

Warroad International Memorial Airport

Targeted Airport Planning Meeting #4 – October 10, 2023



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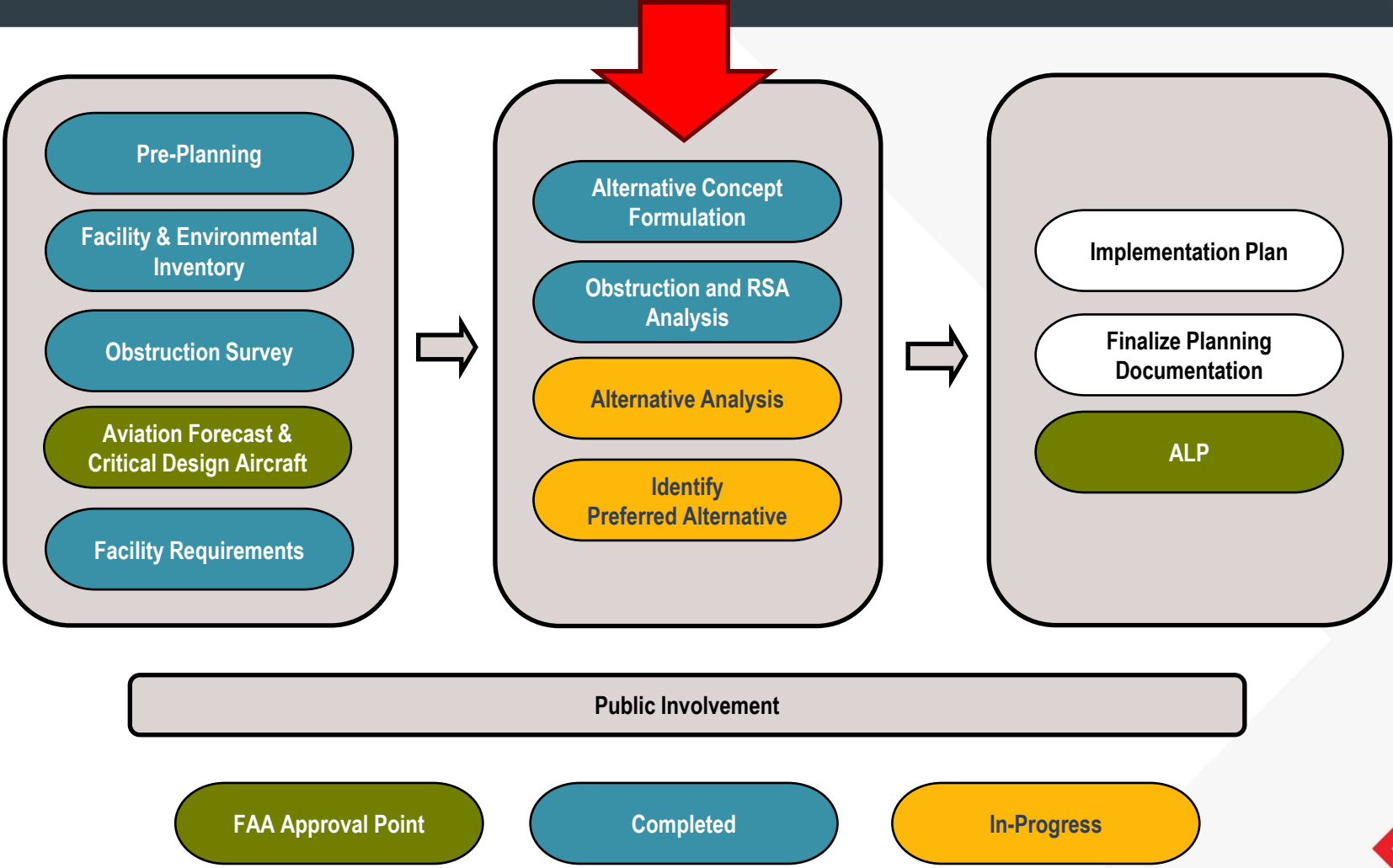
Agenda

- Introductions
- Progress to Date
- AWOS Siting Update
- Alternative Considerations
- Alternatives
- Questions/Comments



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Process to Date



Progress To Date

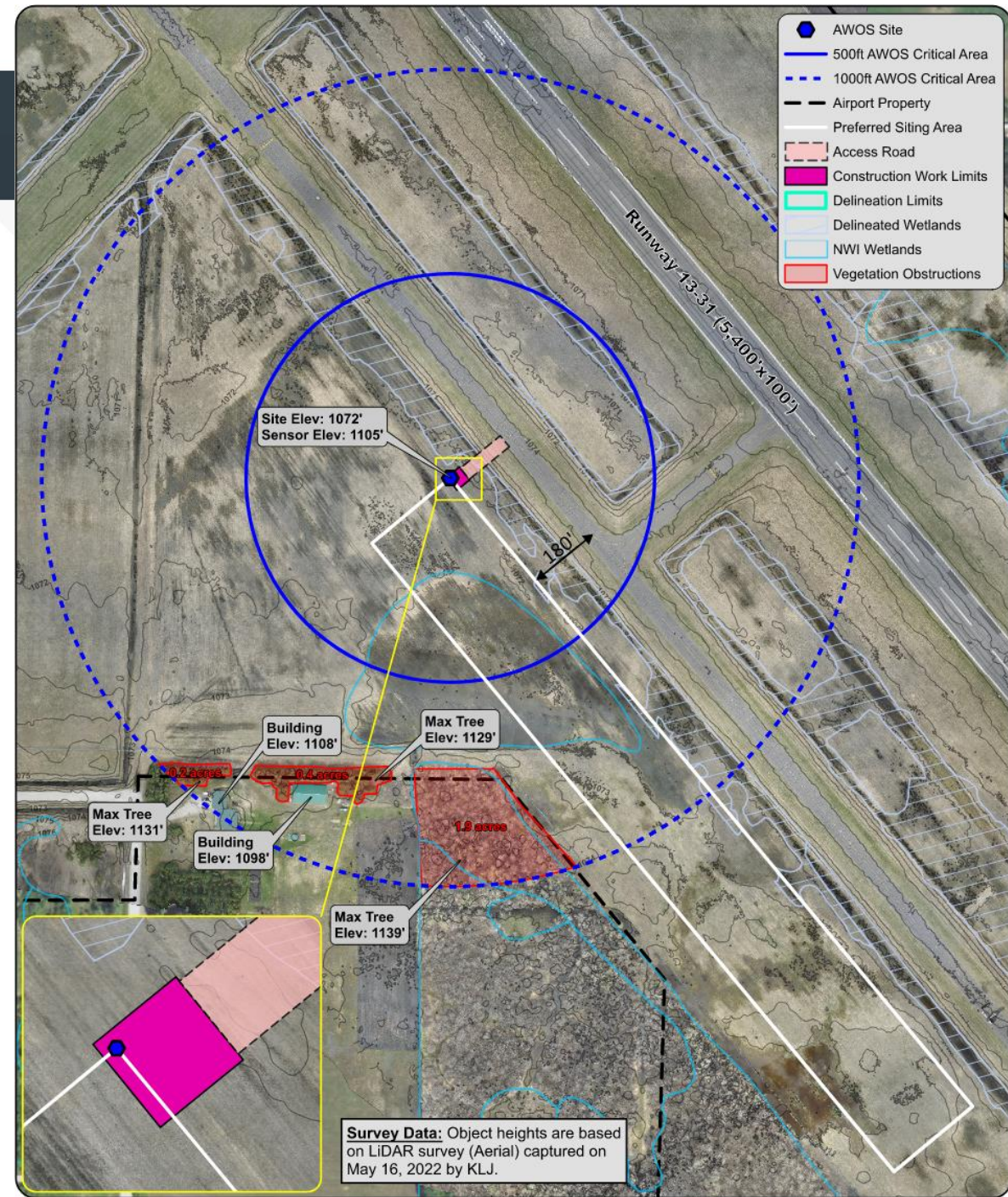
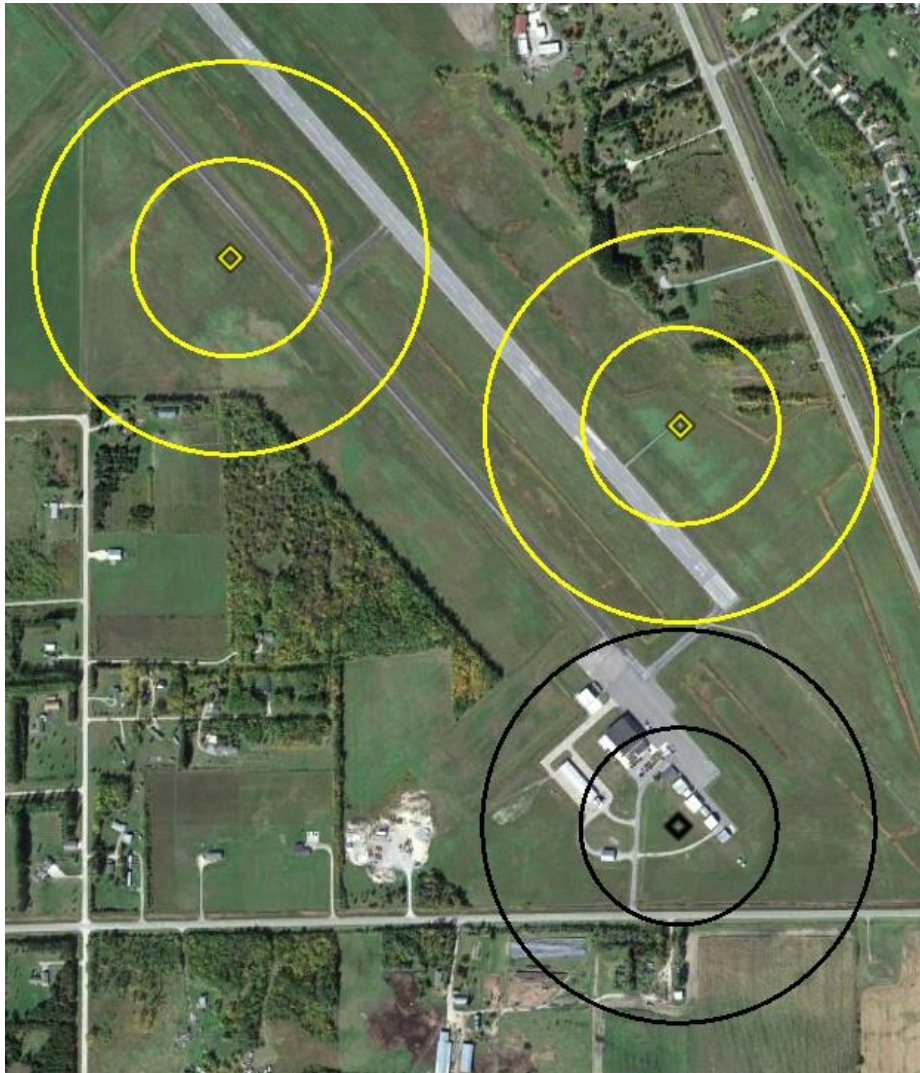
- Refined and drafted new alternatives
- FAA Briefing
- Wetland Jurisdictional Determination
 - Agency Meeting with ACOE
 - Results needed to finalize parallel taxiway layout
- Discussions on future fleet mix
- Public Information Meeting



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AWOS Siting

Siting Options



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'



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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ALTERNATIVE 5

Legend

- Access Roads
- Aircraft Parking
- Airfield Pavements
- Removal

400' SEPARATION FROM RUNWAY

Precision Obstacle Free Zone

FUEL

Runway Protection Zone - Part 77 Approach Surface

ADG-II / TDG-2A

ADG-II / TDG-2A

ADG-II / TDG-2A

80' X 80'

ADG-II / TDG-2A

12-UNIT T-HANGAR

ADG-I / TDG-1A

50' X 50'

ADG-II / TDG-2A

MARVIN HANGAR EXPANSION

60' X 60'

ADG-I / TDG-1A

6-UNIT

ADG-I / TDG-1A

50' X 50'

100' X 100'

SRE BUILDING

Building Development

- Near - Mid Term
- Mid - Long Term
- Ultimate



ALTERNATIVE 6

Legend

- Access Roads
- Aircraft Parking
- Airfield Pavements
- Removal

400' SEPARATION FROM RUNWAY

Precision Obstacle Free Zone

Runway Protection Zone - Part 77 Approach Surface

ADG-II / TDG-2A

ADG-II / TDG-2A

ADG-II / TDG-2A

ADG-II / TDG-1A

ADG-II / TDG-1A

5-UNIT EXEC BOX

ADG-I / TDG-1A

ADG-I / TDG-1A

12-UNIT T-HANGAR

ADG-I / TDG-1A

60' X 60'

60' X 60'

ADG-I / TDG-1A

6-UNIT

FUEL

SRE BUILDING

Building Development

- Near - Mid Term
- Mid - Long Term
- Ultimate



Summary Table

Terminal Area Alternatives Summary Table

Metric	Terminal Area Alternatives	
	Alternative 5	Alternative 6
Key Elements	<ul style="list-style-type: none"> • Rectangular Apron • Dual Taxilane Maneuvering • Fuel System – Edge of Apron • 4 Large Tie-Downs • 13 Small Tie-Downs Nested • 22,200 SY* Apron Pavement 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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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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

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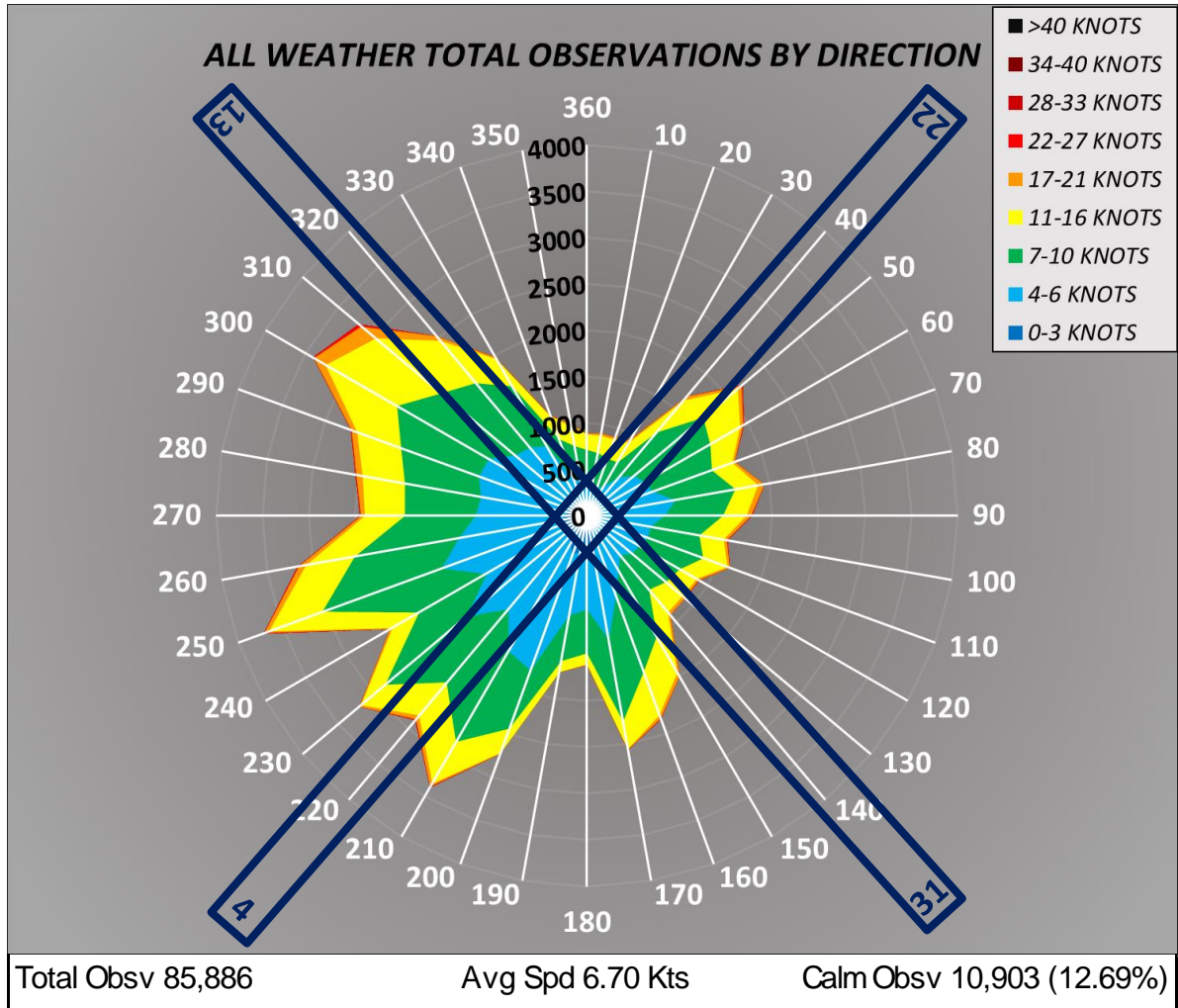
605.939.9535 m

605.872.5005 o



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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			

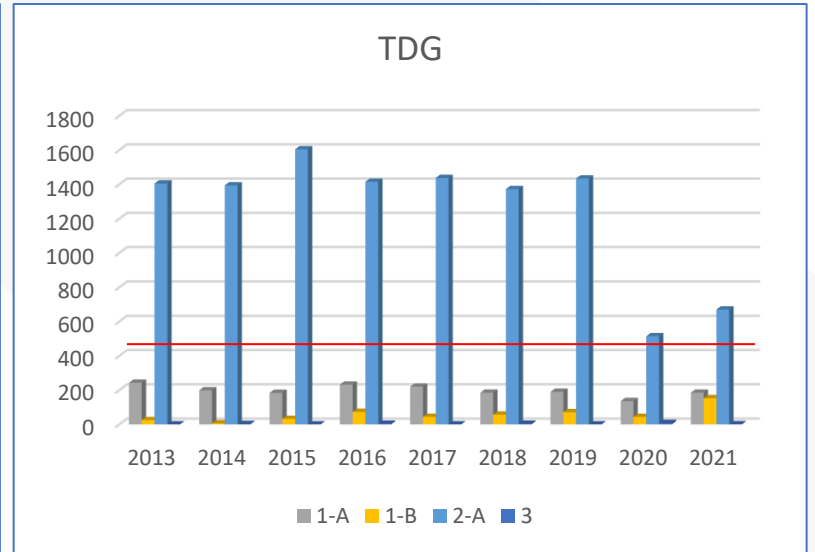
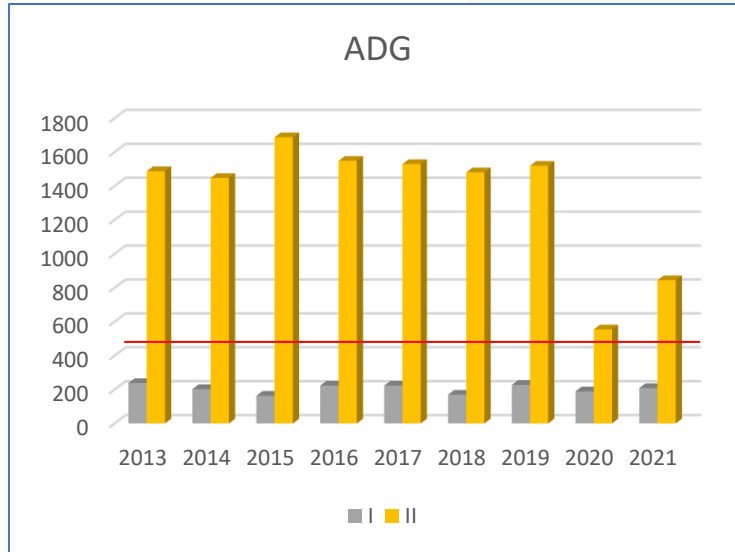
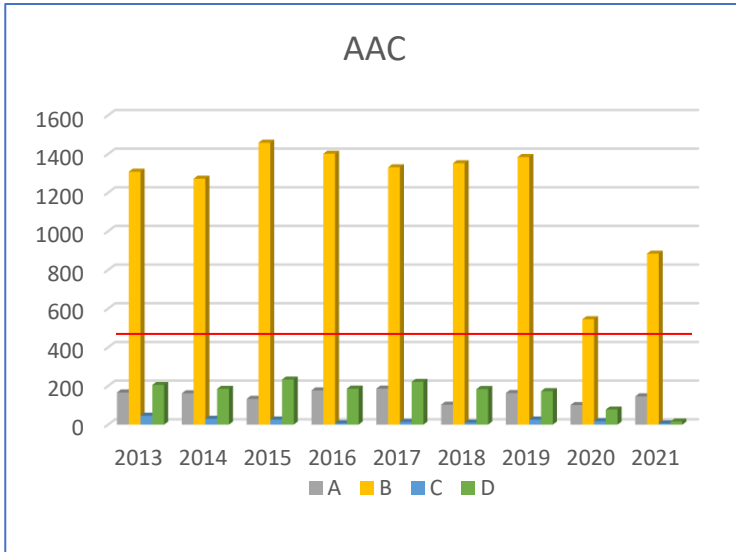
INSTRUMENT FLIGHT RULES (IFR) WIND COVERAGE			
CONFIGURATION	CROSSWIND COMPONENT		
	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 13-31	90.87%	95.95%	98.70%
SOURCE: KRRT AWOS (2009-2018, HOURLY) FROM NATIONAL CLIMATIC DATA CENTER 7,358 TOTAL OBSERVATIONS IFR = VISIBILITY LOWER THAN 3 MILES OR CEILING LOWER THAN 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	20 knots
E-I through E-VI	20 knots

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

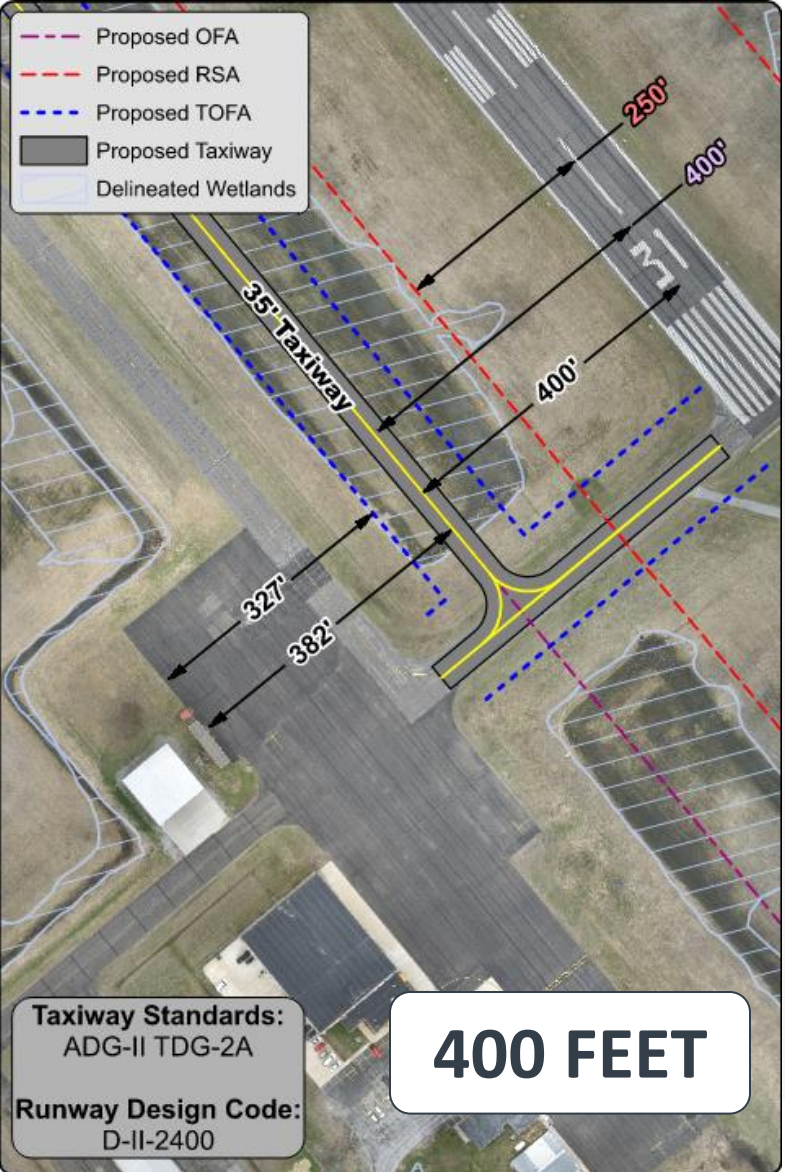
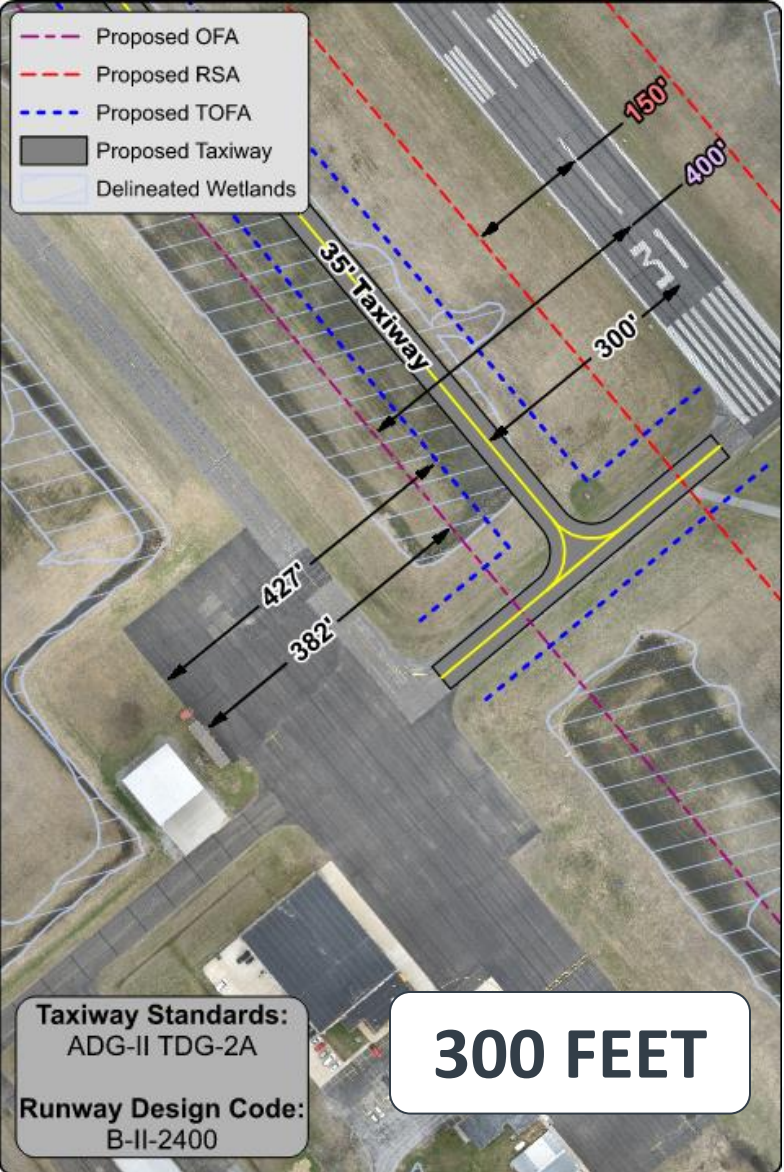
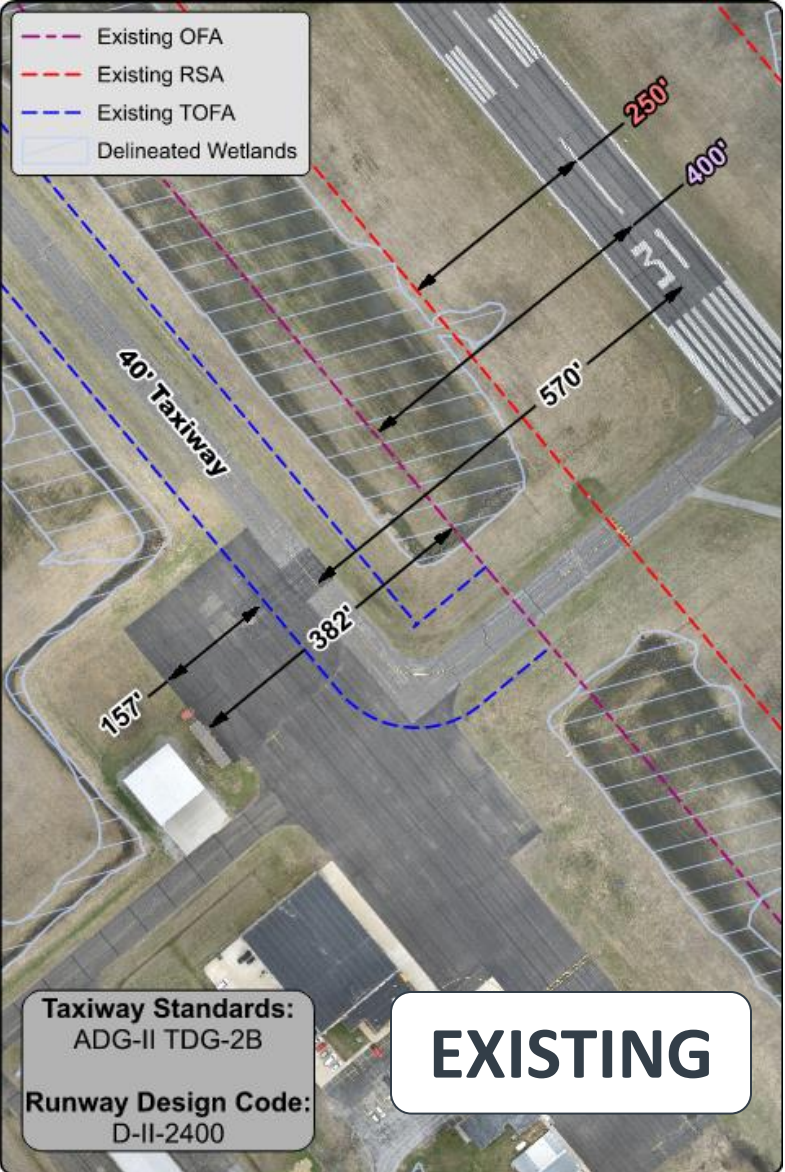
Critical Design Aircraft



- 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'



Parallel Taxiway Separation



EXISTING ALP

Legend

- Access Road
- Airfield Pavements
- Septic

FUEL

100' X 100'

ADG-I

12-UNIT T-HANGAR

ADG-I

12-UNIT T-HANGAR

ADG-I

12-UNIT T-HANGAR

10-UNIT T-HANGAR

ADG-I

60' X 60'

60' X 60'

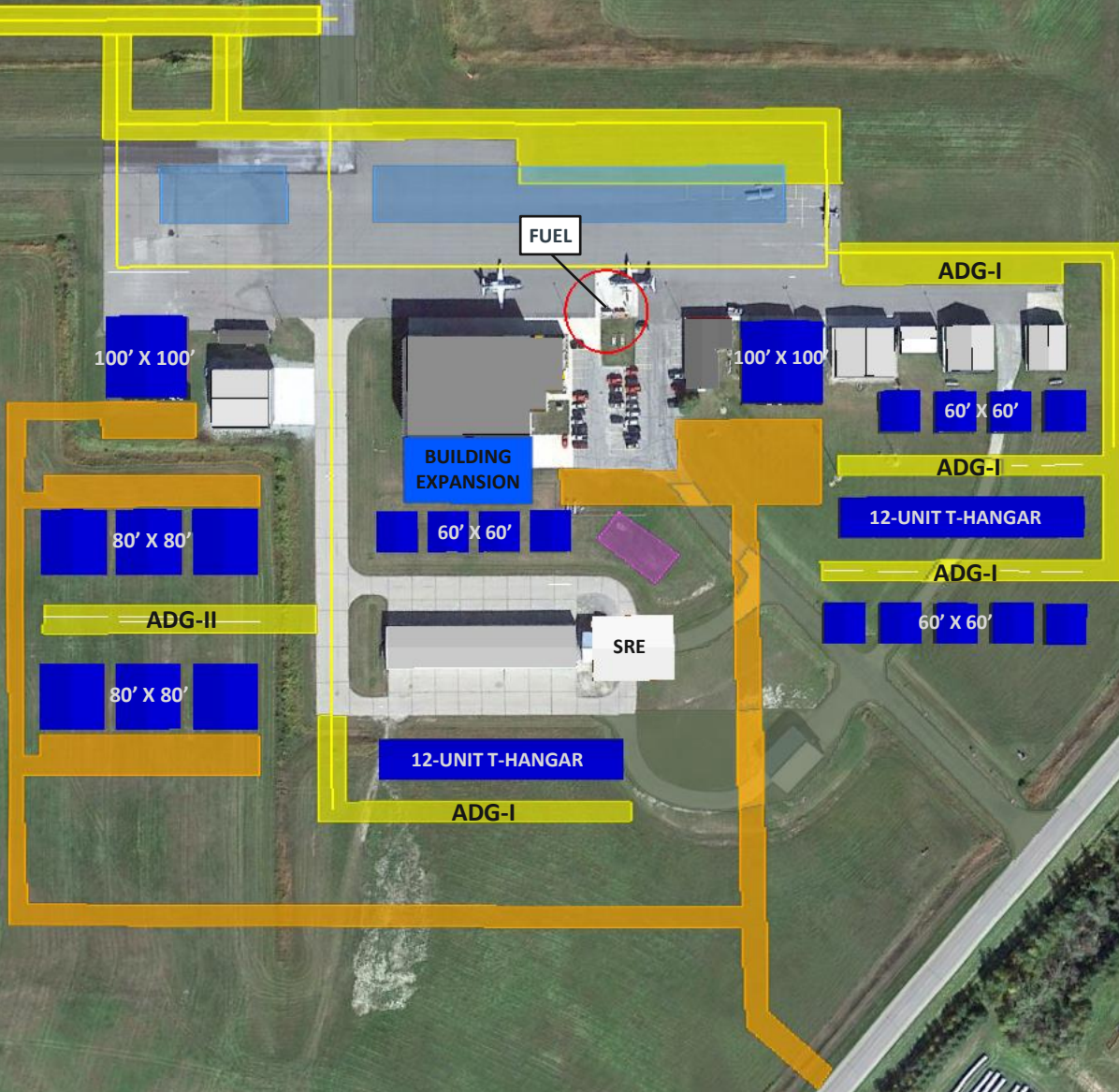
BUILDING EXPANSION



ALTERNATIVE 1

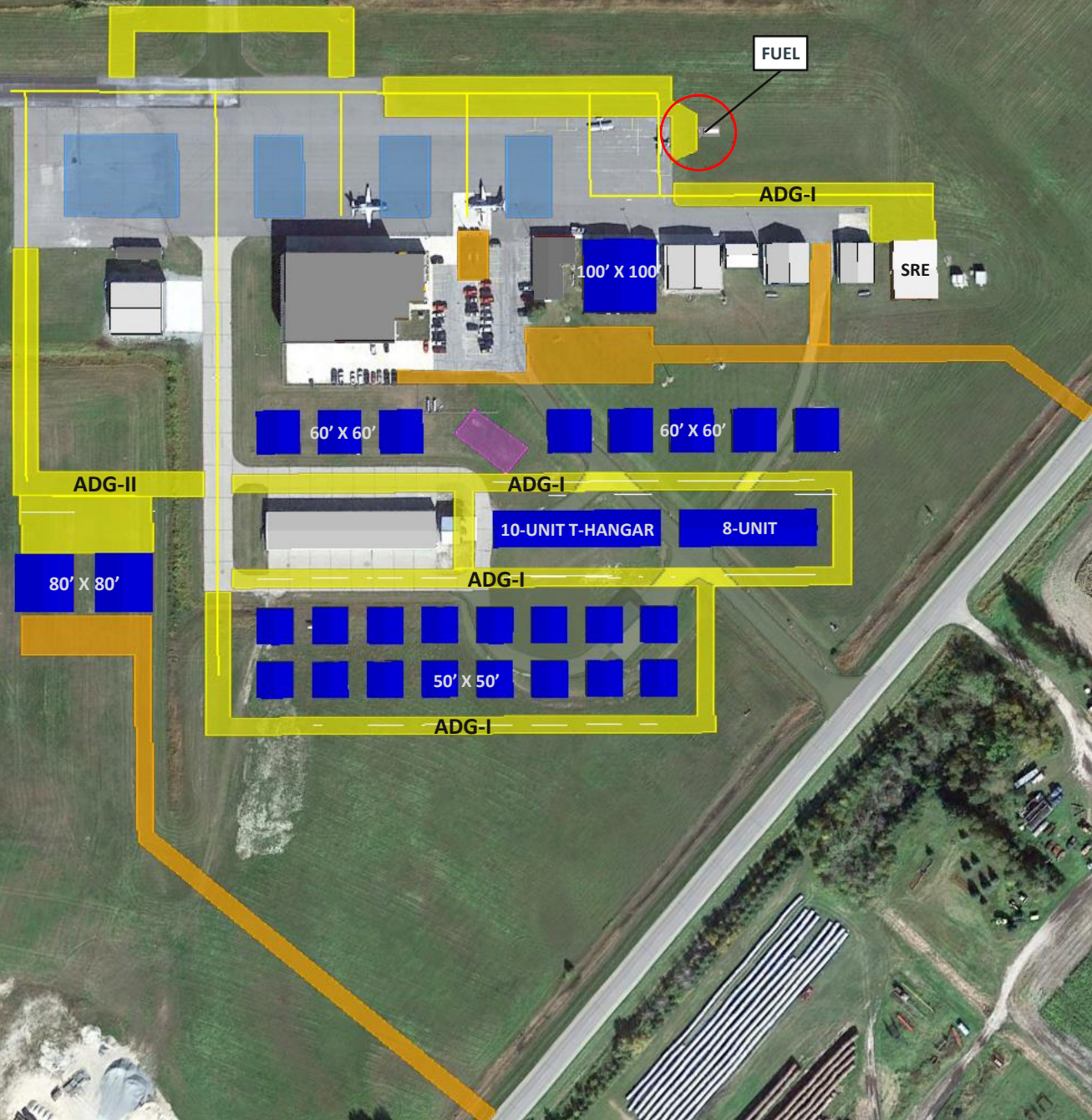
Legend

- Access Road
- Aircraft Parking
- Airfield Pavements
- Fuel Ring
- Septic



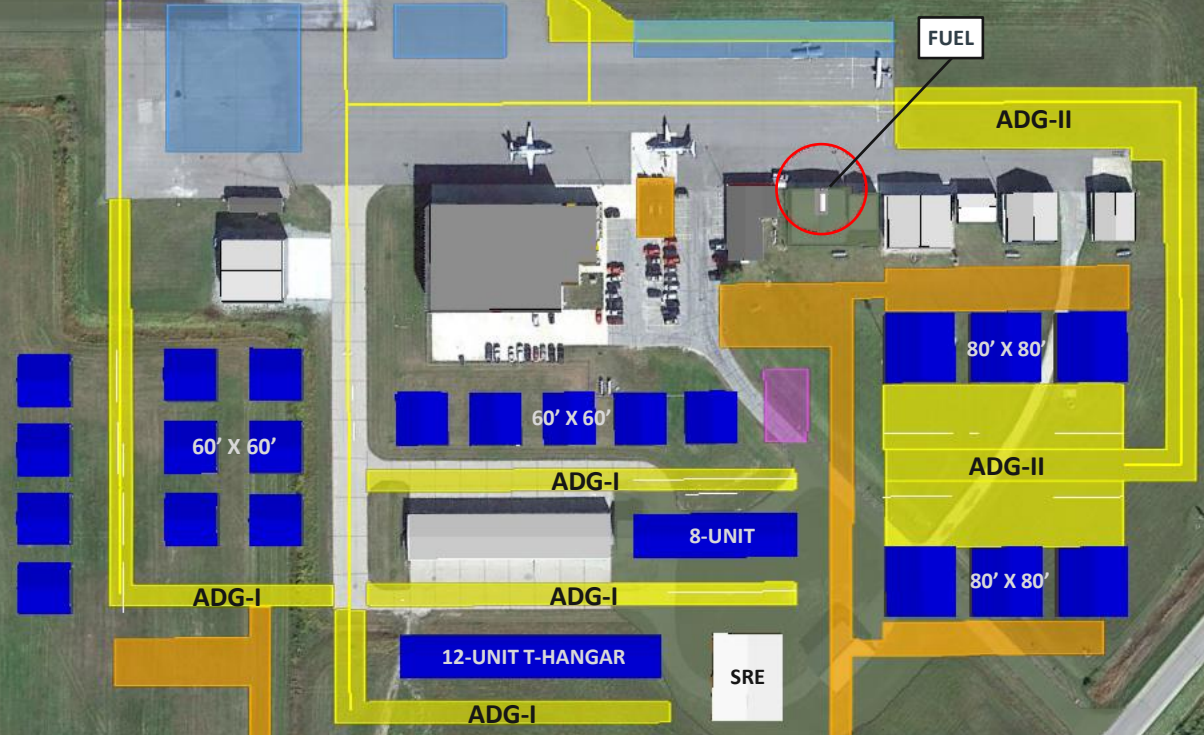
Legend

- Access Road
- Aircraft Parking
- Airfield Pavements
- Removal
- Septic



Legend

- Access Road
- Aircraft Parking
- Airfield Pavements
- Removal
- Septic



ALTERNATIVE 4

Legend

- Access Road
- Airfield Pavements
- Removal
- Septic

