



5

AIRPORT ALTERNATIVES ANALYSIS

EVALUATION ANALYSIS

This chapter describes various airfield and terminal area alternatives for implementation of the facility design recommendations stated in the previous chapter. The focus of this section is to evaluate the merits and deficiencies of alternatives, and provide the technical basis necessary for determining a *preferred* airport development plan. The preferred plan will be depicted in the Airport Layout Plan (ALP) set of drawings.

Overall, the airport plan is the formulation of a development concept, rather than the presentation of a design recommendation. While the assessment of alternatives is based on technical, economical, and practical judgment, the most favorable airport improvement option should be compatible with local planning initiatives, as consistent with social, economic, political and environmental goals of the Port, as well as the county. In order to determine the best possible course of action, the following factors should be considered in the development and evaluation of potential design options at JCIA.

- *Compliance with FAA airport design standards and airspace criteria without modification to airport planning design standards;*
- *Maintain compatibility with existing and proposed on and off-airport land uses and zoning ordinances;*
- *Consideration of short and long-term development costs;*
- *Minimize the consequences of environmental impacts and provide for potential mitigation to any significant environmental impact.*

AIRFIELD ALTERNATIVES

The alternatives that follow have been assembled to provide the Port with the full range of design options and are based on the unconstrained development of the JCIA. They are based on the demand forecasts and potential expanded usage of the airport. The major airfield design and expansion options for JCIA include the following alternatives:



- ➔ **ALTERNATIVE A – Extend Runway 9 by 425’ and Runway 27 by 75’ (ARC B-II) and Realign/Reconstruct Taxiway A**
- ➔ **ALTERNATIVE B – Extend Runway 9 by 200’ (3,200’ x 75’) and Establish Non-Precision Instrument (NPI) Approach Procedures**
- ➔ **ALTERNATIVE C – Status Quo Option - Airport Remains an ARC B-I Facility**

ALTERNATIVE A – Extend Runway 9 by 425’ and Runway 27 by 75’ (ARC B-II) and Realign/Reconstruct Taxiway A

As determined by the aviation demand forecasts for JCIA, it is anticipated that aviation activity by ARC B-II aircraft (King Air C90B) at the conclusion of the 20-year planning period will rise above the recommended activity threshold (500 annual operations) necessitating consideration of expanding Runway 9-27 to safely and efficiently accommodate the aircraft. Alternative A proposes extensions to both the Runway 9 (425’) and Runway 27 (75’) thresholds to minimize potential property acquisition and roadway realignment. It should be noted that this option is not a design “requirement;” but, based on reasonable expectations of airport usage, the Port should be aware of this potential need and be prepared to make an informed decision about this option.

Design Considerations:

- Extend the Runway 9 threshold 425’ to the west, while at the same time extend the Runway 27 threshold 75’ to the east, bringing the runway dimensions to 3,500’ X 75’ (ARC B-II). This option includes extending the Medium Intensity Runway Lighting (MIRL) an additional 500’ as well and remarking the runway for Basic Visual Approach activity.
- Extend Taxiway A an additional 425’ to the west, as well as 75’ to the east while widening the entire length of the taxiway to 35’ to adhere to ARB B-II design criteria. In addition, this option requires realignment of Taxiway A so that there is 240’ centerline separation between the runway and taxiway.
- In order for the existing site to accommodate the future Runway 9 OFA, State Highway 20 will require realignment. The depicted location of the realignment of Highway 20 is based on the necessary offset from the runway end in order to provide the adequate minimum adjusted clearance of 17’ over the roadway surface.
- Initial analysis appears to indicate that property acquisition, if necessary, will not be significant in the affected area of the Runway 9 extension.



ALTERNATIVE B – Extend Runway 9 by 200' (3,200' x 75'- ARC B-I) and Establish Non-Precision Instrument (NPI) Approach Procedures

Alternative B proposes a 200' extension to the Runway 9 threshold to accommodate future non-precision instrument approach capabilities as recommended by design criteria. The extension to the Runway 9 threshold is consistent with prevailing wind patterns in the area, as well as having minimal affect on wetlands areas on airport property.

- Extend the Runway 9 threshold 200' to the west, bringing the runway dimensions to 3,200' X 75' (ARC B-I). This option includes extending the MIRL an additional 200' as well and remarking the runway for NPI approach activity.
- Extend Taxiway A an additional 200' to the west while retaining the width of 25' the entire length of the taxiway to adhere to ARB B-I design criteria. In addition, this option requires maintaining the alignment of Taxiway A so that there is 225' centerline separation between the runway and taxiway. Lastly, removal of the reflective markers installation of Medium Intensity Taxiway Lighting (MITL) along the entire length of Taxiway A (3,200') is recommended.

ALTERNATIVE C – Status Quo Option - Airport Remain an ARC B-I Facility

Should the Port decide that extending the Runway to accommodate potential future aviation demand is not feasible, this alternative proposes that no changes be made to the airside/airfield geometric design. Runway 9-27 would remain at its current dimension of 3,000' x 75' throughout the planning period and Taxiway A would not require realignment or reconstruction.

TERMINAL AREA ALTERNATIVES

The major terminal area design and expansion options for JCIA include the following alternatives:

➔ ALTERNATIVE A – EASTERN TERMINAL AREA DEVELOPMENT INCLUDING COMMERCIAL/INDUSTRIAL DEVELOPMENT (SOUTH)

This alternative is viewed as the preferred alternative accommodating anticipated aviation demand while at the same time minimizing impacts to local wetlands areas. Terminal area Alternative A involves developing additional hangar space to JCIA's ever growing demand for hangar storage area, as well as construction of terminal building facilities to host specific public amenities. This alternative proposes clear span/common hangar development to the immediate north of eastern tie-down area extension. In addition, maintenance/aerospace museum facilities and accompanying automobile parking area are proposed to be located northeast of the eastern tie-down extension.



The airport terminal building would function in a dual role for scheduled commercial service and general aviation passenger use, and the proposed location would be ideally placed at the central portion of the main airport tie-down apron. This would provide ease of access, as well as improved line-of-sight and airfield visibility.

With regard to T-hangar development, the ideal location for this development would be to the east of the main airport apron area to include the property south and east of the eastern tie-down extension adjacent to Taxiway 'B.' To fulfill the demand for T-hangar space in the future, six T-hangars totaling 75,000 square feet of space would be needed. The additional four clear span/common hangars are to provide approximately 20,000 square feet of hangar space for additional single-engine and twin-engine based aircraft.

Next, a 25' wide taxiway would be constructed to provide direct access between the existing western terminal area development and the future eastern hangar development area. The proposed taxiway would be sited approximately 690' laterally from the runway centerline and link Taxiways B and C to further provide additional aircraft maneuvering and circulation capabilities.

Finally, a western airport paved access road is to be located to the northwest of the main terminal area complex adjacent to Highway 20. In addition, consideration should also be given to the development and planning for a future commercial/industrial development area located within the southern-most portion of the airport property being situated adjacent to Four Corners Road.

→ **ALTERNATIVE B – EASTERN AND SOUTHERN TERMINAL AREA DEVELOPMENT INCLUDING COMMERCIAL/INDUSTRIAL DEVELOPMENT (SOUTH)**

This alternative assumes that based aircraft growth at JCIA will surpass anticipated activity levels with as many as 250 based aircraft. This alternative depicts additional hangar development to the south of Runway 9-27, as well as airport access from the south originating from Four Corners Road in order to avoid development to the east affecting wetlands areas.

The southern terminal/hangar area depicts the most likely location for siting additional T-hangar and clear span hangars, as well as accompanying taxilanes and automobile parking area, due to the abundance of designated wetlands located to the east of the existing terminal area complex. However, the terrain relief within the southern airport property boundary increases sharply and would require extensive earthwork and excavation and is likely cost-prohibitive from an economic and planning standpoint.



The cost associated with excavation and earthwork of developing the southern terminal/hangar area versus the cost of mitigating wetlands to the east of the terminal area complex to accommodate additional hangar space beyond that required for future facility need and demand is a primary concern for the Port when considering Alternative B.

→ **ALTERNATIVE C – EASTERN AND SOUTHERN TERMINAL AREA DEVELOPMENT INCLUDING COMMERCIAL/INDUSTRIAL DEVELOPMENT (MAXIMUM UTILIZATION FOR AIRPORT RELATED DEVELOPMENT)**

Alternative C merely depicts development of additional T-hangars within the eastern terminal area expansion to accommodate approximately 75 to 100 additional based aircraft. This growth assumes that additional hangar development to the south of the airport property boundary is either not possible or undesirable. In addition, this option is intended to illustrate the likely location for numerous hangars reflecting aggressive hangar development and based aircraft growth.

Finally, Alternative C involves substantial wetlands impacts primarily located within the eastern airport property boundary. This alternative is considered to be a last resort from an environmental standpoint due to the adverse environmental impact on the designated wetlands. As with Alternative B, the environmental and financial cost associated with mitigating wetlands for this option is a critical decision for the Port and should be given due consideration.

→ **ALTERNATIVE D – EASTERN AND SOUTHERN TERMINAL AREA DEVELOPMENT INCLUDING COMMERCIAL/INDUSTRIAL DEVELOPMENT (MAXIMUM UTILIZATION FOR AIRPORT AND INDUSTRIAL/COMMERCIAL RELATED DEVELOPMENT)**

Alternative D involves development of additional industrial area within airport property. This additional development likely could occur to the south of Runway 9-27 as an extension of the development proposed with Alternative A. This option is intended to depict potential airside/airfield access for tenants of this industrial development. Additionally, industrial development is proposed to the north and east of Runway 9-27 which abuts Highway 19, allowing maximum utilization for airport and industrial related on-airport development.

Finally, Alternative D involves substantial wetlands impacts primarily located within the eastern airport property boundary. As with Alternative C, the environmental and financial cost associated with mitigating wetlands for this option is a critical decision for the Port and should be given due consideration.



SUMMARY OF AIRFIELD/TERMINAL AREA ALTERNATIVES

Various airfield design options have been prepared for Jefferson County International Airport to satisfy the objectives of Alternatives A through D. These design concepts represent the range of possibilities to reasonably improve certain design and operational characteristics at the airport. Following a review of these geometric alternatives and based on the merits of meeting the performance standards of future airport operational activity (individual or combination of strategies), a preferred airfield alternative design concept will be selected and will be carried through the remainder of the study ultimately used to update the JCIA Layout Plan.

ALTERNATIVE A AND B - RUNWAY 9-27 EXTENSION OPTIONS

Exhibit 5.1: Airfield Alternative 'A'

Exhibit 5.2: Airfield Alternative 'B'

ALTERNATIVE C - STATUS QUO OPTION

Exhibit 5.3: Airfield Alternative 'C'

TERMINAL AREA ALTERNATIVE A – EASTERN TERMINAL AREA DEVELOPMENT INCLUDING COMMERCIAL/INDUSTRIAL DEVELOPMENT

Exhibit 5.4: Terminal Area Alternative 'A'

TERMINAL AREA ALTERNATIVE B AND C – EASTERN AND SOUTHERN TERMINAL AREA DEVELOPMENT INCLUDING COMMERCIAL/INDUSTRIAL DEVELOPMENT

Exhibit 5.5: Terminal Area Alternative 'B'

Exhibit 5.6: Terminal Area Alternative 'C'

TERMINAL AREA ALTERNATIVE D – EASTERN/SOUTHERN TERMINAL AREA DEVELOPMENT INCLUDING COMMERCIAL/INDUSTRIAL DEVELOPMENT - MAXIMUM UTILIZATION

Exhibit 5.7: Terminal Area Alternative 'D'

PREFERRED AIRPORT ALTERNATIVE – TERMINAL AREA ALTERNATIVE ASSUMING UNCONSTRAINED BASED AIRCRAFT GROWTH EQUALING APPROXIMATELY 250 AIRCRAFT

Exhibit 5.8: Preferred Airport Alternative