Appendix C: Meetings & Public Involvement

Introduction

The Warroad International Memorial Airport (RRT) understands the importance of public involvement in the Master Plan Update process. During the scoping meeting, the Airport and KLJ designed a transparent process that allows opportunities for stakeholders to be actively engaged. The Airport also believes that members of the public should have an opportunity to comment on decisions about actions that could affect their lives. This involvement took place in the form of public open houses, website information sessions, and stakeholder outreach efforts. The Airport appreciates that public participation improves the decision-making process by recognizing and communicating the needs and interests of all participants. As a result of the public participation process, we feel that the airport master plan offers a valuable path for developing the Warroad International Memorial Airport.

Stakeholders

As part of the planning process the following groups/people were contacted for their insight into the Warroad International Memorial Airport:

1. Airport/Sponsor Staff
    a. Matt Rachuy – Airport Manager
    b. Dave Paulson – Airport Commission
    c. Adam Erdmann – Airport Commission / Marvin Windows (Pilot)
2. Local Government
    a. Tom Goldsmith – City Council / Marvin Windows
3. Airport Users
    a. Bill Yon – Marvin Windows
    b. Jared Olafson – US Customs & Border Protection
    c. Dan Olds – MN DNR

Key Issues/Public Involvement Goals

This planning effort covered typical aspects of airport master plans from reviewing existing conditions to forecasts to alternative development but also focused on key issues which we learned from our scoping meeting. These issues were as follows:

1. Evaluate the parallel taxiway separation and location of connector taxiways to Runway 13-31
2. Evaluate apron layout to meet maneuvering standards and aircraft parking needs
3. Evaluate future hangar area development layout
4. Evaluate and determine future location for Automated Weather Observation System (AWOS)

From the scope meeting it was determined that documentation of existing conditions, forecasting future aviation activity levels, identifying future facility requirements, formulating and evaluating alternatives,

preparing implementation plans and engaging the public and other government agencies were main goals for the future of RRT.

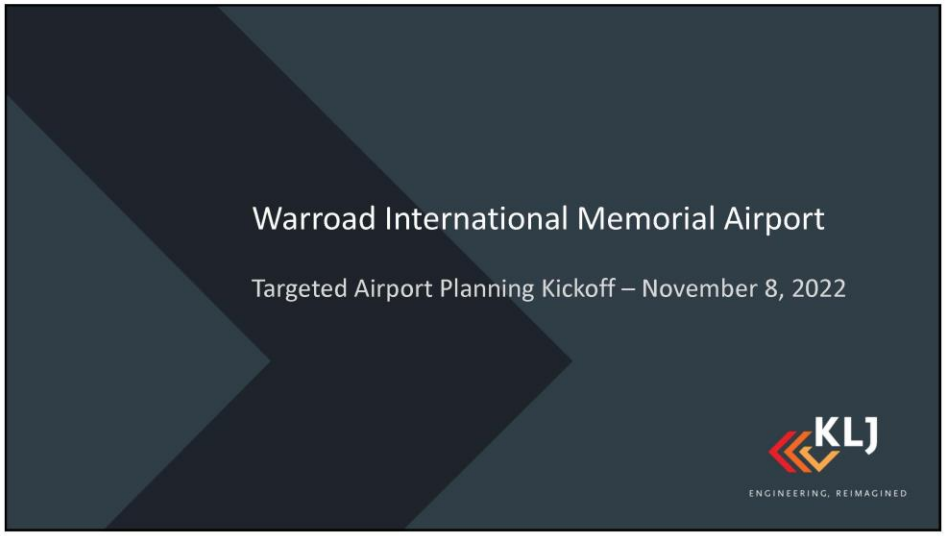
The following table specifies the type of public outreach achieved along with a location of specific meeting materials located in this appendix.

Table C-1 – Public Outreach Activities

Date of Outreach	Type of Public Process	Attendance	Information Conveyed	Page in Appendix
11/8/2022	Planning Study Kickoff	10	Roles, planning, existing conditions, public involvement	C-3
4/10/2023	Targeted Planning Study Meeting #2	10	AWOS siting, wind analysis, critical design aircraft, taxiway separation	C-13
9/12/2023	Targeted Planning Study Meeting #3 (Microsoft Teams)	8	Existing Conditions, forecast, facility requirements, runway alternatives	C-24
10/10/2023	Targeted Planning Study Meeting #4	7	Update on AWOS siting, Terminal & apron alternatives and input	C-33
10/10/2023	Public Open House	1	Review refined alternatives and input	C-47
4/30/2024	Agency Meeting	12	Review alternatives, implementation and agency feedback	C-53

Source: KLJ

Planning Study Kickoff Meeting – November 2022



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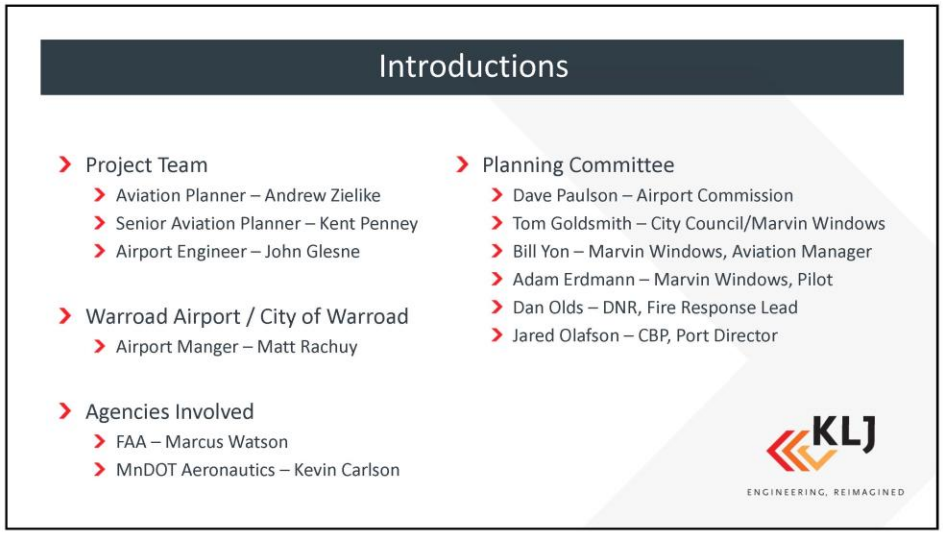
Planning Study Kickoff Meeting Continued – November 2022



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Why is Airport Planning needed now?

Targeted Airport Planning Study Objectives

- Evaluate main apron and aircraft parking layout
- Evaluate taxiway geometry and separation
- Review future hangar and taxilane layout
- Identify Approach Surface obstructions
- Siting of new AWOS
- Runway Safety Area Analysis
- Bring ALP to current design standards

Last Airport Layout Plan approved in 2012

Upcoming parallel taxiway reconstruction

ALP brought to current FAA design standards

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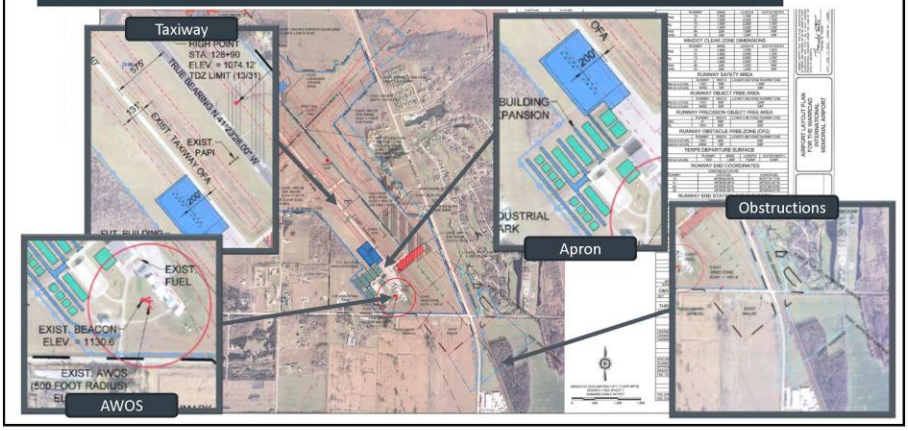
2012 Airport Layout Plan (ALP)



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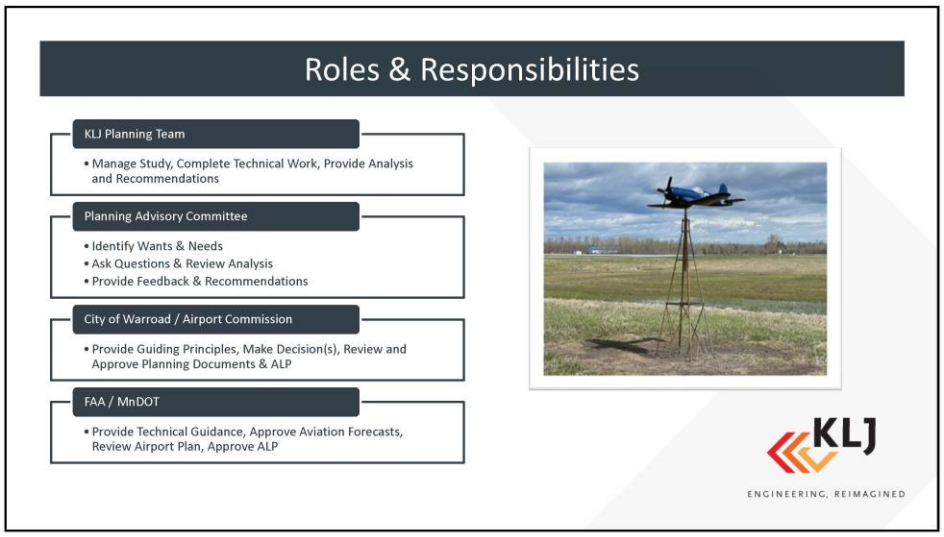
Roles & Responsibilities
KLJ Planning Team
• Manage Study, Complete Technical Work, Provide Analysis and Recommendations
Planning Advisory Committee
• Identify Wants & Needs
• Ask Questions & Review Analysis
• Provide Feedback & Recommendations
City of Warroad / Airport Commission
• Provide Guiding Principles, Make Decision(s), Review and Approve Planning Documents & ALP
FAA / MnDOT
• Provide Technical Guidance, Approve Aviation Forecasts, Review Airport Plan, Approve ALP
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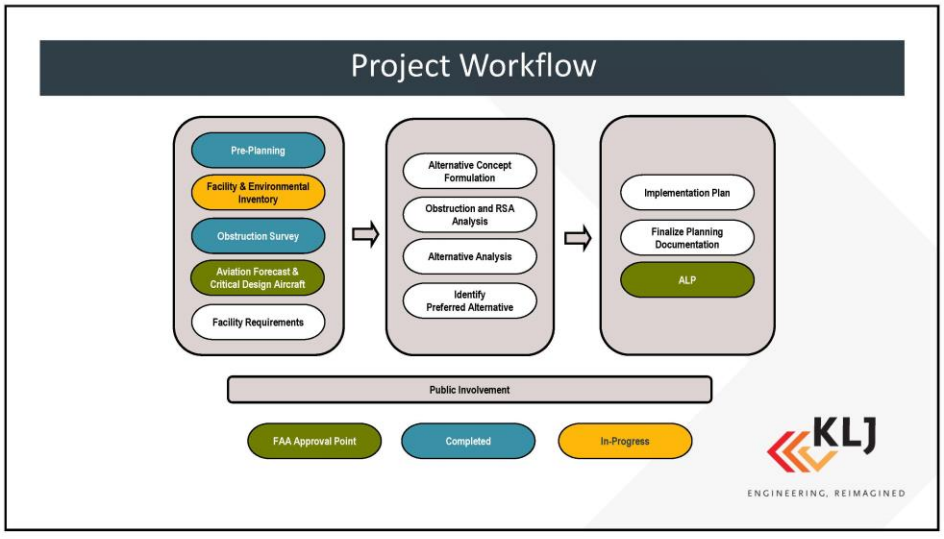
Project Workflow
Pre-Planning
Facility & Environmental Inventory
Obstruction Survey
Aviation Forecast & Critical Design Aircraft
Facility Requirements
Alternative Concept Formulation
Obstruction and RSA Analysis
Alternative Analysis
Identify Preferred Alternative
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Finalize Planning Documentation
ALP
Public Involvement
FAA Approval Point
Completed
In-Progress
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Existing Airfield

- Paved Runway 13-31
- Turf Runway 4-22
- Parallel Taxiway
  - 40' width
- Automated Weather Observation System (AWOS-III)
- Approach Lighting System
  - MALSR – Rwy 13-31
- Runway 31 ILS Approach
  - ½ Mile Visibility
  - 200' Ceiling
- Runway 13 GPS Approach
  - ¾ Mile Visibility
  - 200' Ceiling

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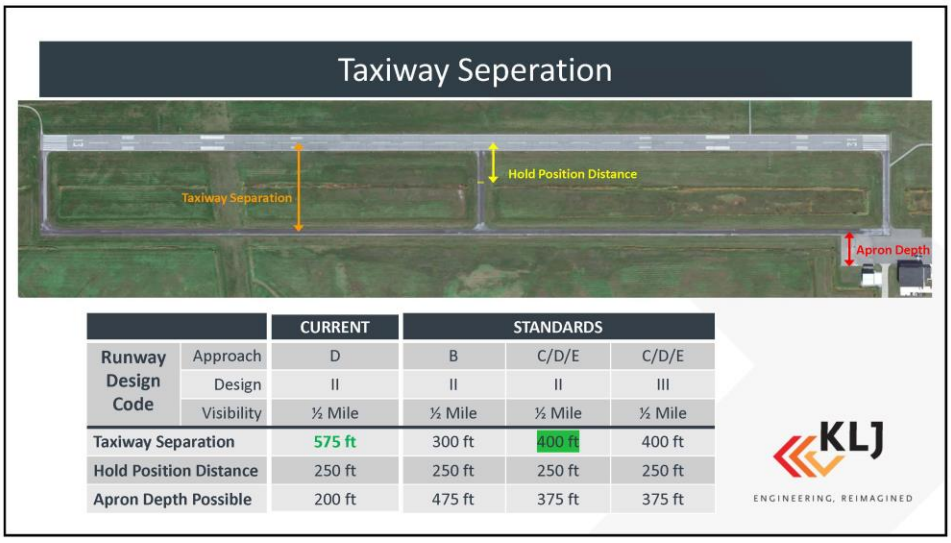
Terminal Area

- Main Aircraft Apron
  - 900' width by 200' depth
  - 19,000 SY
  - 6 tiedowns
- 16 hangars/units
  - Box and T-hangar
  - City, corporate, and private ownership
- 100LL & Jet A
- Customs
- DNR Fire Operations

10

11



		CURRENT	STANDARDS		
Runway Design Code	Approach	D	B	C/D/E	C/D/E
	Design	II	II	II	III
	Visibility	½ Mile	½ Mile	½ Mile	½ Mile
Taxiway Separation		575 ft	300 ft	400 ft	400 ft
Hold Position Distance		250 ft	250 ft	250 ft	250 ft
Apron Depth Possible		200 ft	475 ft	375 ft	375 ft

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Next Steps
Complete Airport Inventory
Outreach to Stakeholders (Mary Lynch)
Draft Aviation Forecasting
Draft Facility Requirements
Next Meeting: Facility Requirements & Preliminary Alternatives
Website: https://warroad.airportplan.net/
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Questions/Comments
Andrew Zielike, Aviation Planner
Andrew.zielike@kljeng.com
612.314.6545 m
651.726.5031 o
Kent Penney, Senior Aviation Planner
kent.penney@kljeng.com
605.939.9535 m
605.872.5005 o
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Meeting Minutes

Date: 11/8/2022
Time: 10:30 AM
Facilitator: Andrew Zielike
Minutes: Warroad Planning Study Kickoff

Attendees: Dave Paulson, Bill Yon, Jarod Olafson, Adam Erdmann, Dan Olds (virtual), Matt Rachuy, Kent Penney (virtual), Amber Channel (virtual), Andrew Zielike, John Glesne

Agenda Topics

Airport Planning

1. Upcoming Parallel Taxiway reconstruction drove the planning as pavement and layout will need to be brought to current standards.
2. This planning study will be a targeted planning effort focusing on taxiway, apron and hangar areas.
    a. Additional specific items were also requested by the FAA and State to be included in the scope.
        i. AWOS siting
        ii. Obstruction analysis
        iii. Runway Safety Area analysis
3. Additional Considerations
    a. Jarod Olafson, U.S. Customs, said they operate occasionally on the airfield with the clearing of international aircraft usually occurring in front of the terminal building. A dedicated customs facility does not need to be considered
    b. Mid-field connector taxiway location is usable for runway exit by smaller General Aviation aircraft but not for larger turbo prop and jet aircraft. Consider relocating the taxiway connector closer to Runway 4-22.
    c. Bill Yon, Marvin Windows, recommended looking at paving Runway 4-22. Wind data will be examined as part of the planning study which will drive future discussion on crosswind runway. A future planning may be needed to further evaluate paving the crosswind runway.

Roles & Responsibilities

1. One of the primary goals of this kickoff meeting is for the airport and Planning Advisory Committee (PAC) to identify needs and issues that should be considered throughout the planning study.
2. The role of the PAC is to identify wants and needs, review analysis, and provide feedback and recommendations throughout the planning study.
3. FAA approval will be required at two points throughout the study.
    a. Aviation Forecast
    b. Airport Layout Plan

Existing Conditions

1. Airfield
2. Terminal Area

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a. For the apron depth/layout issue there will be a lot of focus on distance and separation standards. For B-II require 110' of separation. The far west side of the apron is for DNR operations.
b. Any other utilities/services to consider?
    i. Septic for city/Marvin, and DNR waterlines for filling.
    ii. Propane tanks are gone so can add parking now? Only have underground tanks behind fence.
c. Parking considerations/issues:
    i. Every spot touching the Marvin building are for Marvin.
    ii. The middle parking area is public parking.
    iii. DNR park in the grass area on the west apron side. Would DNR like parking? The grass works for them currently.
    iv. 25% increase of parking and gets tight.
    v. Customs only parks in the parking lot if they get there early, most of the time they drive onto the apron to meet the aircraft.
    vi. If move the fuel can the parking lot be expanded?
d. Fuel system: replacement life is probably around 10 years, currently underground but it will be suggested to have aboveground tanks. What are the general thoughts on the current location?
    i. If move aboveground then vote to move it, don't like the idea of it being there with aboveground tanks.
    ii. Open to our suggestions.
    iii. Should still be self-service available if move, and if have fuel trucks would prefer that.
    iv. DNR does not fuel at Warroad and with the Dash 8 it would probably only come in to reload, no overnight nor fuel.

3. Aircraft Operations

a. The DNR logs annual aircraft operations. Dan Olds will get that information and will send it over to Andrew

b. Other kinds of aircraft operations/more frequent?
    i. Polaris have KA200, Kodiaks, Caravans
    ii. Commercial service like DenverAir was considered and studied but haven't heard anything about it for a year or so. Is it worth looking at the space for this? No.
    iii. Just regular locals operating VFR
c. Saw 1/3 of operations are itinerant, while 2/3 or 6,000 ops are local operating within 20NM. This seems a little suspicious, does this seem right?
    i. Seems off, Marvin is leaving the airfield so they fall into itinerant, DNR could be local, but should be the other way around.
d. Vast majority of IFR operations are B-II aircraft, business jets would be group III, and only saw a handful that would have a larger wingspan. See any changes in fleet?
    i. No but thinking of the weight of the aircraft for taxiway.
    ii. Dash 8 is group III.
    iii. D-II airport for approach speeds

Taxiway Discussion

1. Taxiway separation considerations
    a. Marvin aircraft fit into B-II and a D-II aircraft can still use the airport if have standards based on a B-II category. Once there are 500 annual ops of a D-II category the FAA will use that as a critical design aircraft and then the airfield needs to meet those standards.
    b. This is one of the items the FAA identified because of how much extra space there is outside the requirements and so see if extra pavement isn't eligible for funding.
2. Direct Access
    a. Need to fix the direct access from the apron to the runway.
3. Any noticeable deficiencies/issues on taxiway/apron/fueling?
    a. The apron depth, have trouble maneuvering on the apron if an aircraft is parked in far that left tiedown spot, the turn gets tight for Marvin and aircraft parking by terminal hangar.
    b. DNR: currently fine but tiedowns are required by some vendors at night. All of the tiedown spots are taken up when two AT-802 aircraft are tied down. A couple of tiedowns on the west side of the apron would free up the other end to the south. It would also make sense to position the 802 where they can just sit and tiedown at the end of the night without startup. Dan Olds will provide information on where the water tanks are staged.

Other Notes or Information

None

Targeted Airport Planning Meeting #2 – April 2023

1

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Introductions

- Project Team
  - Aviation Planner – Andrew Zielike
  - Senior Aviation Planner – Kent Penney
  - Airport Engineer – John Glesne
- Warroad Airport / City of Warroad
  - Airport Manager – Matt Rachuy
- Agencies Involved
  - FAA – Marcus Watson
  - MnDOT Aeronautics – Kevin Carlson
- Planning Committee
  - Dave Paulson – Airport Commission
  - Tom Goldsmith – City Council/Marvin Windows
  - Bill Yon – Marvin Windows, Aviation Manager
  - Adam Erdmann – Marvin Windows, Pilot
  - Dan Olds – DNR, Fire Response Lead
  - Jared Olafson – CBP, Port Director

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Progress To Date

- Facility Inventory
- Obstruction Analysis
  - Tree Penetrating Part 77
  - Trees below Part 77

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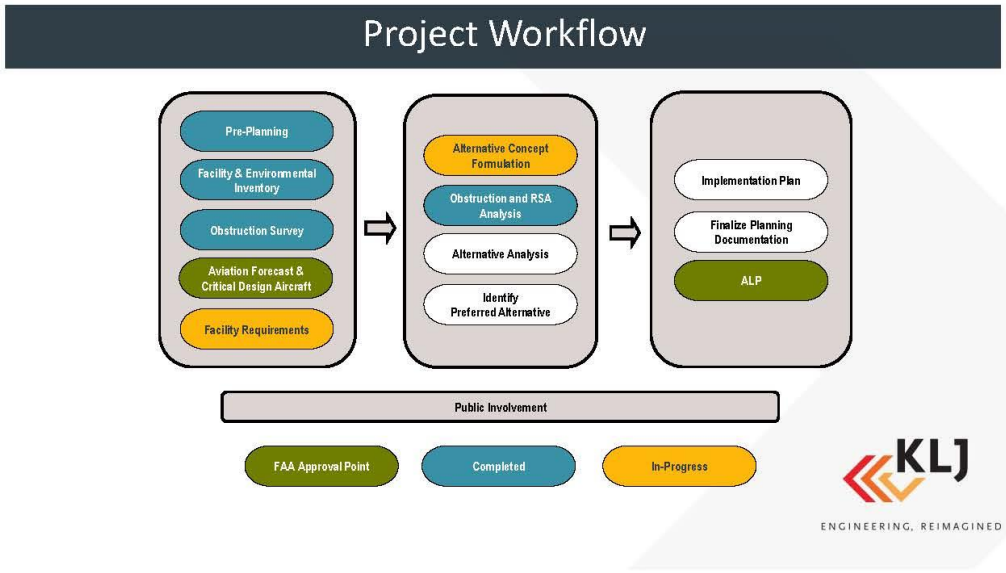
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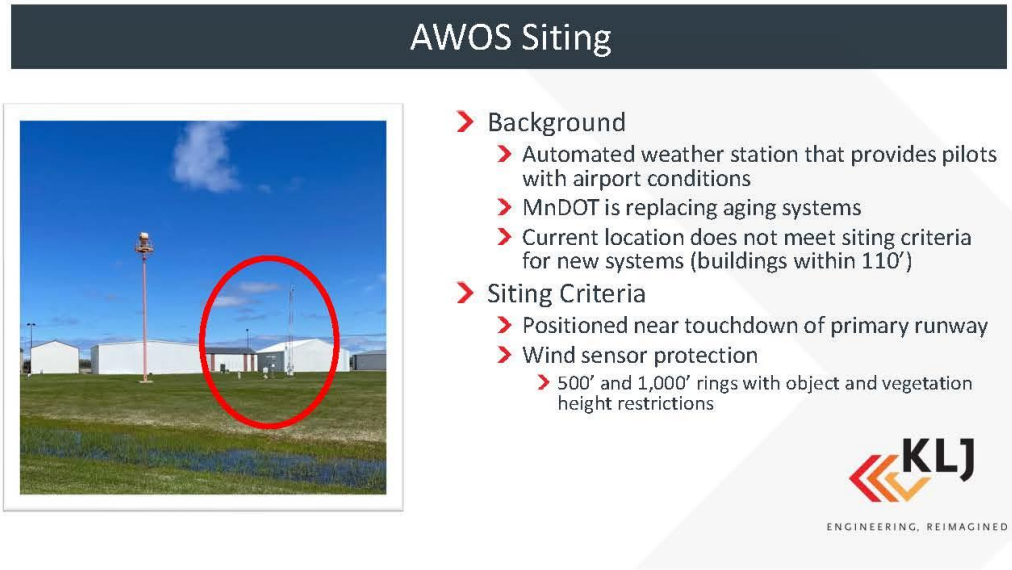
AWOS Siting
Background
Automated weather station that provides pilots with airport conditions
MnDOT is replacing aging systems
Current location does not meet siting criteria for new systems (buildings within 110')
Siting Criteria
Positioned near touchdown of primary runway
Wind sensor protection
500' and 1,000' rings with object and vegetation height restrictions
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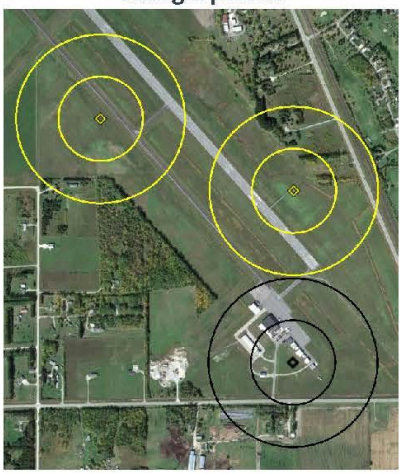
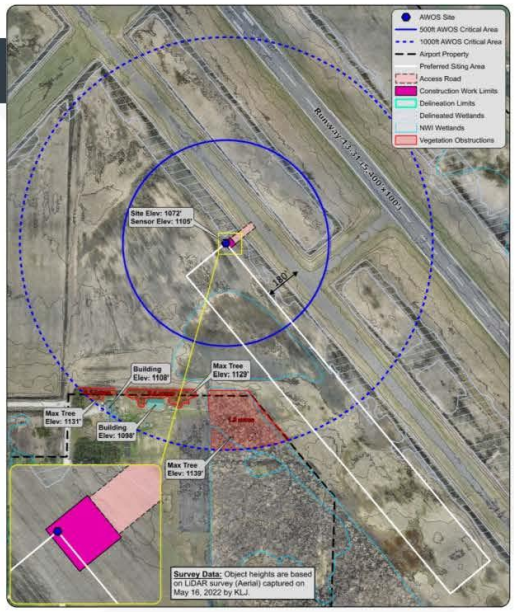
AWOS Siting

Siting Options





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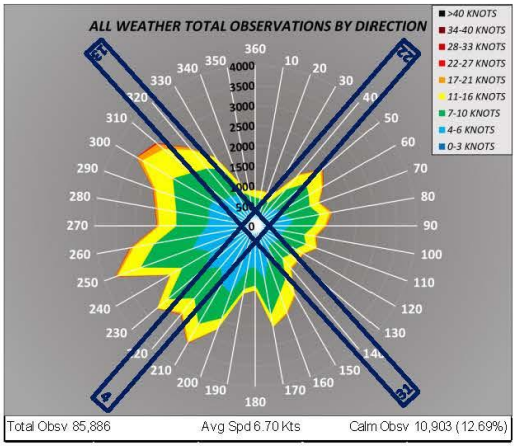
Wind Analysis



ALL-WEATHER WIND COVERAGE			
CONFIGURATION	CROSSWIND COMPONENT		
	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 13-31	93.50%	97.56%	99.37%
RUNWAY 4-22	92.19%	96.85%	99.06%
COMBINED	99.29%	99.84%	99.98%

SOURCE: KRRT AWOS (2009-2018, HOURLY) FROM NATIONAL CLIMATIC DATA CENTER
85,886 TOTAL OBSERVATIONS

INSTRUMENT FLIGHT RULES (IFR) WIND COVERAGE			
CONFIGURATION	CROSSWIND COMPONENT		
	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 13-31	90.87%	95.95%	98.70%

SOURCE: KRRT AWOS (2009-2018, HOURLY) FROM NATIONAL CLIMATIC DATA CENTER
7,358 TOTAL OBSERVATIONS
IFR = VISIBILITY LOWER THAN 3 MILES OR CEILING LOWER THAN 1,000 FEET

Table B-1. Allowable Crosswind Component per Runway Design Code (RDC)

RDC	Allowable Crosswind Component
A-I and B-I *	10.5 knots
A-II and B-II	13 knots
A-III, B-III, C-I through D-III D-I through D-III	16 knots
A-IV and B-IV, C-IV through C-VI, D-IV through D-VI E-I through E-VI	20 knots 20 knots

Notes: * Includes A-I and B-I small aircraft

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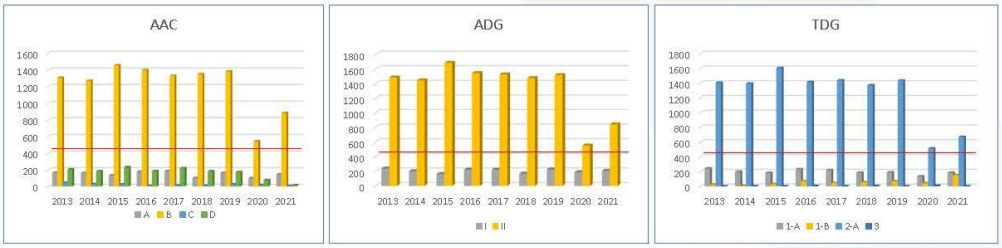
Critical Design Aircraft



- Aircraft Approach Category **B** – 91 to 121 Kts
- Airplane Design Group **II** – 49' to 79' wingspan
- Taxiway Design Group **2A**
  - Main Gear Width – 15' to 20'
  - Cockpit to Main Gear – 20' to 40'

Source: FAA 2021 TAF, TFMSC 2021 IFR Operations

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Aircraft Greater than Critical Design

- Potential use of B-III / TDG-3 Dash 8 by DNR
  - Wingspan 97 Feet
  - TOFA ADG-III – 171 feet *(ADG-II 124 feet)*
  - Main Gear Width – 31 feet
  - Twy Width TDG-3 – 50 feet *(TDG-2A – 35 feet)*
- Unlikely to meet the 500 operations threshold

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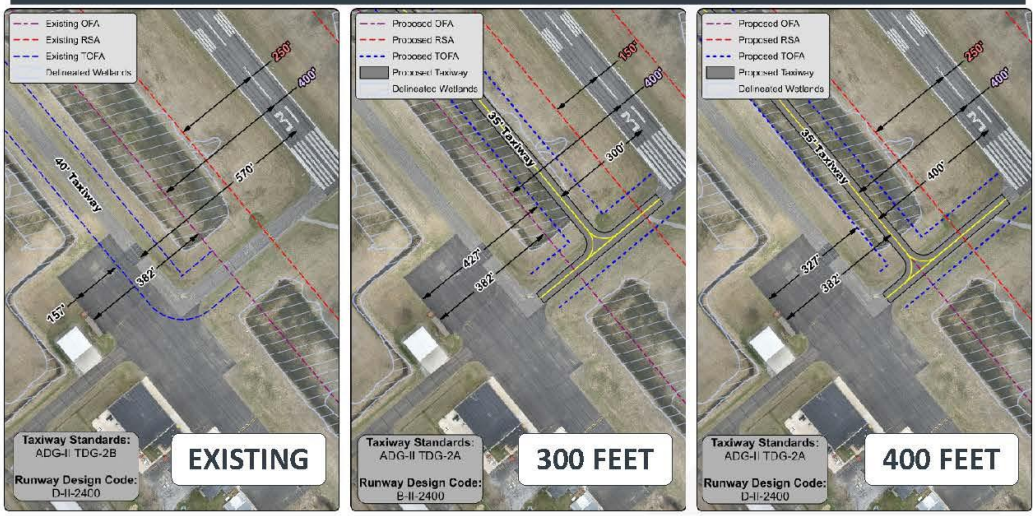
Parallel Taxiway Separation



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Summary Table

Parallel Taxiway Separation Summary Table

Metric	Parallel Taxiway Alternatives		
	Maintain Existing	300-Foot Separation	400-Foot Separation
Taxiway to Runway Separation	575'	300'	400'
Runway Design Standards	Exceeds Highest Standards (E-VI)	B-II-2400	C/D-II-2400
Allowable Apron Depth	157'	382'	327'
Wetlands Impacts	Potential (South Realignment)	Yes	Yes
Advantages	• Preserves capability for C/D Aircraft • Lowest Cost	• Substantial apron depth available • Least pavement	• Substantial apron depth available • Preserves capability for C/D Aircraft
Disadvantages	• Least apron depth available • Most pavement	• Restricts to B-II capability	• Less apron than 300' separation

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Open Discussion

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Next Steps

- Outreach to Stakeholders (Mary Lynch)
- Terminal / Hangar Area Layouts
- Next Meeting: Alternatives Analysis
- Website: https://warroad.airportplan.net/

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Questions/Comments
Andrew Zielike, Aviation Planner
Andrew.zielike@kljeng.com
612.314.6545 m
651.726.5031 o
Kent Penney, Senior Aviation Planner
kent.penney@kljeng.com
605.939.9535 m
605.872.5005 o
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Targeted Airport Planning Meeting #2 Continued – April 2023

Warroad Targeted Planning Study Meeting – April 10th, 2023

ATTENDANCE LIST

Engineering Reimagined

YEAR 2022

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Name (please print)	Organization/Business	Phone	Email (optional)
Jared Olafson	US Customs + Border Protection	218-386-3308	jared.r.olafson@cbp.dhs.gov
Bill Yon	MARVIN	218 242 9367	billyon@marvin.com
Dale Paulson	AIRPORT COMMISSION	218-242-3990	dpaulson59@gmail.com
Matt Rachuy	Airport Manager	218-242-9020	airport@warroadmn.org
Dan Olds (virtual)	MN DNR		dan.olds@state.mn.us
Tom Goldsmith (virtual)	Marvin		tomgolds@marvin.com
Kent Penney (virtual)	KLJ		kent.penney@kljeng.com
Amber Channel (virtual)	KLJ		amber.channel@kljeng.com
John Glesne	KLJ		john.glesne@kljeng.com
Andrew Zielke	KLJ		andrew.zielke@kljeng.com

Meeting Minutes

Date: 4/10/2023 **Facilitator:** Andrew Zielike
Time: 2:00PM **Minutes:** PAC Meeting #2
Attendees: Tom Goldsmith, Dan Olds, Matt Rachuy, Dave Paulson, Jared Olafson, Bill Yon, Kent Penney, Amer Channel, John Glesne, Andrew Zielike

Agenda Topics

Facility Inventory & Obstruction Analysis

1. Reviewed some facility inventory needs and the trees in the obstruction analysis that penetrate the Part 77 surfaces and those below it.
    a. It was asked if the trees could remain and the landowner not be impacted? The planning team will try and leave them unimpacted and allow for unrestricted use and MnDOT may allow for shifting.

AWOS Siting & Wind Analysis

1. The current AWOS is aging and does not meet siting criteria for new systems so various locations around the airfield were presented.
    a. The sensor could be moved closer to the runway after taxiway relocation. This is something to consider depending on the timing of the taxiway work.
    b. After a new AWOS is installed, it is recommended data be collected for several years before a more thorough wind analysis will be conducted. Expect Runway 13-31 wind coverage to change new AWOS location.
2. The wind analysis was reviewed with the group and there is sufficient wind coverage with both runways for all weather conditions but not for all instrument flight rules (10.5 knots).
    a. It was stated that the weather may be inaccurate due to the location of the AWOS and hangars, they experience east and north winds.
    b. It should also be considered to pave the crosswind runway for it may be beneficial.
3. Contaminated conditions to wind coverage where also discussed.
    a. It was asked if there was a way to document the contaminated runway. It is possible to tell the story, use NOTAMs as much as possible for backup and the airport can keep record with runway condition codes.

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Critical Design Aircraft

1. Current aircraft approach category (AAC) is B, airplane design group (ADG) is II and taxiway design group (TDG) is 2A.
2. The Dash 8 (AAC: B, ADG: III, TDG: 3) is frequent at the airport it will not likely meet the 500-operation threshold to make it the design aircraft.
    a. Opportunities will be taken to accommodate these aircraft but will not meet regular use threshold.

Parallel Taxiway

1. The taxiway separation is further than what is needed. It is currently 575 feet from runway centerline to taxiway centerline with an apron depth of 200 feet. The minimum needed is 400 feet which would offer 375 feet of apron depth.
    a. The 400 foot separation would be preferred but will require an environmental assessment.
2. There is currently pavement rehabilitation needed and the taxiway is 40 feet wide which is above standards.
    a. It was expressed that the 40-foot-wide taxiway is preferred.

Other Notes or Information

For the construction project, the airports preference would be to have it done all at once but was discussed that it would be dependent on available funding. Would intend to complete the taxiway first.

Wetlands were discussed and the direct access from the apron to the runway will be evaluated


Warroad International Memorial Airport
Targeted Airport Planning Meeting #3 – September 12, 2023
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Agenda
Introductions
Progress to Date
Alternative Considerations
Alternatives
Questions/Comments
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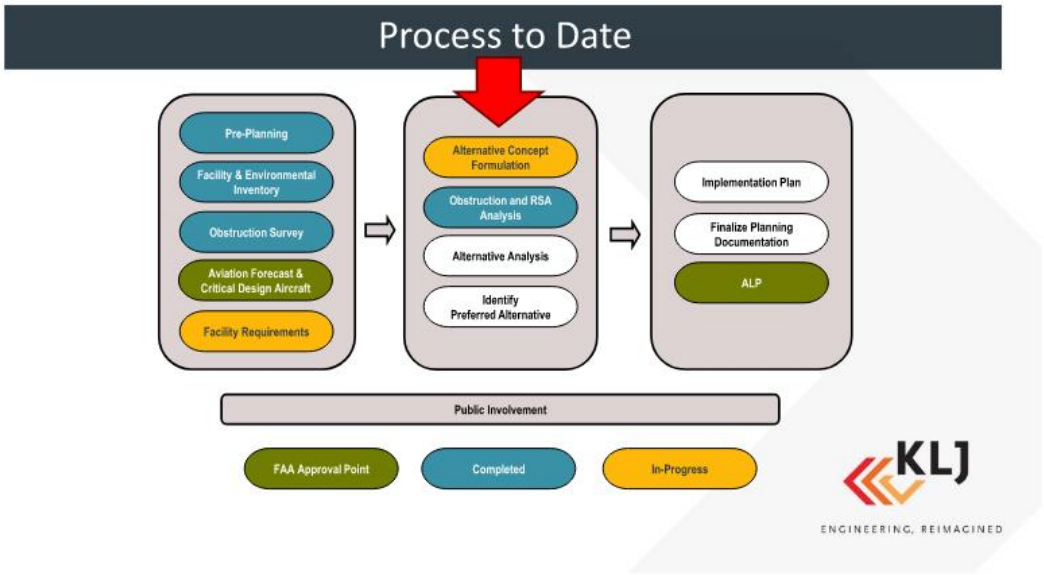
2

1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Completed
In-Progress
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Progress To Date
Chapters 1 and 2 drafted
FAA Comments Received
Agency Meeting with FAA and MnDOT
Wetland Jurisdictional Determination In Process
New EPA rule
Stakeholder Outreach
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Considerations for Alternatives

- Maneuvering for ADG-II and TDG-2A aircraft on apron
- Remove runway direct access
- Apron configuration and aircraft parking
- Fuel system and/or fuel truck locations
- Entrance road realignment
- Increased vehicle parking
- Group I & Group II hangar areas
- Snow Removal Equipment building expansion and location
- Septic system location
- Drainage ditch locations

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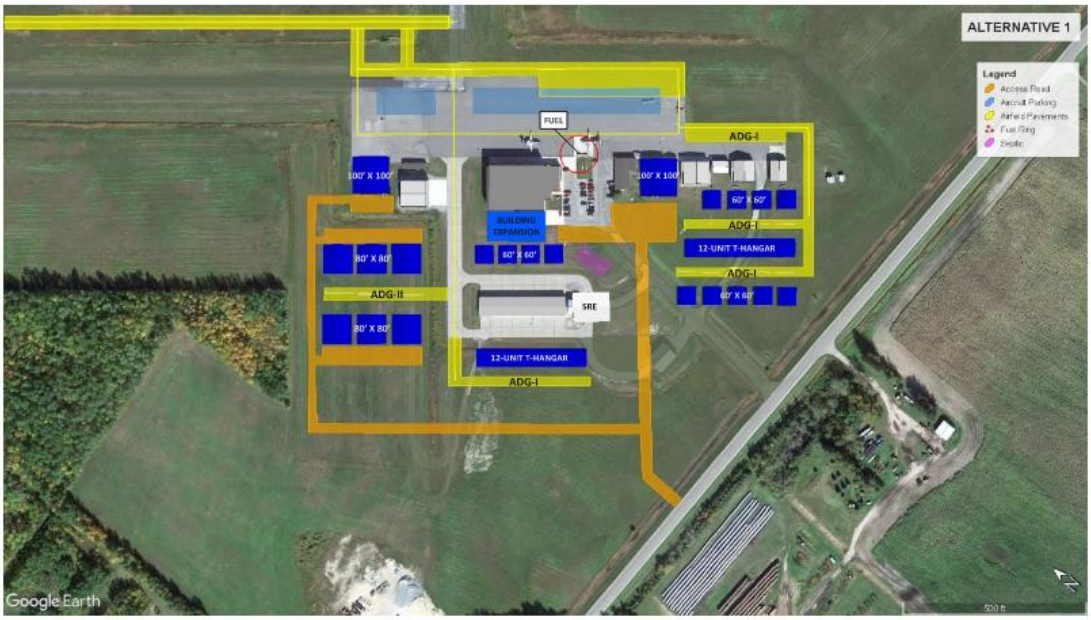
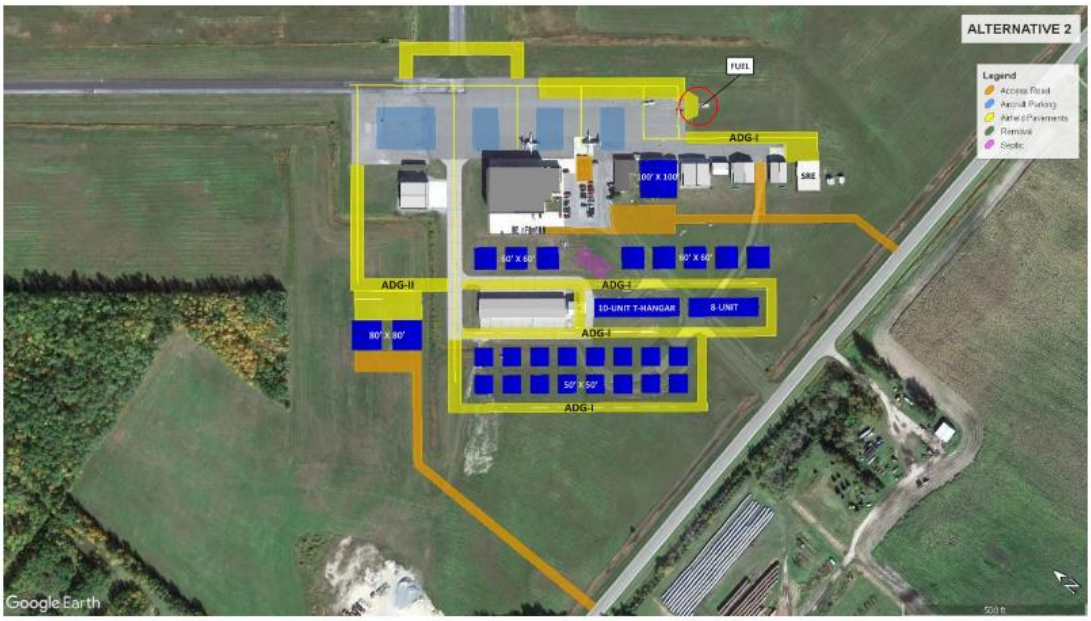

ALTERNATIVE 1
Legend
Access Road
Aircraft Parking
Airfield Pavements
Fuel Ring
Existing
FUEL
ADG-I
100' X 100'
60' X 60'
BUILDING EXPANSION
12-UNIT T-HANGAR
ADG-II
80' X 80'
SRE
Google Earth

7

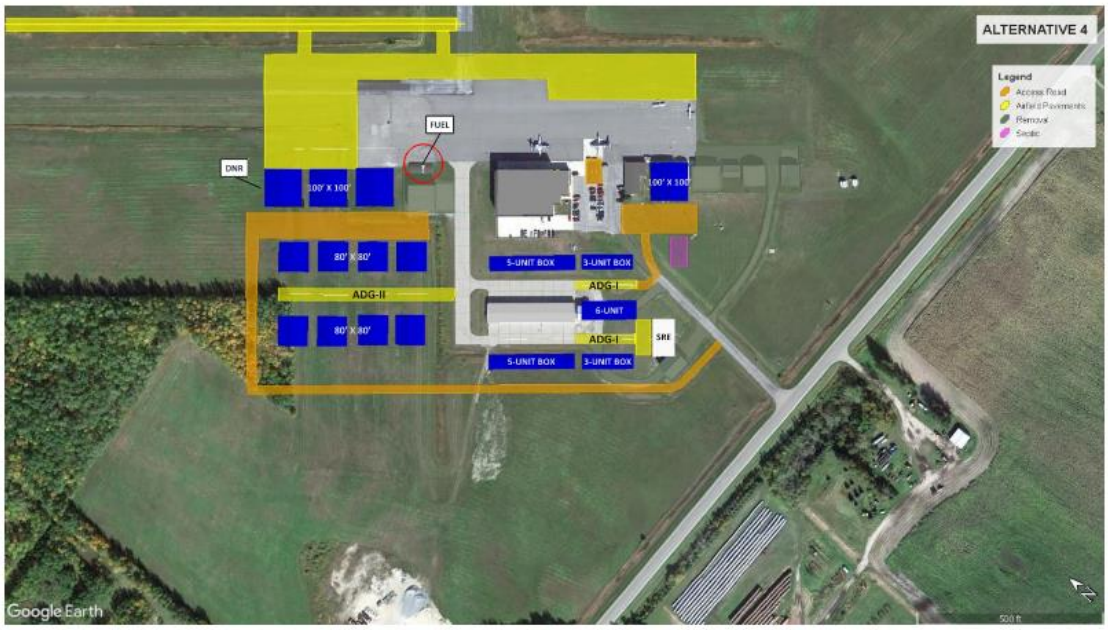

ALTERNATIVE 2
Legend
Access Road
Aircraft Parking
Airfield Pavements
Removal
Existing
FUEL
ADG-I
100' X 100'
SRE
60' X 60'
90' X 60'
ADG-II
10-UNIT T-HANGAR
8-UNIT
80' X 80'
50' X 50'
Google Earth

8

4


ALTERNATIVE 3
Legend
FUEL
ADG-II
60' X 60'
ADG-I
8-UNIT
12-UNIT T-HANGAR
SRE
80' X 80'
Google Earth

9


ALTERNATIVE 4
Legend
FUEL
DNR
100' X 100'
80' X 80'
ADG-II
ADG-I
5-UNIT BOX
3-UNIT BOX
6-UNIT
SRE
Google Earth

10

5

Open Discussion

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Next Steps

- Refine Alternatives
- Implementation

- Public Open House: Oct 10th 8:00 – 11:00
- Next Meeting Final Alternatives: Oct 10th 1:00 – 2:30

- Website: https://warroad.airportplan.net/

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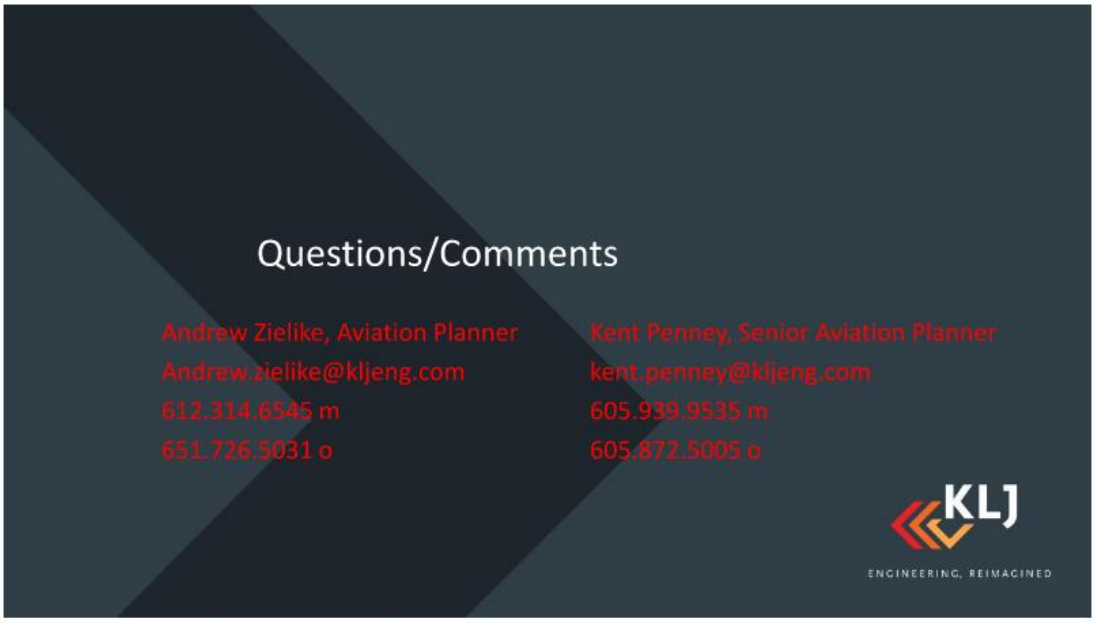
12

6


Questions/Comments
Andrew Zielike, Aviation Planner
Andrew.zielike@kljeng.com
612.314.6545 m
651.726.5031 o
Kent Penney, Senior Aviation Planner
kent.penney@kljeng.com
605.939.9535 m
605.872.5005 o
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Meeting Minutes

Date: 9/12/2023 **Facilitator:** Andrew Zielike
Time: 3:00PM **Minutes:** PAC Meeting #3 (Microsoft Teams)
Attendees: Dave Paulson, Tom Goldsmith, Bill Yon, Dan Olds, Matt Rachuy, John Glesne, Amber Channel, Andrew Zielike

Agenda Topics

Progress to Date

1. Chapter 1: Airport Overview & Activity and Chapter 2: Runways & Taxiways have been drafted and submitted to FAA and MnDOT. FAA comments have been received.
2. Agency Meeting with FAA and MnDOT in May. Agencies agreed with 400' taxiway to runway separation is acceptable for preservation but also recommended alternatives that utilize exiting taxiway to minimize wetland impacts.
3. Wetland Jurisdictional Determination in Process. New EPA rule is being evaluated for the Linear Ditches on the airport.
4. Stakeholder Outreach has commenced with Mary Lynch (Subconsultant). Polaris indicated they may operate a Phenom 300 aircraft occasionally out of Warroad.

Alternative Considerations

Key planning considerations for the terminal area are meeting maneuvering standards for ADG-II aircraft, provide aircraft parking, remove direct access to runway, and future location for fuel system. Committee members reviewed the current ALP and four initial terminal and hangar area concepts to select elements to carry forward to the refined alternatives. Discussion focused on each functional area.

1. Parallel Taxiway and Direct Access
   a. Members asked if the apron could be connected to the runway via a 45-degree angle rather than 90-degree turn to resolve direct access. Zielike stated the standards require a 90-degree turn.
   b. A revised alternative should evaluate a taxiway with 400' separation from the runway then ties back into the existing taxiway.
2. Apron
   a. The airport and committee members would like to maximize ramp space
   b. Preferred alternatives where aircraft parking was middle of apron running parallel with the building line.
   c. Committee members preferred the rectangular shape of Alternative 4 apron design.

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3. Fuel System
    a. Members stated they liked the location of the fuel system on the south side of the apron (Alternative 2)
    b. Marvin Windows liked the location of the fuel system northwest of their hangar in Alternative 4 because it would move traffic away from their hangar
4. SRE Building
    a. Airport preferred SRE Building location in Alternative 2 in the far southeast corner of the apron
5. Hangars
    a. Bill Yon, Marvin Windows, said that Marvin would still want a hangar expansion area and the door would need to be north facing to allow access to the taxiway. He will be getting a batter idea of what size they are looking for.
    b. It was suggested reducing Marvin building expansion from previous ALP to allow hangars to fit behind along the taxilane (Depicted in Alternative 1).
    c. It was preferred to leave the existing access road and southeast hangar development as it currently exists.
    d. More development for box hangars are desired for area near existing T-Hangar and future north development

Next meeting will be held in October where two new alternatives will be developed and presented based on the feedback from this discussion.

Other Notes or Information

a. Airport and Marvin Window would not like to move their existing septic system. Hangar development should be designed around them.

Next Meeting Information

Date: 10/10/2023
Time: 2:00 PM
Facilitator: Andrew Zielike
Minutes: PAC Meeting #4

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Warroad International Memorial Airport
Targeted Airport Planning Meeting #4 – October 10, 2023
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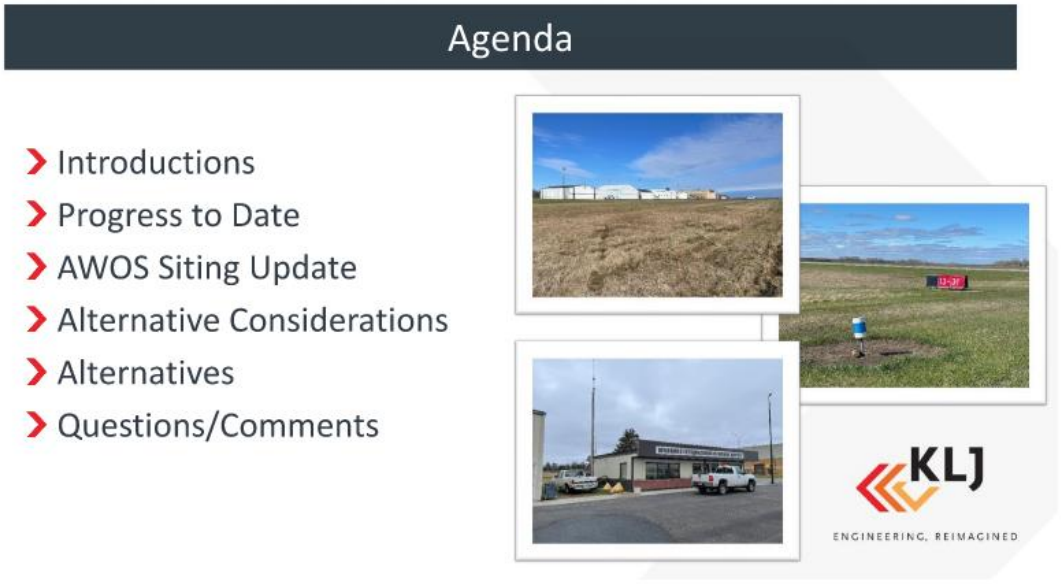
Agenda
Introductions
Progress to Date
AWOS Siting Update
Alternative Considerations
Alternatives
Questions/Comments
KLJ
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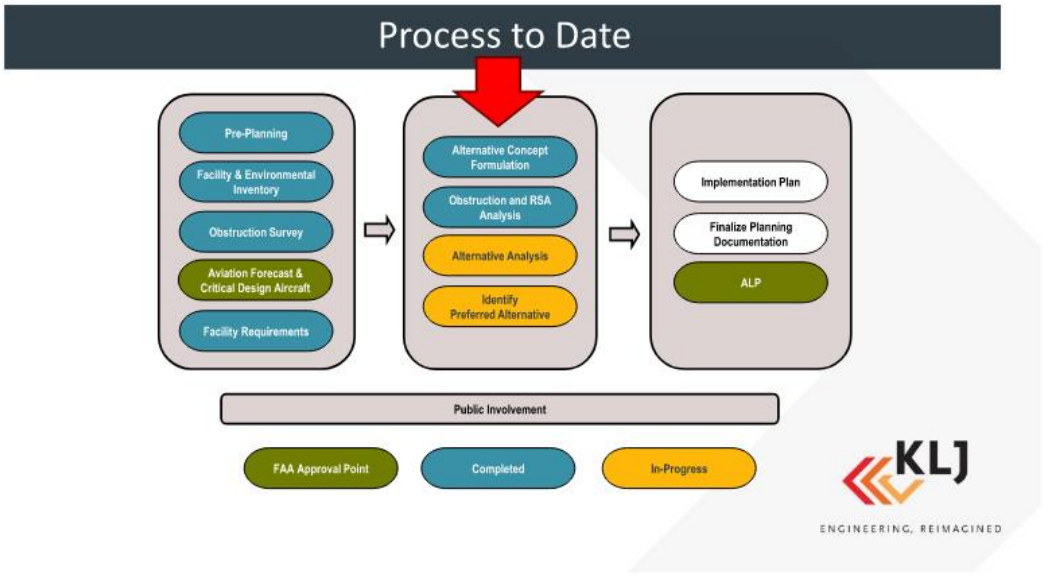
2

1


Process to Date
Pre-Planning
Facility & Environmental Inventory
Obstruction Survey
Aviation Forecast & Critical Design Aircraft
Facility Requirements
Alternative Concept Formulation
Obstruction and RSA Analysis
Alternative Analysis
Identify Preferred Alternative
Implementation Plan
Finalize Planning Documentation
ALP
Public Involvement
FAA Approval Point
Completed
In-Progress
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3


Progress To Date
Refined and drafted new alternatives
FAA Briefing
Wetland Jurisdictional Determination
Agency Meeting with ACOE
Results needed to finalize parallel taxiway layout
Discussions on future fleet mix
Public Information Meeting
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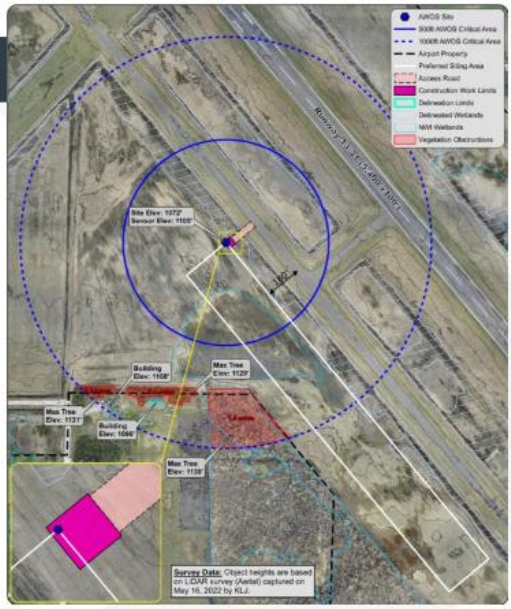
2

AWOS Siting

Siting Options



5

Design Aircraft

Aircraft Approach Category B

- Represents speed that aircraft approaches runway
- 91 to 121 Kts

Airplane Design Group II

- Represents wingspan and height of aircraft
- 49' to 79' wingspan

Taxiway Design Group 2A

- Represents pavement width and turning clearance needed by aircraft
- Main Gear Width – 15' to 20'
- Cockpit to Main Gear – 20' to 40'

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6

3

What to Consider?

- Removing direct access to runway
- Sufficient aircraft loading/unloading space
- Aircraft parking locations
- Fuel system location
  - Convenient for Aircraft
  - Landside loading
- Locations for hangars in short term
- Logical expandability of apron and hangar area
- Space and location for additional vehicle parking

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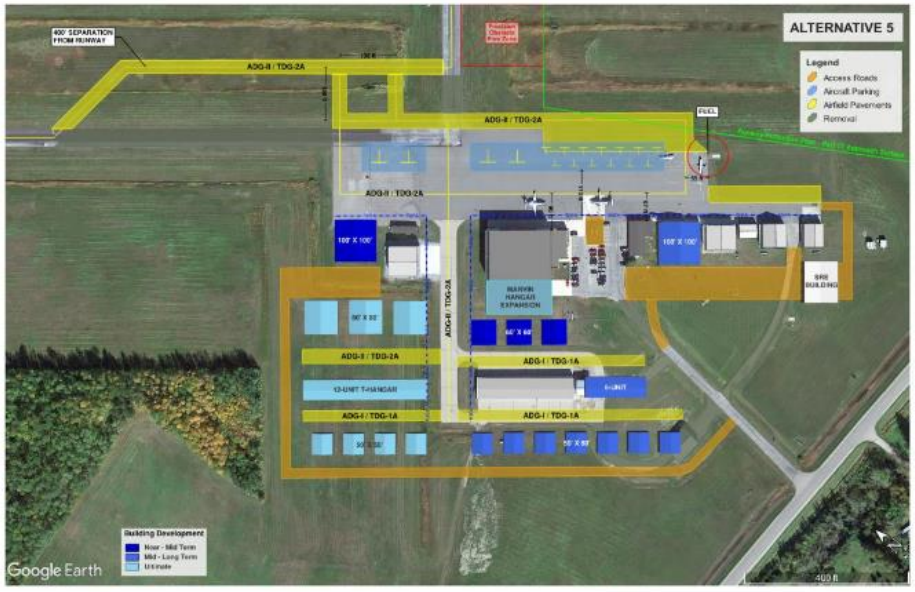

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Summary Table

Terminal Area Alternatives Summary Table

Metric	Terminal Area Alternatives	
	Alternative 5	Alternative 6
Key Elements	• Rectangular Apron • Dual Taxilane Maneuvering • Fuel System – Edge of Apron • 4 Large Tie-Downs • 13 Small Tie-Downs Nested • 22,200 SY* Apron Pavement	• Stepped Apron – Avoid Surfaces • Single Taxilane Maneuvering • Fuel System – Aligned with Hangars • 4 Large Tie-Downs • 6 Small Tie-Downs • 22,000 SY* Apron Pavement
Advantages	• Efficient Design Maximizes Parking • Dual Taxi Routes Reduces Points of Conflict • Increased Eligibility of Apron Pavement • Substantial Space for Vehicle Parking • Available Apron Space for Larger Hangars • T-Hangar Taxilane Adjustment Maximizes Depth for Hangar Development	• Apron Pavement Clear of RPZ and Part 77 Approach Surface • Maximum Apron Depth • Aircraft Loading/Unloading Near Buildings and Hangars • Fuel Tankers Remain Landside • New Small Hangars Development Available Immediately • Secondary Access Taxilane for Small Hangars
Disadvantages	• Apron Taxilane Penetrates RPZ and Part 77 Approach Surface • Fuel Tankers Need Airside Access • Aircraft Loading/Unloading in Center of Apron • New Hangar Development Requires Pavement Project	• Fewer Aircraft Parking Tie-Downs • More Ineligible Pavement Area • Aircraft Loading/Unloading and Fueling may Block Taxilane • No Apron Space for Large Hangar Development • Fewer Small Hangar Development

*Note – Excludes parallel taxiway and arterial taxilane pavements

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5

Open Discussion

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Next Steps

- Develop Preferred Alternative
- Agency Meeting
- Implementation
- Draft ALP

- Website: https://warroad.airportplan.net/

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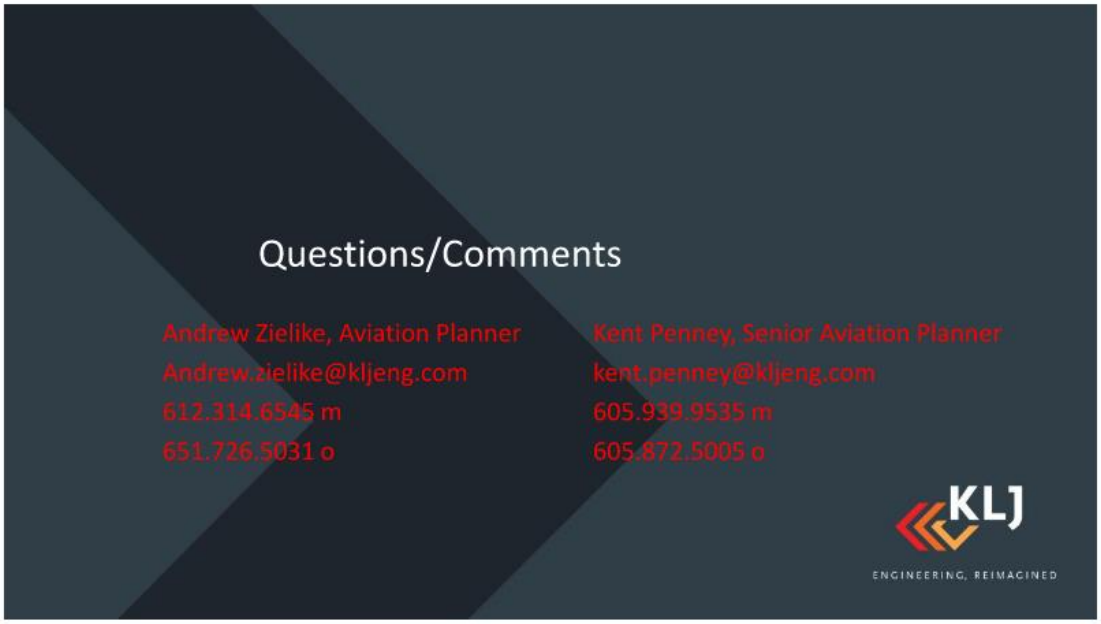
Questions/Comments
Andrew Zielike, Aviation Planner
Andrew.zielike@kljeng.com
612.314.6545 m
651.726.5031 o
Kent Penney, Senior Aviation Planner
kent.penney@kljeng.com
605.939.9535 m
605.872.5005 o
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Warroad Targeted Planning Study Meeting – October 10th, 2023

ATTENDANCE LIST

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Name (please print)	Organization/Business	Phone	Email (optional)
DAVE PAULSON	AIRPORT COM.	218-242-3990	drpaulson58@gmail.com
TOM GOLDSMITH	City	701-446-6468	TOMGOLDS@MHARVIN.COM
Matt Rachuy	Airport	218-242-9020	airport@warroadmn.org
Andrew Zielke	KLJ		
Jack Vogt	KLJ		
John Clesne	KLJ		
Amber Channel (Remote)	KLJ		

Meeting Minutes

Date: 10/10/2023 **Facilitator:** Andrew Zielike
Time: 2:00PM **Minutes:** PAC Meeting #4
Attendees: Dave Paulson, Tom Goldsmith, Matt Rachuy, Andrew Zielike, Jack Vogt, John Glesne, Amber Channel

Agenda Topics

Progress to Date

1. Terminal Area alternatives were refined from the feedback received last meeting, taking various elements and incorporating into two refined alternatives.
2. Communications and meeting with Army Corps of Engineers and FAA to receive Jurisdiction Determinations on the Wetlands and Linear Ditches identified near the Parallel Taxiway. This information will determine the environmental documentation (Environmental Assessment, CATEX, etc.) that would be needed and a key decision making component for the Parallel Taxiway.
3. Public Open House held this morning (October 10, 2023) from 8:00-10:00
    a. There was one individual in attendance, a helicopter pilot from Sky Skopes. He noted the fuel location and available aircraft parking shown on both alternatives were an improvement as it allows more space to maneuver around the apron. He noted that helicopter maneuvering and parking needs additional space from smaller parked aircraft.

AWOS Siting

1. The two sites considered and proposed location for the future AWOS were reviewed. The proposed location is along the west side of the runway near mid-field. It is at the furthest limits of the siting criteria and contains trees and structures within the 1,000' ring that will remain.
    b. KLJ is working with MnDOT to determine if AWOS site would receive commissioning, then will be able to work with FAA to have it approved on the ALP
    c. FAA noted that an ultimate easement may need to be depicted on the ALP for the ability to protect from future vegetation and structures from further impacting the sensors ability to accurately report wind.
    d. Tom Goldsmith, Marvin, asked what the options would be if they don't allow commissioning of that site. Andrew Zielike, KLJ, responded that they would have to explore going further north beyond siting standards and if that would be allowed.

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Alternatives Review

The two refined Terminal Area Alternatives (Alternative 5 and 6) were reviewed and discussed by each functional area. Committee members were advised that the preferred terminal area alternative may contain a blend of components from both alternatives

1. Parallel Taxiway
    a. The construction of full length parallel taxiway with 400' separation from runway and associated connectors is estimated at $4.2 million
    b. A partial segment at 400' separation from runway and then tie-in to existing taxiway could be considered for reduction to wetland impacts and cost savings. The wetland jurisdictional determination will be needed prior to final decision.
    c. Goldsmith asked if we could leave the current taxiway connected to the apron.
        i. This could be considered but tie-in to apron and turns would need to be evaluated to allow for expansion and maneuvering.
2. Connector Taxiways and Removal of Direct Access
    a. Zielike explained the new standards require a 90 degree turn when taxing from the apron to the runway.
    b. The Precision Obstacle Free Zone cannot have the fuselage, engines or tails of taxing aircraft enter that area, which means the taxiway cannot extend beyond the threshold of the runway when set at 400' separation.
    c. The two taxiway connectors closer together were considered more favorable however both options would work.
3. Apron
    a. Alternative 5 depicts an efficient rectangular design apron with dual taxilane access to reduce taxing conflict. This alternative does have taxing surfaces inside the RPZ and Part 77 Approach Surface that would need to be evaluated.
    b. Alternative 6 depicts a stepped shape apron that avoids the RPZ and Approach Surface and has a single taxilane.
    c. Goldsmith questioned rather than widening the apron, could we add to its length.
        i. Current spacing does not allow adequate wing tip separation (110') and depth is needed to allow aircraft to go around each other.
        ii. Additionally, impacts to the wetlands located northwest of the apron would make it less favorable to expand in the near-term.
    d. The rectangular layout with dual taxilanes from Alternative 5 was selected as the preferred apron layout.
4. Fuel System
    a. The fueling location at the southeast edge of the apron (depicted in Alternative 5) was preferred.

b. The location next to the terminal in Alternate 6 eliminates prime real estate

5. SRE
   a. The airport needs more space for the storage of snow removal equipment.
   b. The location along the apron in Alternative 6 was preferred due to it being a more straightforward design
6. Hangars
   a. Hangar and taxilane layout from Alternative 5 was selected as preferred.
      i. Matt Rachuy, Airport Manager, noted the secondary access taxilane from Alternative 6 removes the last available space to put a large hangar along the apron.
      ii. Additional access road to future large hangar also allows for logical apron expansion to northwest in the future
   b. The taxilanes serving the T Hangar have greater separation that current standards reducing the amount of developable space between Marvin's parking lot and the T-Hangar.
      i. Moving the taxilane closer to the T-hangar to current standards allows development of up to 60' deep hangars, whereas doing nothing would only allow for 40' of development.
      ii. The committee agreed that leaving the southwest taxilane at it's current location would allow for immediate development and plan to shift the northeast taxilane in the future.

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Public Open House – October 2023

OCTOBER 10, 2023
WARROAD INTERNATIONAL MEMORIAL AIRPORT OPEN HOUSE

Targeted Airport Master Plan / Alternatives

The City of Warroad and KLJ Engineering and Planning would like to invite you an open house to provide an overview of the Targeted Airport Planning Project to date and to receive comments and feedback as to the proposed development of the airport. There will be opportunity to ask questions and provide written comments.

KLJ

8:00 A.M to 10:00 A.M

Warroad Airport Terminal Building 36955 Co Rd 13 Warroad, MN 56763

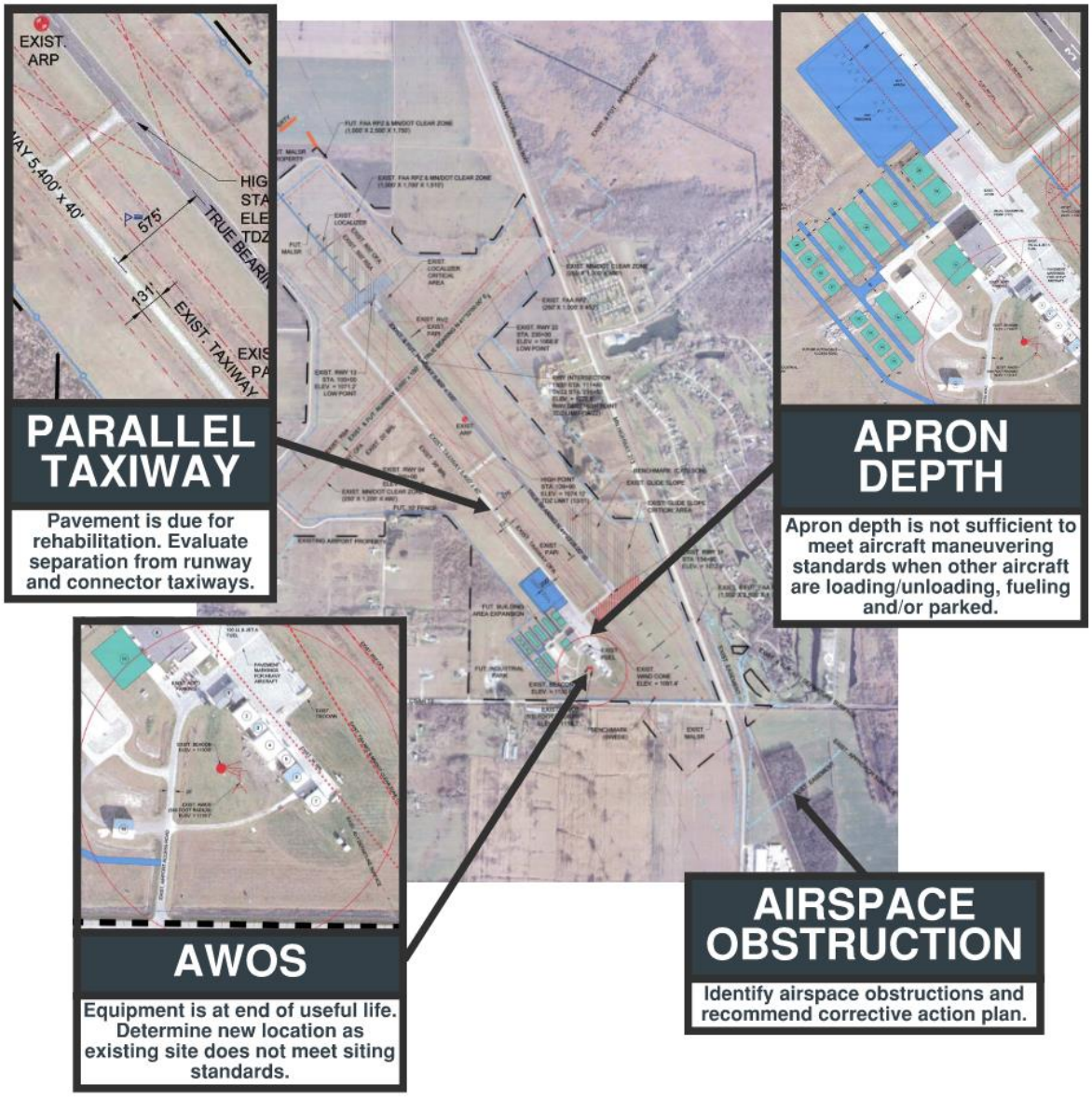
For more information, please visit https://warroad.airportplan.net/

Any individuals with disabilities who will require a reasonable accommodation in order to participate in the meeting should submit a request to Andrew Zielike, KLJ at 651-726-5031. Please request accommodations no later than two business days prior to the meeting in order to ensure accommodations are available.

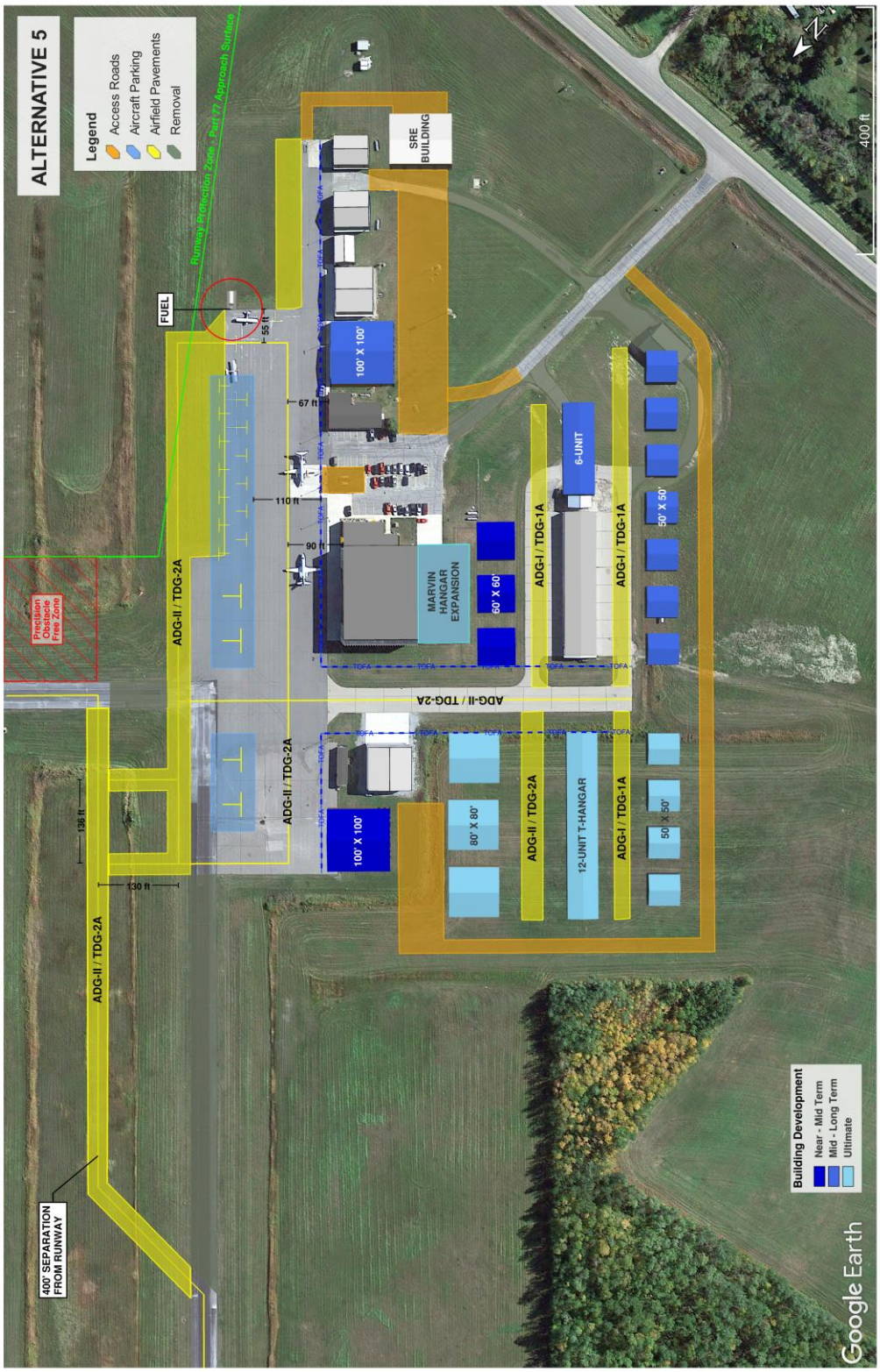
Public Open House Continued –October 2023

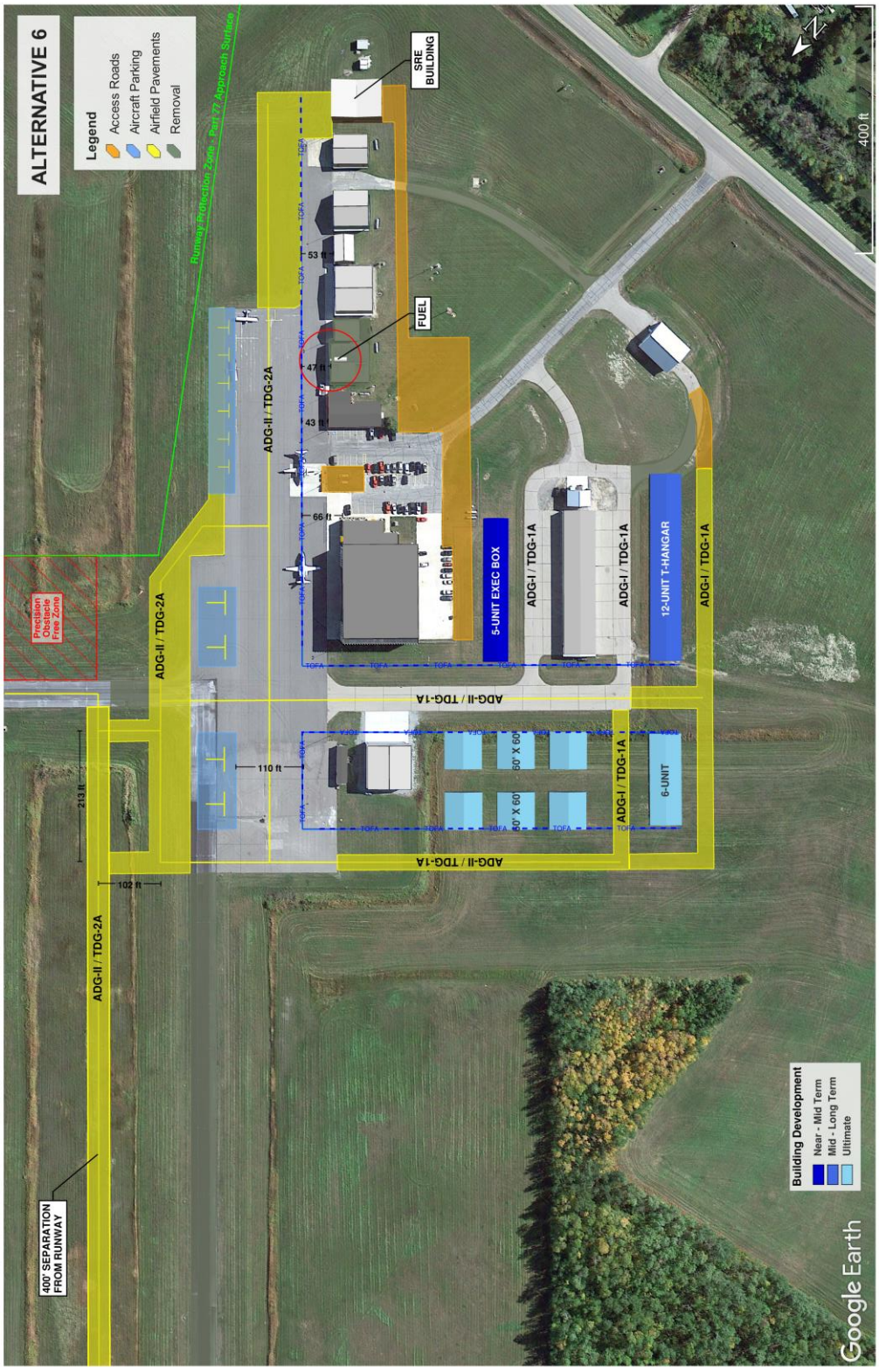
Warroad Airport Targeted Planning Study

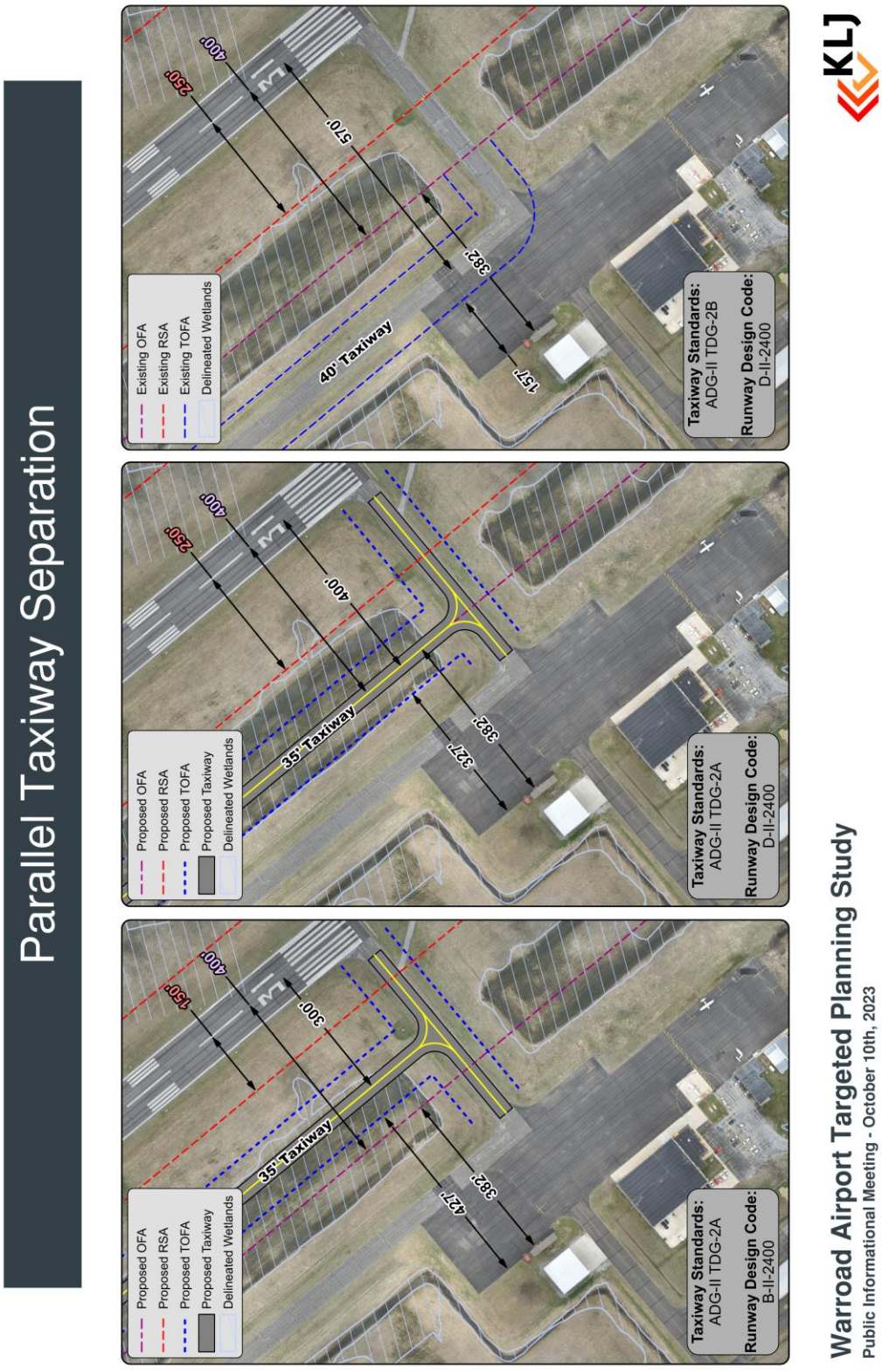
Planning Considerations



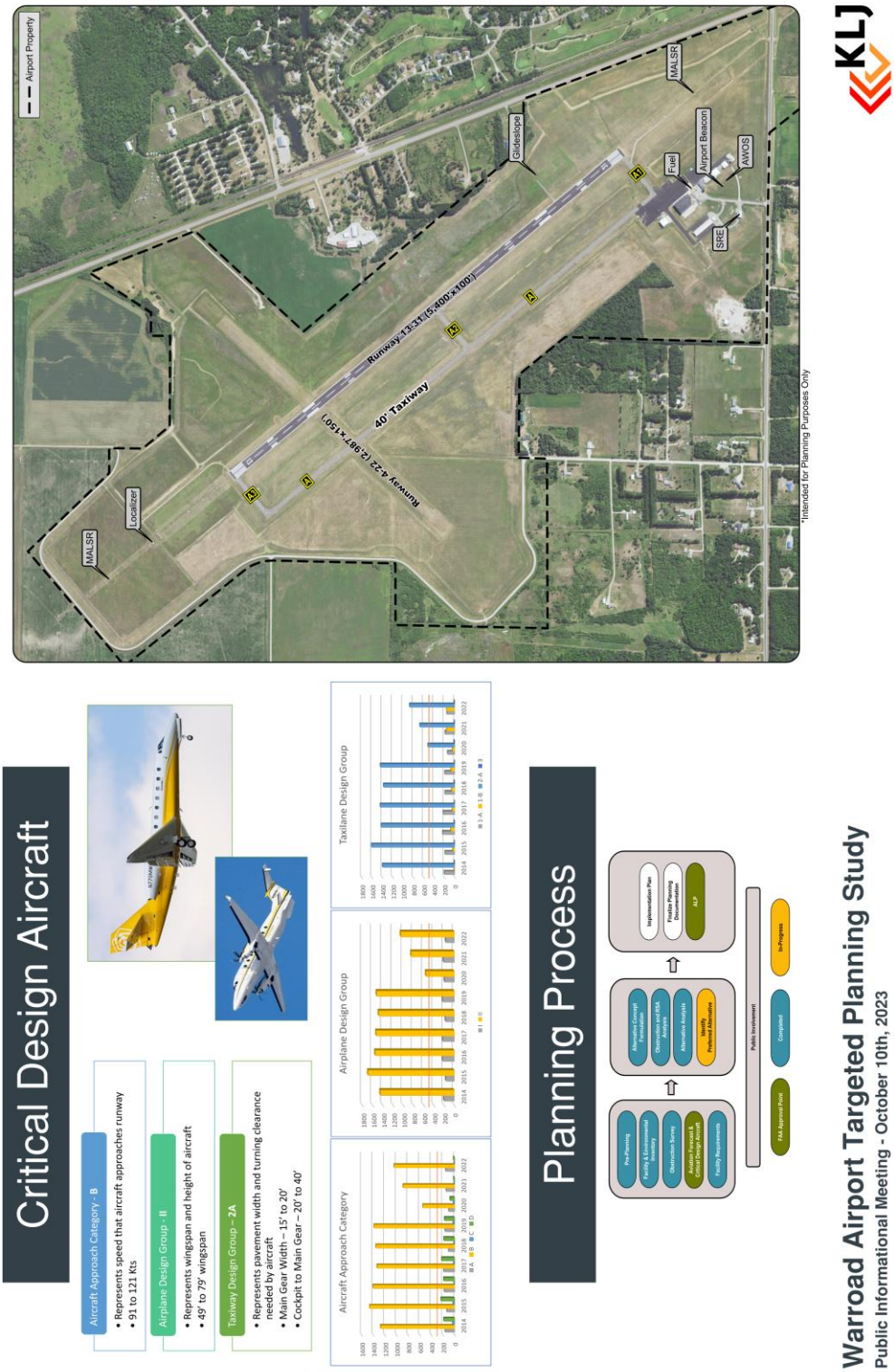
For more information, please visit https://warroad.airportplan.net/


ALTERNATIVE 5
Legend
Access Roads
Aircraft Parking
Airfield Pavements
Removal
Runway Protection Zone - Part 77 Approach Surface
Precision Obstacle Free Zone
FUEL
SRE BUILDING
100' X 100'
67 ft
55 ft
110 ft
90 ft
MARVIN HANGAR EXPANSION
60' X 60'
6-UNIT
ADG-II / TDG-2A
ADG-I / TDG-1A
50' X 50'
80' X 80'
12-UNIT T-HANGAR
50' X 50'
136 ft
130 ft
400' SEPARATION FROM RUNWAY
400 ft
Building Development
Near - Mid Term
Mid - Long Term
Ultimate
Google Earth

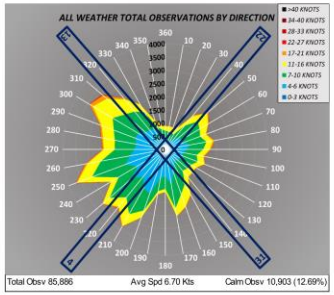

ALTERNATIVE 6
Legend
Access Roads
Aircraft Parking
Airfield Pavements
Removal
Runway Protection Zone - Part 77 Approach Surface
SRE BUILDING
FUEL
5-UNIT EXEC BOX
12-UNIT T-HANGAR
6-UNIT
ADG-II / TDG-2A
ADG-I / TDG-1A
400' SEPARATION FROM RUNWAY
Building Development
Near - Mid Term
Mid - Long Term
Ultimate
Google Earth


Parallel Taxiway Separation
Proposed OFA
Proposed RSA
Proposed TOFA
Proposed Taxiway
Delineated Wetlands
150'
400'
300'
35' Taxiway
427'
382'
Taxiway Standards:
ADG-II TDG-2A
Runway Design Code:
B-II-2400
Proposed OFA
Proposed RSA
Proposed TOFA
Proposed Taxiway
Delineated Wetlands
250'
400'
400'
35' Taxiway
327'
382'
Taxiway Standards:
ADG-II TDG-2A
Runway Design Code:
D-II-2400
Existing OFA
Existing RSA
Existing TOFA
Delineated Wetlands
250'
400'
570'
40' Taxiway
382'
157'
Taxiway Standards:
ADG-II TDG-2B
Runway Design Code:
D-II-2400
Warroad Airport Targeted Planning Study
Public Informational Meeting - October 10th, 2023
KLJ

Public Open House Continued – October 2023



Wind Analysis



ALL-WEATHER WIND COVERAGE			
CONFIGURATION	CROSSWIND COMPONENT		
	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 13-31	93.50%	97.56%	99.37%
RUNWAY 4-22	92.19%	96.85%	99.06%
COMBINED	99.29%	99.84%	99.98%

SOURCE: KRRT AWOS (2009-2018, HOURLY) FROM NATIONAL CLIMATIC DATA CENTER
85,886 TOTAL OBSERVATIONS

INSTRUMENT FLIGHT RULES (IFR) WIND COVERAGE			
CONFIGURATION	CROSSWIND COMPONENT		
	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 13-31	90.87%	95.95%	98.70%

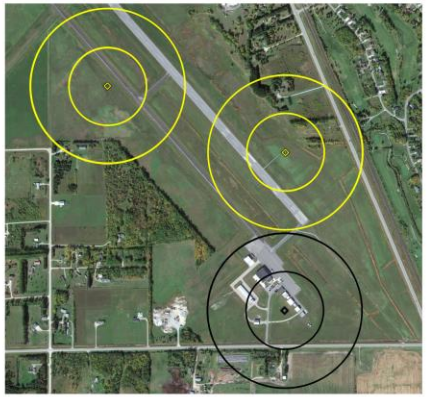
SOURCE: KRRT AWOS (2009-2018, HOURLY) FROM NATIONAL CLIMATIC DATA CENTER
7,358 TOTAL OBSERVATIONS
IFR = VISIBILITY LOWER THAN 3 MILES OR CEILING LOWER THAN 1,000 FEET

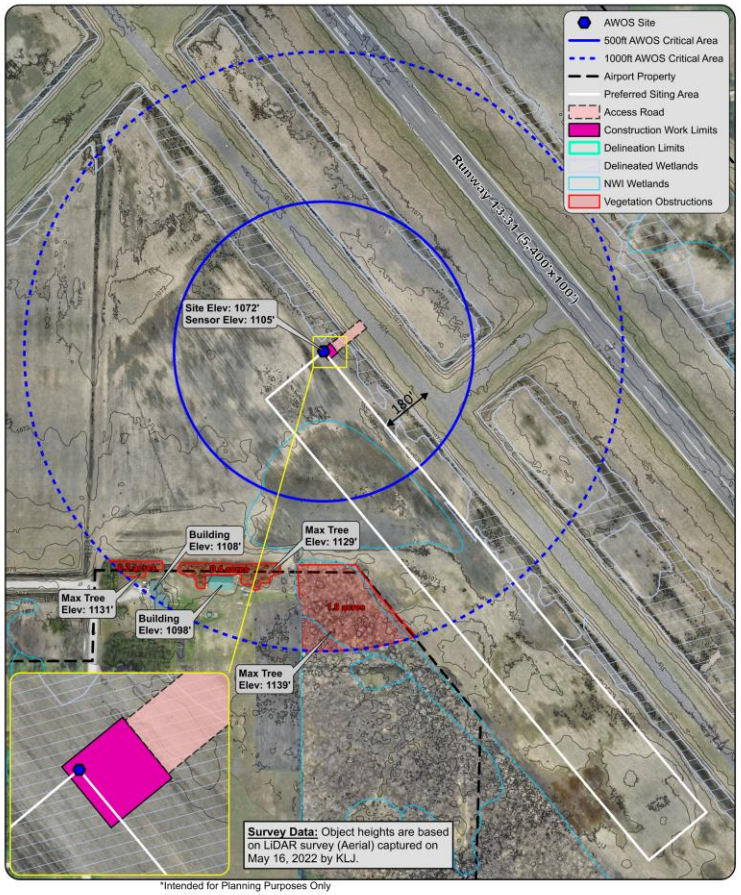
Table B-1. Allowable Crosswind Component per Runway Design Code (RDC)

RDC	Allowable Crosswind Component
A-I and B-I *	10.5 knots
A-II and B-II	13 knots
A-III, B-III, C-I through D-III D-I through D-III	16 knots
A-IV and B-IV, C-IV through C-VI, D-IV through D-VI	20 knots
E-I through E-VI	20 knots

Note: * Includes A-I and B-I small aircraft.

AWOS Siting





*Intended for Planning Purposes Only

Warroad Airport Targeted Planning Study
Public Informational Meeting - October 10th, 2023

Warroad Airport Targeted Planning Study - Open House – Oct 10th, 2023

ATTENDANCE LIST

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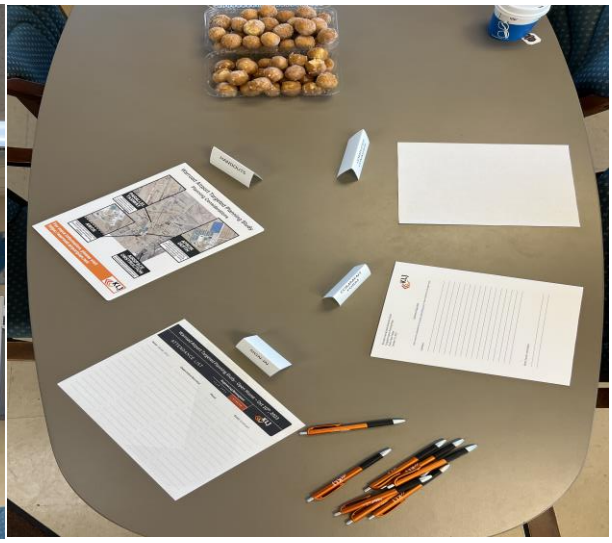
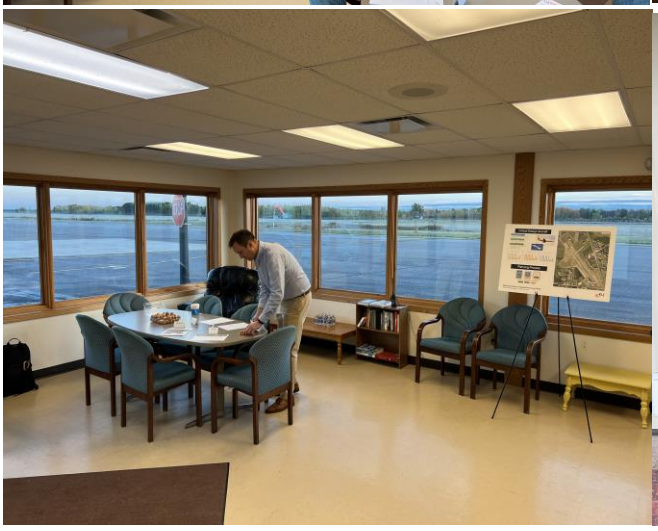
Name (please print)	Organization/Business	Phone	Email (optional)
Mike Burgad	Sky Skopes	701-321-2201	Mike Burgad@me.com

Public Open House Continued – October 2023






Warroad International Memorial Airport
Agency Meeting – April 30, 2024
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1


Agenda
Introductions
Facility Needs
Alternatives
Taxiway
Apron/Terminal Area
Implementation / Near-Term Projects
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2

Facility Needs

- Critical Design Aircraft
  - AAC-B, ADG-II, TDG-2A

- Remove direct access to runway
- Evaluate Taxiway to Runway separation distance to allow for more room around on aircraft parking apron
- Identify future location for the AWOS-III that meets current siting standards

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Facility Needs

- Apron sizing and layout should accommodate aircraft maneuvering, parking, and refueling
- Identify future location of fuel system
- Space for additional public and Marvin vehicle parking

Table 3-7 – Aircraft Parking Area Sizing

Category	*Existing*	Base	PAL 1	PAL 2	PAL 3	PAL 4
Transient Parking Tie-downs	*975*	6.5	7.0	7.5	8.1	8.7
Based Aircraft Parking Tie-downs	-	-	1.0	1.0	1.0	1.0
Aerial Firefighting Tie-downs	*1,600*	5.0	5.0	5.0	5.0	5.0
Total Equivalent Tie-downs (Rounded)		11.5 (12)	13.0 (13)	13.5 (14)	14.1 (14)	14.7 (15)
Total Parking Area (SY)	**2,575**	**3,924**	**4,251**	**4,578**	**4,578**	**4,905**
Capacity/(Deficiency) (SY)	-	**(1,349)**	**(1,676)**	**(2,003)**	**(2,003)**	**(2,330)**

Source: KLJ Analysis. Note: RED indicates a deficiency to existing capacity.

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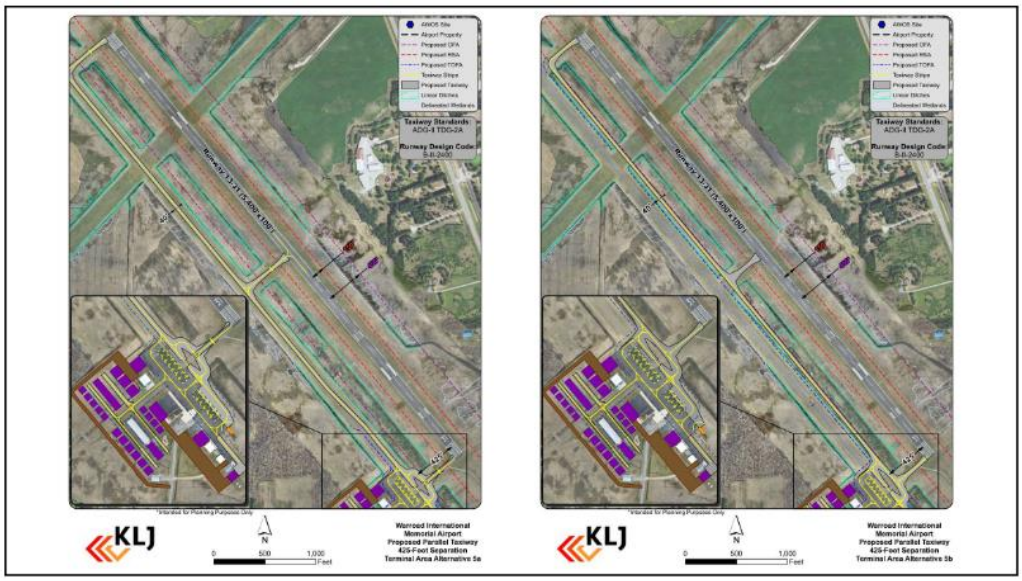

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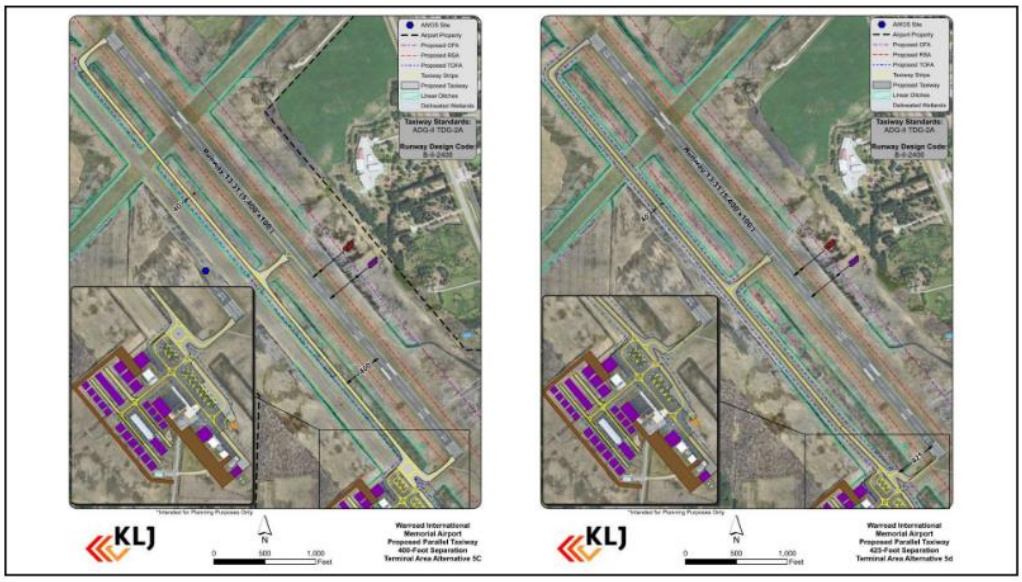

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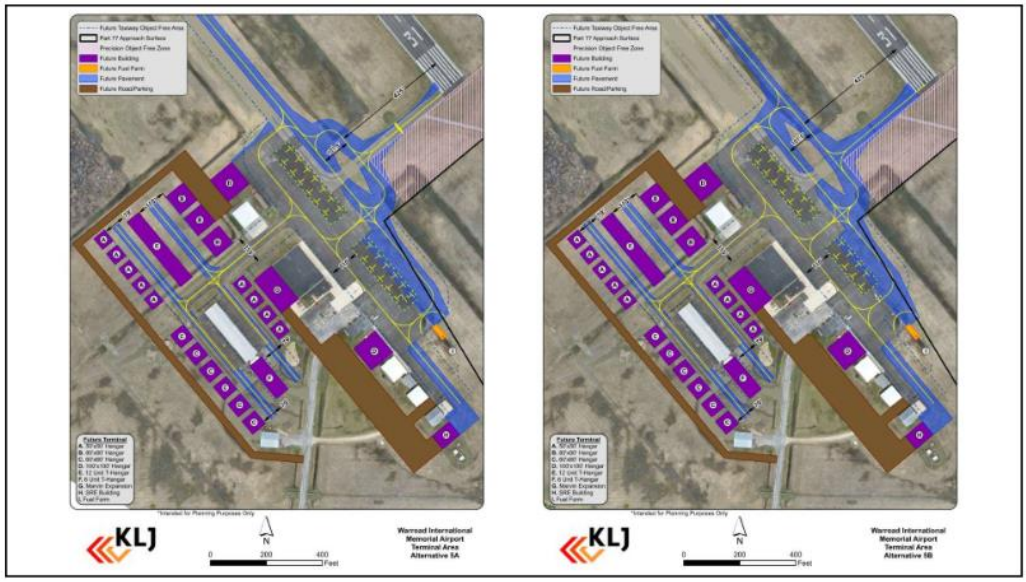

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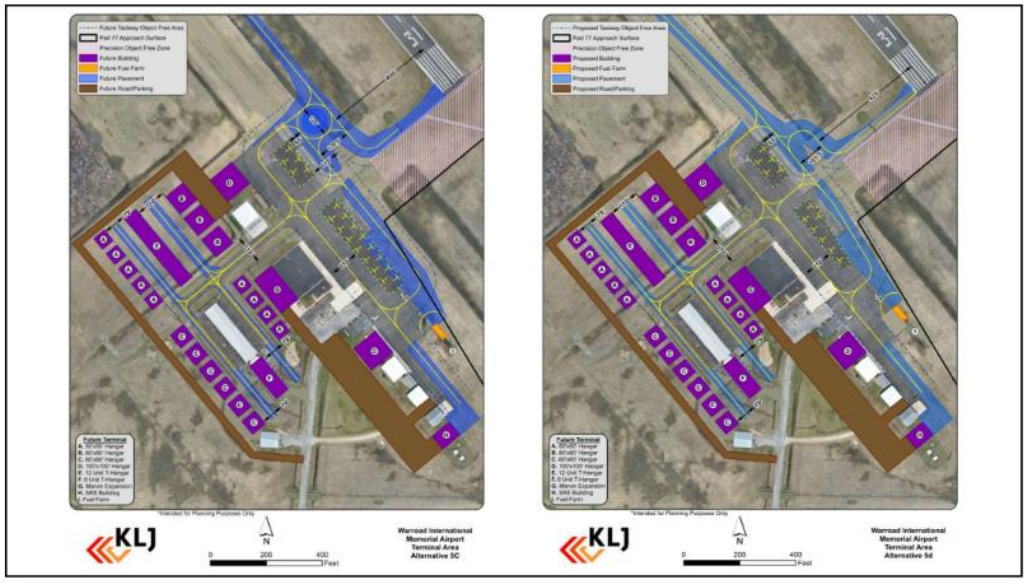

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Summary Table

Taxiway and Terminal Alternatives Summary Table

Metric	Alternatives			
	Alternative 5A	Alternative 5B	Alternative 5C	Alternative 5D
Taxiway Configuration	Extended Tie-in to Existing Taxiway	Relocated Parallel Taxiway - 425' Separation	Relocated Parallel Taxiway - 400' Separation	Immediate Tie-in to Existing Taxiway
Penetrate Runway Protection Zone	Yes	Yes	Yes	No
Penetrate Precision Obstacle Free Zone	Yes	Yes	No	No
Refueling Area Inside TLOFA	Yes	No	No	No
Tiedowns / Parking Area	24 Tiedowns (4,600 SY)	21 Tiedowns (4,400 SY)	20 Tiedowns (4,030 SY)	12 Tiedowns (2,800 SY)
Apron Expansion (NW) Considerations	Potential Taxiway Regrading May be Needed	Taxiway Does Not Impede Apron Expansion	Taxiway Does Not Impede Apron Expansion	Reconstruction of Taxiway Tie-in Will be Needed
Water Resource Impacts - Linear Ditch	0.59 Acres	6.01 Acres	5.41 Acres	0.30 Acres
Anticipated Environmental Documentation	CATEX	EA	EA	CATEX
Total Estimated Cost	**$6,510,000***	**$6,635,000**	**$6,495,000**	**$5,810,000****

Source: KLJ Analysis.
**$3,485,000 – If existing taxiway is mill and overlay rehabilitation instead of limited frost protection reconstruction*
*** $2,770,000 – If existing taxiway is mill and overlay rehabilitation instead of limited frost protection reconstruction*

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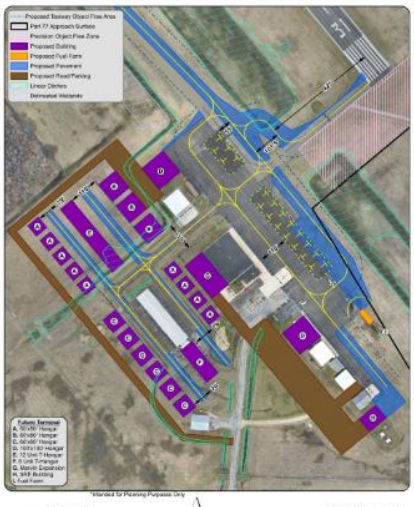

Preferred

- Preliminary – Airport in discussion with users
- Combines taxiway and direct access from 5D with apron area of 5C
- Minimize wetland impact and best utilization of apron pavement

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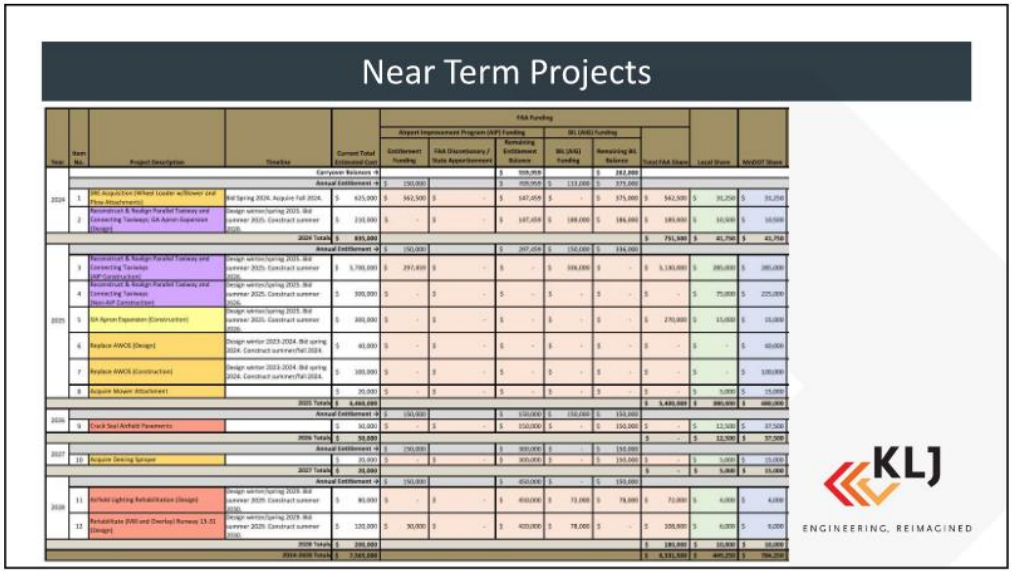
Near Term Projects
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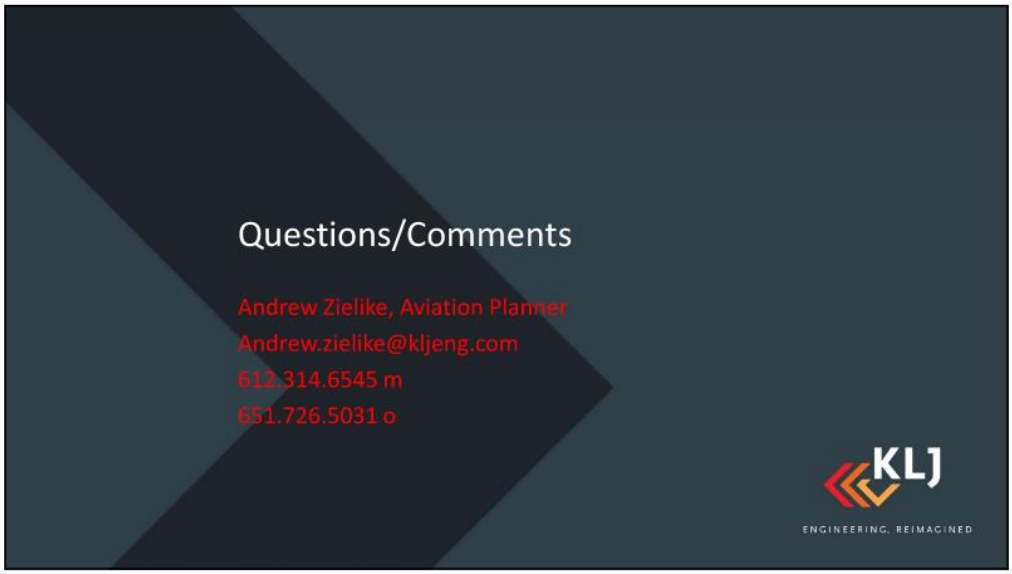
Questions/Comments
Andrew Zielike, Aviation Planner
Andrew.zielike@kljeng.com
612.314.6545 m
651.726.5031 o
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Meeting Minutes

Date: 4/30/2024 **Facilitator:** Andrew Zielike
Time: 2:00PM **Minutes:** Agency Meeting
Attendees: Kevin Carlson, Marcus Watson, Alexandra Courtney, Jared Wedel, Melissa Jenny, Arika Johnson, Matthew Lebens, Jeremy McLeod, Curt Cady, John Glesne, Andrew Zielike, Jack Vogt

Agenda Topics

Facility Needs

1. Reviewed Critical Design Aircraft: AAC-B, ADG-II, TDG-2A
2. Overview of Facility Needs
    a. Removal of direct access from apron to runway.
    b. Taxiway to runway separation distance to allow more apron depth with least amount of environmental impact
    c. Future AWOS location
    d. Apron layout for ADG-II/TDG-2A aircraft maneuvering
    e. Increase aircraft parking
    f. Increase vehicle parking
3. Marcus Watson, FAA, said that their review of the forecast in Chapter 1 is not complete but noted that the TAF Comparison table should be updated to current TAF.

Alternatives Review

1. Reviewed Alternatives (5A, 5B, 5C, 5D) for parallel taxiway alignment and direct access to Runway 31.
    a. Alternative 5A and 5D utilize existing taxiway minimizing wetland impacts while 5B and 5C have full length parallel at 425' and 400' separation. Airport prefers Alternative 5D for minimum development and least wetland impacts.
    b. FAA does not support taxiway going through the POFZ. Being that the airport is not uncontrolled hold short marking would not be as effective.
    c. Mellissa Jenny, FAA, noted that an EA would likely be triggered at a 3-acre threshold for wetland impacts (under Transportation Regional General Permit). Alternative 5A would be CATEX as it is below the 3-acre threshold.
    d. FAA would participate up to a taxiway width of 35' for TDG-2A standards. Matt Lebens said MnDOT does not require 40' width for Key GA airports but generally supports 40' width.

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e. FAA requested phased development plan to show how direct runway access removal will be implemented with the taxiway and apron. Conflict resolution with aircraft movement should be evaluated in phased development with single runway access.

2. Reviewed Alternatives (5A, 5B, 5C, 5D) for apron area.
   a. Alternatives 5A, 5B, and 5C have dual taxilanes layouts which penetrate the RPZ, Part 77 Approach Surface and MnDOT Clear Zone. Alternative 5D remains outside of these surfaces at the expense to available aircraft parking. The Airport prefers Alternative 5C.
   b. Watson, FAA, said using a reasonable tail height of critical aircraft, the sponsor needs to submit the preferred alternative through an airspace study for further evaluation for the Approach Surface penetration.
   c. FAA expects RPZ alternatives and evaluation as part of planning study narrative. Document issues such as proximity of parking to terminal, impacts to parking space operations by large aircraft (DNR). Land Use Compatibility AC provides prescriptive details on how RPZ alternatives should be evaluated.
   d. Kevin Carlson, MnDOT, stated that the airport zoning ordinance may prohibit the taxilane in safety zone A and a waiver may be needed.
3. Preferred Alternative
   a. Airport's preferred alternative was discussed combining taxiway components of 5D and apron components of 5C.
   b. To improve cockpit visibility of apron taxilane, KLJ recommended revising alternative to shift 90-degree turns in taxilane to a 400' separation from the runway versus 425'.

Implementation and Near-Term projects

1. Watson, FAA, said that planning complete (approved ALP) will be checkpoint to proceed to design. Jeremy McLeod, FAA, expects FY2025 grant for design and environmental documentation.

Action Items

1. KLJ will revise Preferred Alternative with Taxiway A1 shifted to 400' separation and submit for airspace study.

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