CHAPTER 3: ALTERNATIVES ANALYSIS

Introduction

This chapter of this Supplemental Airport Plan discusses airport development alternatives to accommodate the long-term development needs for Terry Airport (8U6). The objective of this chapter is to clearly document the recommended airport development that meets the needs of airport users, City of Terry, Prairie County and surrounding neighbors.

Alternatives evaluated for this study are based on comparing existing conditions with facility requirements reviewed in detail in the previous chapters. Potential impacts of each alternative considered are discussed and used to help the airport select a preferred alternative(s) to be shown on the Airport Layout Plan.

A Preferred Development Strategy based on the selected alternative(s) is summarized after the analysis. This preliminary plan provides a guideline for implementation based on identified needs and priorities. The recommended plan to implement the proposed development is outlined in **Chapter 4: Implementation**.

Evaluation Process

The alternatives evaluation process is the most collaborative portion of the planning study. The alternatives were reviewed and refined through meetings with agency representatives and the study's advisory group. Evaluation used to compare the alternatives. The alternative evaluation criteria utilized for this study is as follows:

Operational Performance - How does each alternative allow the airport to operate as a functional system, meet design standards, and meet the needs of the community.

Best Planning Tenets – What are the strengths and weaknesses of the alternatives as it relates to 1) flexibility to meet demand and react to unforeseen changes; 2) highest and best on- and off-airport land use; 3) feasibility to implement politically and within practical phases; and 4) ability to satisfy airport user needs.

Environmental Factors – What are the potential effects of the alternatives upon the natural and built environment.

Fiscal Factors – How much will the options cost as compared to each other, while making the most use of federal, state and local resources.

Needs Summary

The airfield is vital to the airport's core infrastructure for accommodating aircraft operations. The following section summarizes key airfield facility requirement findings:

Runway 8/26**:** 75' x 4,300' for ARC B-II (small) aircraft with 1-mile instrument approach
Other**:** 10' Wildlife fence around the airport per the Wildlife Hazard Management Plan

Development Alternatives

North Wildlife Fence and Irrigation Ditch

The 10 foot wildlife fence will need to constructed at least 320' from the centerline of the runway. The edge of the irrigation ditch on the north side of the airport is currently between 240' and 550' from the centerline of the runway so all of the irrigation ditch is not required to be relocated. Several alternatives will be examined including an alternative that realigns the entire ditch allowing use of an uneconomic remnant of land and removing a bridge that must be maintained to access this property. During the project an effort was also coordinated with the Buffalo Rapids Irrigation District No. 2 to determine their position on the alternatives. See **Figure 3-1 North Wildlife Fence and Irrigation Ditch Alternatives**.

No Change: The irrigation ditch will remain in its current location and the wildlife fence will be constructed along the north side of the runway 330' from the centerline Runway length except near the ditch portion at 240' from the centerline.

Advantages:

- No capital costs except for fence and small portion of land (5.8 acres north portion)
- No cost to relocate/realign the ditch
- Meets current FAR Part 77 surface requirements for visual approaches

Disadvantages:

- Does not meet future FAR Part 77 surface requirements for instrument approaches. Fence penetrates the primary surface and transitional surface each by as much as a 10'

Alternative 1 – Wildlife Fence with Ditch Crossing: The wildlife fence is constructed 330' north of the centerline of the runway for the full length except for approximately 650' of fence that must cross the irrigation ditch to the north then re-cross the ditch back to the south. The bridge remains to access the uneconomic remnant of property.

Advantages:

- No cost to relocate/realign the ditch.
- Meets future FAR Part 77 surface requirements for instrument approaches

Disadvantages:

- Need to maintain two fence crossings of the ditch from access by wildlife
- Most Land Acquisition (6.4 acres north portion)
- Uneconomic remnant of property is 4.4 acres with small bridge to access
- Irrigation District will not accept a fence across the ditch

Alternative 2 – Wildlife Fence with Short Ditch Realignment: The wildlife fence is constructed along the north side of the runway for the full length 330' from the runway centerline. A 680' portion of the irrigation ditch is realigned but the bridge remains across the ditch to access the uneconomic remnant of property.

Advantages:

- Minimal Land Acquisition (5.7 acres north portion)
- Meets future FAR Part 77 surface requirements for instrument approaches
- No fence ditch crossings to maintain
- The Irrigation District prefers this Alternative

Disadvantages:

- Cost to realign 680' of irrigation ditch
- Uneconomic remnant of property is 4.4 acres with small bridge to access

Alternative 3 – Wildlife Fence with Long Ditch Realignment: The wildlife fence is constructed along the north side of the runway for the full length, 330' from the runway centerline. The irrigation ditch is realigned for 2,400' and the bridge is removed. The uneconomic remnant of property is joined together for the property owner to the north.

Advantages:

- Meets future FAR Part 77 surface requirements for instrument approaches
- No fence ditch crossings to maintain
- Minimal Land Acquisition (5.7 acres north portion)
- No bridge to remain and 5.9 acres are added to north property owner
- The Irrigation District has not dismissed this Alternative, but prefers Alternative 2 since it is less disruptive than Alternative 3

Disadvantages:

- Cost to realign entire irrigation ditch which is 2,400'

Figure 3-1 – North Wildlife Fence and Irrigation Ditch Alternatives

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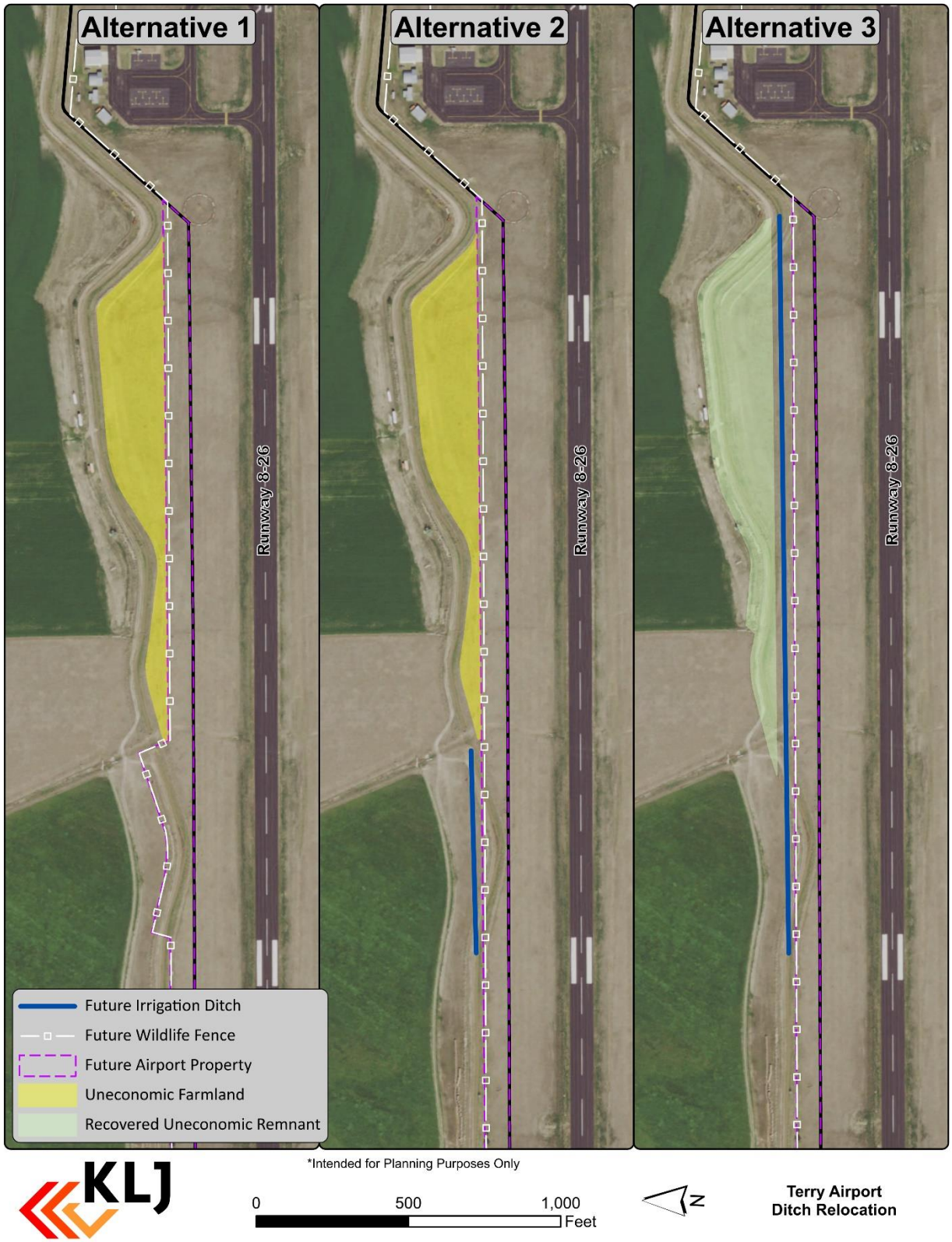

Table 3-1 – North Wildlife Fence and Irrigation Ditch Alternatives Summary

Factor	No Change	1	2	3
Proposed Action	Wildlife Fence Installed at existing property line	Wildlife Fence at 330' with 2 ditch crossings	Wildlife Fence at 330' with shortest ditch realignment	Wildlife Fence at 330' with longest ditch realignment
Part 77 Obstruction (Existing)	No	No	No	No
Part 77 Obstruction (Future)	Yes	No	No	No
Ditch Realignment	none	None Not accepted by Irrigation District	680' Preferred by Irrigation District	2,400'
Land Acquisition*	none	6.4 acres	5.7 acres	5.7 acres
Uneconomic Remnant	7.8 acres	4.4 acres	4.4 acres	0 acres

*Source: KLJ Analysis; * There is an additional 18.3 acres to be acquired south of the airport and an undetermined acreage west of the airport which are not included with this land acquisition that is north of the airport.*

Preferred Alternative – Following a review of the alternatives, completion of the wetlands inventory and cultural inventory and feedback from the Buffalo Rapids Irrigation District No. 2, the preferred alternative for the ditch realignment was Alternative 2.

West Wildlife Fence and Residence Road

The wildlife fence when constructed will be 10 feet tall and will need to be located further west than the current barbed wire fence so that the fence does not penetrate the future Part 77 Approach Surface or Paragraph 3.6 Approach Surface for Runway 8. **Table 3-2 Approach Surfaces Impact** provides a summary that is explained later regarding the alternatives. The calculations for the residential road are based on a 10-foot vehicle which is the FAA standard for a private road.

Interstate Right of Way Fence – The fence along I-94 is currently 40 feet from the south drive lane running parallel to the existing residential road. The fence is then 60 feet from the south drive lane leaving less room currently for extending the residential road. There may be issues with trying to reduce the interstate right of way but those issues can be resolved in the project design for the road and fence.

Survey Data – It is important to point out that at the time the previous ALP was prepared, there was not an aeronautical survey completed. The land area is generally flat but the topography to the west of the Runway 8 approach was not surveyed. Therefore, the elevation of objects as compared to the approach surface is expected to vary by 1 to 2 feet and a penetration of about 1 foot should be able to be mitigated in the project design for the road and fence.

Table 3-2 – Approach Surfaces Impact

Alternative	No Change	1	2	3
Part 77 (20:1) 500' x 2,000' x 5,000'				
Wildlife Fence	10' to 5'	1' to (47')	1' to (10')	(13' to 50')
Road	1' to (5')	(1' to 49')	(1' to 12')	-
Paragraph 3.6 (20:1) 400' x 3,400' x 10,000'				
Wildlife Fence	5'	(2' to 44')	(2' to 10')	(16' to 52')
Road	(1' to 5')	(4' to 47')	(4' to 12')	-

*Source: KLJ Analysis Notes: **Red** is Above Surface, **(Negative Number)** is Below Surface*

No Change: The current fence location remains the same and the existing barbed wire fence is replaced with a 10-foot tall wildlife fence.

Advantages:

- No cost for additional land
- No cost to relocate residential road
- Road will be 1 foot above to 5 feet below the Part 77 approach surface
- Road will be 1 to 5 feet below the Paragraph 3.6 Approach Surface

Disadvantages:

- Wildlife fence would penetrate the Part 77 Approach Surface by 5 to 10 feet
- Wildlife fence would penetrate the Paragraph 3.6 Approach Surface by 5 feet
- Road will remain inside the RPZ

Alternative 1 – Wildlife Fence parallel to I-94 and Road around Fence: The wildlife fence would be constructed to the west and parallel to I-94 but leaving room for a road. The residential road would be constructed by extending the existing road west along the Interstate until reaching the end of the fence. The road would then turn directly south until intersecting the N-S section line, then east to connect to the existing residential road. Road Construction would be 3,100 linear feet. See **Figure 3-2 Wildlife Fence and Residential Road Alternatives** for all three alternatives.

Advantages:

- Wildlife fence would be 1 foot above to 47 feet below the Part 77 Approach Surface
- Wildlife fence would be 2 to 44 feet below the Paragraph 3.6 Approach Surface
- Road would be 1 to 49 feet below the Part 77 Approach Surface
- Road would be 4 to 47 feet below the Paragraph 3.6 Approach Surface

Disadvantages:

- Road will remain inside the RPZ

Alternative 2 – Wildlife Fence minimal to west and Road minimal to west: The wildlife fence would be constructed to the west only as far as necessary to keep the fence and road clear of the Part 77 and Paragraph 3.6 Approach Surfaces. Road Construction would be 1,300 linear feet.

Advantages:

- Wildlife fence would be 1 foot above to 10 feet below the Part 77 Approach Surface
- Wildlife fence would be 2 to 10 feet below the Paragraph 3.6 Approach Surface
- Road would be 1 to 12 feet below the Part 77 Approach Surface
- Road would be 4 to 12 feet below the Paragraph 3.6 Approach Surface
- Least amount of road construction of any alternative

Disadvantages:

- Road will remain inside the RPZ

Alternative 3 – Wildlife Fence furthest west with Road on E-W Section Line: The wildlife fence would be constructed along the I-94 right of way which is the furthest to the west possible. The road would be relocated along the E-W section line right of way south of the airport. Road construction would be 5,100 linear feet.

Advantages:

- Wildlife fence will be 13 to 50 feet below the Part 77 Approach Surface
- Wildlife fence will be 16 to 52 feet below the Paragraph 3.6 Approach Surface
- Road will be outside the RPZ

Disadvantages:

- Requires the largest amount of road construction of any alternative

Figure 3-2 – Wildlife Fence and Residential Road Alternatives

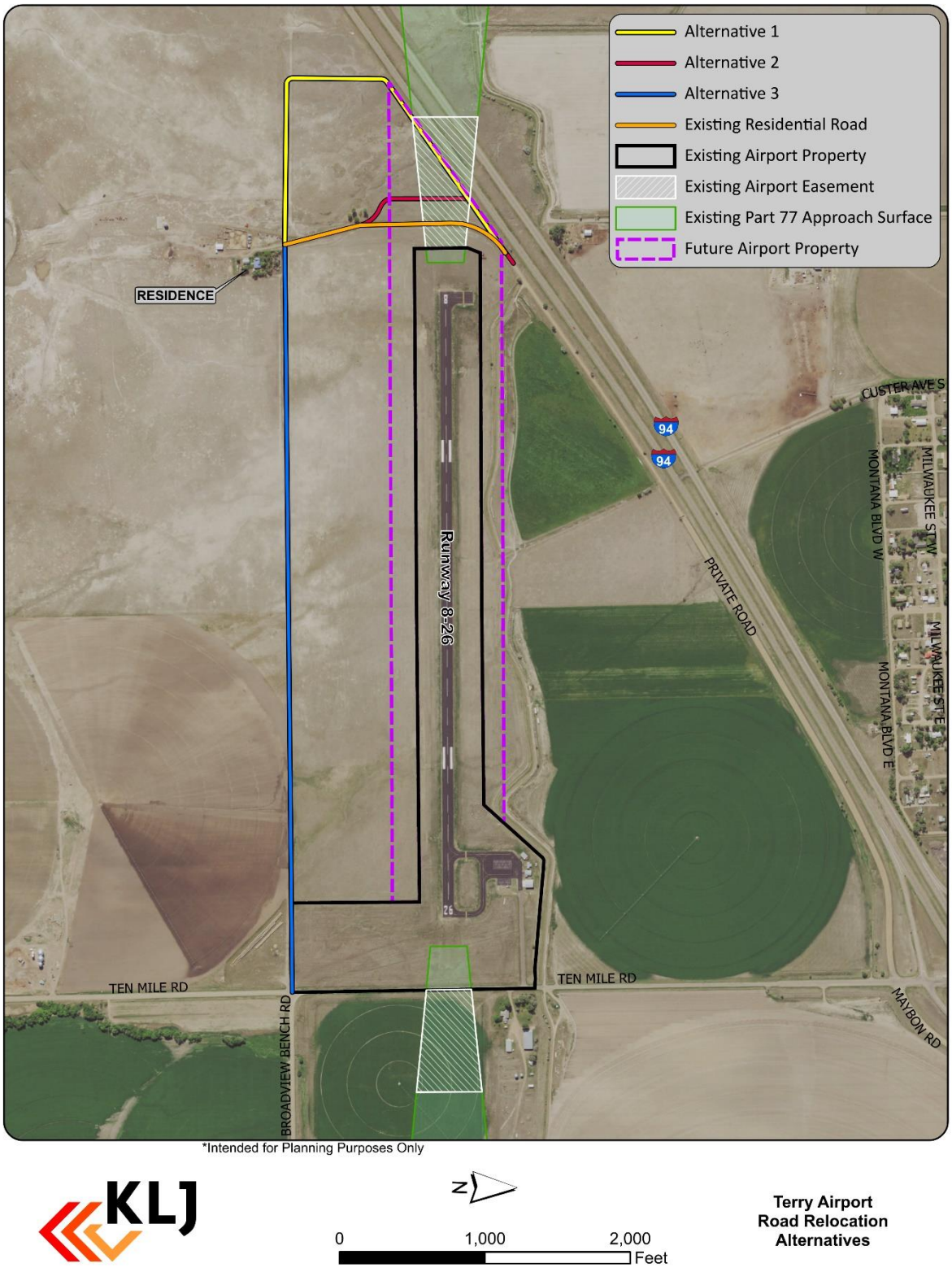

Table 3-3 – Road Location Alternatives Summary

Factor	No Change	1	2	3
Proposed Action	Wildlife Fence Constructed at Existing Location	Relocate the existing road west along the I-94 right of way	Relocate the existing road west around the furthest distance needed for the Wildlife Fence	New Road along Section Line south of the Airport
Part 77 Obstruction (Existing)	Yes	Minimal 1'	Minimal 1'	No
Part 77 Obstruction (Future)	Yes	No	No	No
Road Length	none	3,100'	1,300'	5,100'
Land Acquisition*	0	12.9 acres	6.9 acres	12.9 acres

*Source: KLJ Analysis; * There is an additional 18.3 acres to be acquired south of the airport and an undetermined acreage of land north of the airport which are not included with this land acquisition that is west of the airport.*

Preferred Alternative - Following a review of the alternatives, completion of the wetlands inventory and cultural inventory, the preferred alternative for the road realignment was Alternative 2.

Preferred Development Strategy

The preferred development strategy identified in **Table 3-4** below outlines the overall development sequence for the preferred alternatives based on airport sponsor priorities. These elements are shown graphically in **Figure 3-3.** The implementation plan in **Chapter 4** will identify a realistic project sequencing based on available funding.

Table 3-4 – Preferred Development Strategy

	Near-Term 0-5 Years PAL 1	Mid-Term 6-10 Years PAL 2	Long-Term 11-20 Years PAL 3 & 4
Runway 8-26	• Pavement Maintenance • Aeronautical Survey for Approaches	• Pavement Maintenance	• Pavement Maintenance
Terminal & Hangar	• AWOS-III	• Terminal • Hangars on Demand	• Hangars on Demand
Support & Other	• Land Acquisition for Fencing and Instrument Approach • Relocate Irrigation Ditch • Relocate Residential Road • Wildlife Fence	•	• Replace SRE

Source: KLJ Analysis

NOTE: Scope and timing of airport improvements depends on available funding and demand thresholds being met.

Figure 3-3 – Preferred Development