' (ARC C-II)



Source: National Agricultural Imagery Program (NAIP), Barry County, MO.



City of Monett
Pride and Progress

Township 25N, Range 28W
Monett Township
Sections 5, 8 and 32
NOT TO SCALE



Airfield Alternative 'E'

The proposed short-term airport improvement option, designated **Exhibit 4.2-Interim Airfield Alternative**, involves displacing the Runway 18 threshold by 474 feet, widen and reconstruct the existing overrun to 75 feet and establish declared distances for 18-36.

The following items are attributes of HFJ's interim (0-5 year) airfield improvement alternative:

- Reconstruct the 474 foot Runway 18 overrun with concrete and widen the surface to 75 feet. Additionally, construct a 35 foot wide concrete taxiway to provide access between the new 18 threshold and the aircraft apron.
- Displace the Runway 18 threshold by 474 feet. This will include applying appropriate markings and installing lighting and signage.
- The runway safety area for the Runway 18 approach end will be extended 300' x 150' beyond the usable paved runway surface. The object free area (OFA) will also be extended 300' x 500' beyond the runway surface.
- Approach and departures operations to and from Runway 18 will involve establishment of declared distances.
- Approach and departures operations to and from Runway 36 will not involve the establishment of declared distances.

Additional Airfield Considerations

Airfield Alternative E was evaluated and considered due to the timeframe expected before construction of the future 6,001' x 100' is likely. This period of time could potentially take in upwards of 10 years. This is due to the environmental evaluation, land acquisition and engineering design processes that must be completed prior to implementation of the preferred airfield option. Also, Alternative E provides additional runway length for locally based jets and large, cabin class transient aircraft using the airfield now and into the mid-term (6-10 year) planning period.

TERMINAL AREA EXPANSION ALTERNATIVES

The proposed terminal area development options took into account each of the developmental considerations and presented to the HFJ Advisory Committee for consideration. The following discussion highlights the critical elements of the terminal area development option submitted to the committee.

Terminal Area Alternative 'A'

Alternative A considered the future siting of the Runway 18-36 and assumed that the location of the parallel taxiway serving 18-36 would remain in place. This influenced the future configuration of the terminal area in that the aircraft parking apron would be further extended to the south of the terminal complex. The new apron and tie-downs would be located



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MONETT MUNICIPAL AIRPORT (HFJ)

City of Monett, Missouri

Exhibit 4.2-Interim Airfield Alternative

Displace Runway 18 Threshold; Establish Declared Distances for 18-36

Legend

Existing Property Line -
Ultimate Paved Surfaces -
Existing Structures -

Retain Runway 18 RPZ (E)
500' x 1,000' x 700'
Category A & B Aircraft

Runway 18 End (Ph_1)
Elev. 1,315.1'-High Point

Retain Wind-T &
Wind Cone (E)

474' x 60' Blastpad/Stopway (E)
Reconstruct (PCC)/Mark/Light 474' x 75'-
Runway 18 Displaced Threshold

Abandon Taxiway (E)

Retain Threshold Lights
& REILs (E)

JKHY
Hangar B

EFCO

Construct (PCC)/Mark/Light
275' x 35' Taxiway

JKHY
Hangar A

City T-Hangar A

Terminal
Building (E/U)

City
Hangar B

Runway 18
Displaced Threshold (Ph_1)
Elev. 1,313.9'

Fuel
Farm (E/U)

City T-Hangar C

Retain
PAPI-4L (E)

AWOS-III (E)

General Notes

1. The Interim Airfield Alternative involves the reconstruction of the 474' x 60' Runway 18 blastpad/stopway. This improvement will allow the Runway 18 threshold to be displaced 474 feet. The displacement of the Runway 18 threshold will assist Category B & C business jet departures to the south by providing an additional 474 feet of runway length for takeoffs.
2. The proposed Runway 18 threshold improvements will involve the establishment of Declared Distances for approach and departures operations to and from Runway 18.
3. Approach and departures operations to and from Runway 36 will not involve the establishment of declared distances.
4. The runway safety area (RSA) for the Runway 18 approach end will be extended 300' x 150' beyond the usable paved runway surface. The object free area (OFA) will be extended 300' x 500' beyond the runway surface.

Declared Distances

Runway 18	
Takeoff Run Available (TORA).....	5,474'
Accelerate-Stop Distance Available (ASDA).....	5,474'
Landing Distance Available (LDA).....	5,000'
Takeoff Run Available (TORA).....	5,474'
Runway 36	
Takeoff Run Available (TORA).....	5,000'
Accelerate-Stop Distance Available (ASDA).....	5,000'
Landing Distance Available (LDA).....	5,000'
Takeoff Run Available (TORA).....	5,000'

Source: National Agricultural Imagery Program (NAIP), Barry County, MO.



approximately 625 feet south of the terminal building and would have consisted of approximately 7,000 square yards and 10 new tie-downs. Additional terminal area expansion included the development of four 10-unit T-hangar structures; relocation of the northern T-hangar to the south to allow for clear span hangar development; construction of six 5,000 square foot clear span hangars to the immediate east of Jack Henry's facilities; and expansion of the Golden Aviation apron and hangar facilities to the south of the terminal area. Alternative A was eliminated from further consideration by the City in favor of an option which allowed for apron expansion and reconfiguration located in closer proximity to the terminal building.

Terminal Area Alternative 'B'

Alternative B also considered the future siting of the Runway 18-36 and assumed that it would be relocated 400 feet to the west of the current runway. The relocation of 18-36 further to the west also allowed the existing runway surface to serve as the future parallel taxiway for 18-36. This, in turn, accommodated expansion and reconfiguration of the current apron to 20,300 square yards in its current location and in close proximity to the core terminal area and terminal building. T-hangar and clear span hangar development was similar to that of terminal option A. Terminal Alternative B was eliminated from further consideration by the City in favor of an option depicting a smaller and more efficient apron and tie-down layout.

Terminal Area Alternative 'C'

Terminal Alternative C, like option B, also considers the future siting of the Runway 18-36 to the west and utilization of the current runway to serve as a future parallel taxiway. Alternative C proposes a refined apron and tie-down layout which would require approximately 22,000 square yards of apron to be developed. Additionally, the northern hangar development area exhibits a mix of T-hangars and three new clear span hangars. Hangar development to the south of the terminal complex includes 40 nested T-hangar units as well as three additional clear span hangars.

Citing operational, financial and spatial considerations, the City and Planning Advisory Committee selected Terminal Area Alternative C as the preferred development alternative to accommodate ultimate terminal/landside demand at HFJ. The following description provides a summary of the elements associated with the implementation of this terminal area development option.

Terminal Area Alternative 'C'

The proposed landside expansion option and recommended ultimate terminal area layout, designated **Exhibit 4.3- Preferred Terminal Area Alternative**, involves expanding hangar facilities to the north and south of the existing terminal area complex as well as apron expansion to the immediate west of the terminal building.

The following items are attributes of the HFJ preferred terminal area development alternative:

Terminal Alternative C

Alternative C considers the future siting of the Runway 18-36 to the west and utilization of the current runway to serve as a future parallel taxiway. Alternative C also proposes a refined apron and tie-down layout which would require approximately 22,000 square yards of apron to be developed.

The City and Planning Advisory Committee selected Terminal Area Alternative C as the preferred development alternative to accommodate ultimate terminal/landside demand at HFJ.



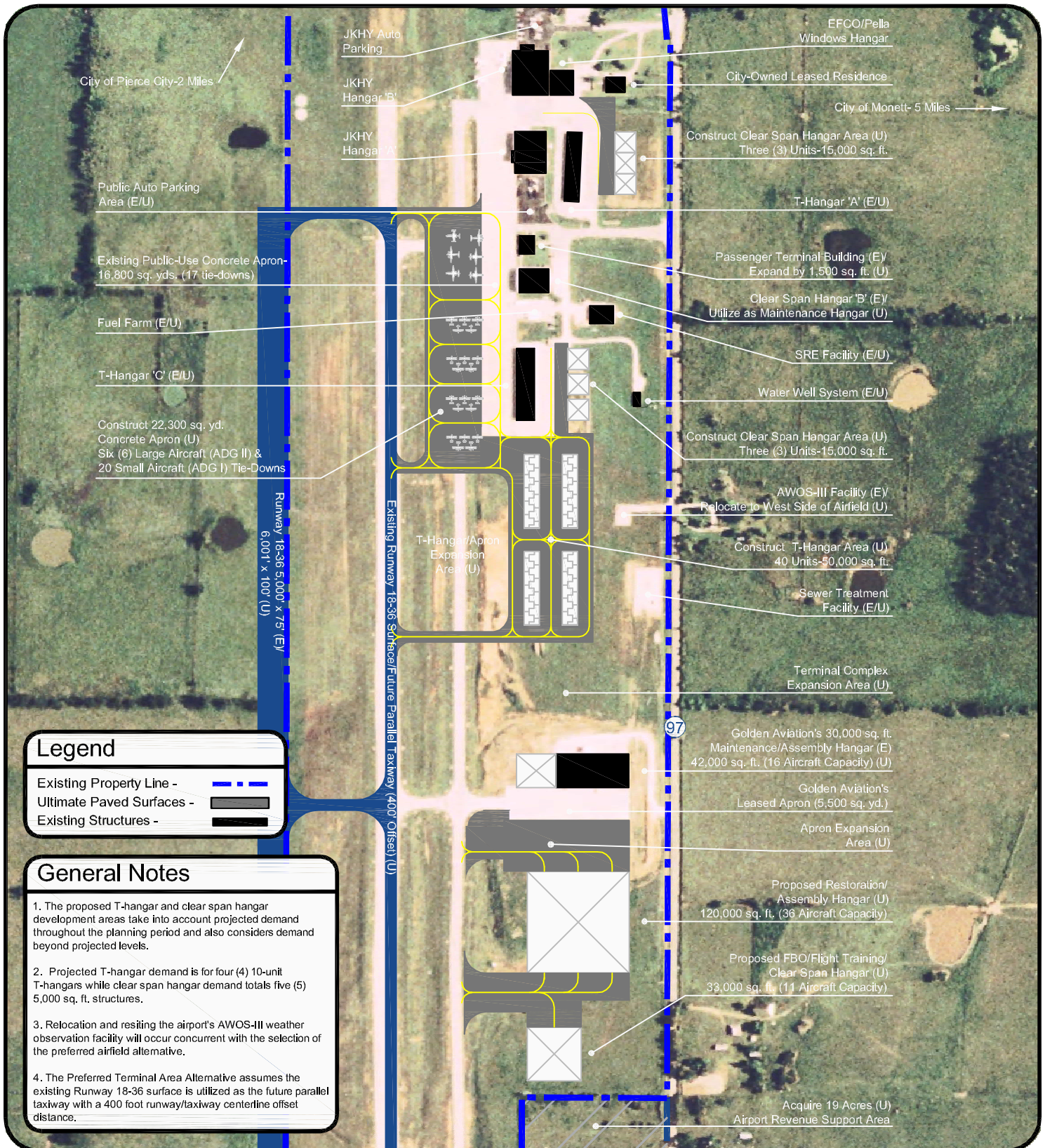
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MONETT MUNICIPAL AIRPORT (HFJ)

City of Monett, Missouri

Exhibit 4.3-Preferred Terminal Area Alternative Expansion Assumes Rwy 18-36 is Utilized as Future Parallel Taxiway



Source: National Agricultural Imagery Program (NAIP), Barry County, MO.

