

# Duluth Airport Master Plan

## Taxiway Network and Apron Parking Technical Advisory Committee (TAC) Meeting #5

December 2, 2020

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# Introductions

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# Meeting Agenda

- Taxiway design considerations
- Air Traffic Control Tower preliminary siting analysis
- Apron and building area layout alternatives

## Meeting Goals:

- Understand stakeholder views on highest and best use of certain areas
- Identify preferred layouts
- Identify flexible alternatives that can be adapted to other scenarios

# Taxiway Design Considerations

# TDG requirements by aircraft type

	Civilian Aircraft Requirements				UFC / Military Aircraft		
	TDG 2 <i>CRJ-700</i>	TDG 3 <i>A-319</i>	TDG 4 <i>MD-90</i>	TDG 5 <i>A-330</i>	Class A <i>UC-35</i>	Class B <i>F-16</i>	Class B <i>C-5</i>
Pavement Width	35'	50'	50'	75'	50'	75'	75'
Paved Taxiway Shoulder Required	No	Recommended	Yes	Yes	N/A <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>2</sup>
Paved Taxiway Shoulder Width	15'	20'	20'	30'	- <sup>1</sup>	10' <sup>1</sup>	25' <sup>2</sup>
<b>Total pavement width</b>	<b>65'</b>	<b>90'</b>	<b>90'</b>	<b>135'</b>	<b>50'</b>	<b>95'</b>	<b>125'</b>

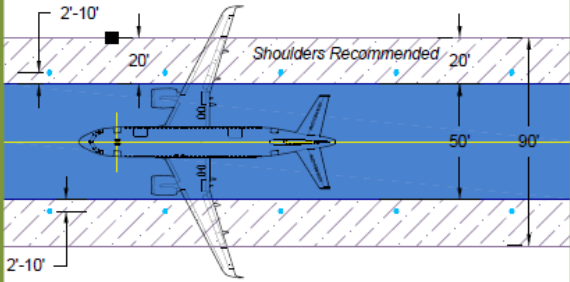
TDG 3 Eligible for FAA Funding

**Notes:**

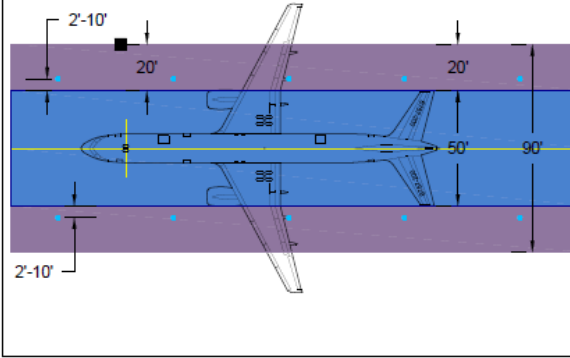
<sup>1</sup>Air Force taxiways devoted exclusively for fighter and trainer aircraft

<sup>2</sup>Army and Air Force airfields

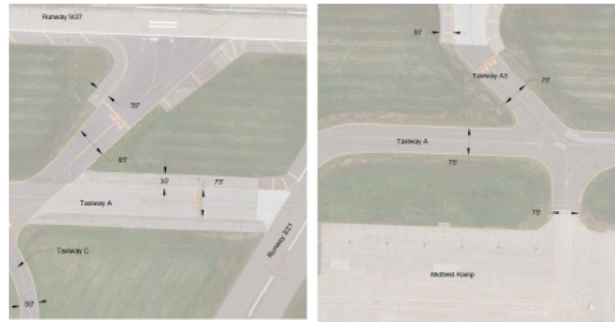
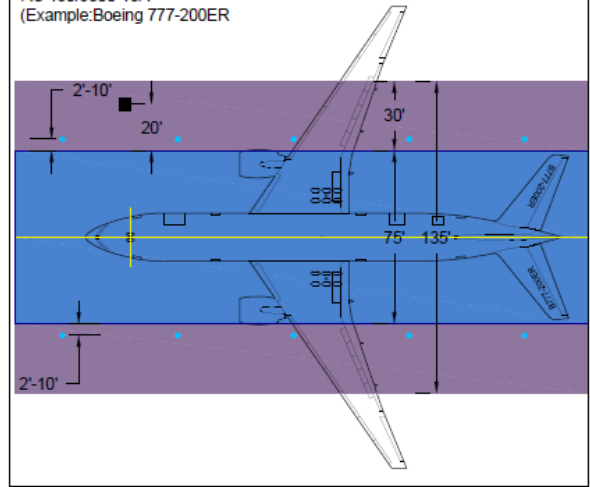
**TDG 3 (FAA Critical Aircraft)**  
 AC 150/5300-13A  
 (Example: A319 and A320 family)



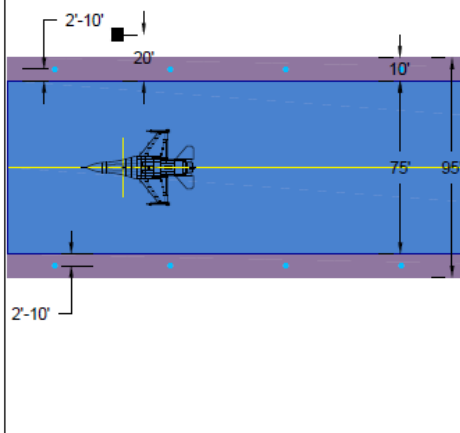
**TDG 4**  
 AC 150/5300-13A  
 Example: Boeing 757-200



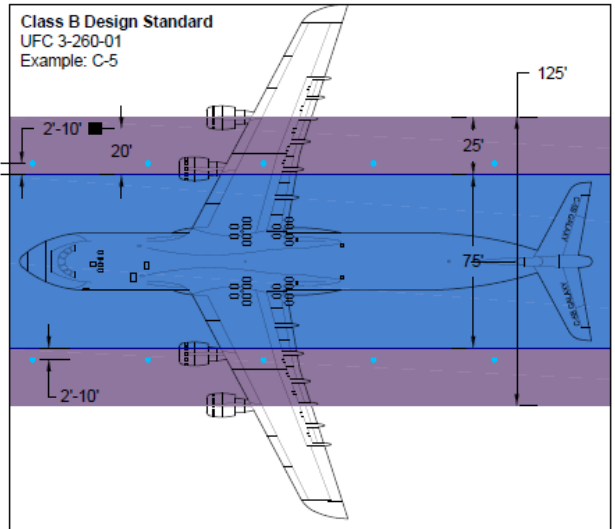
**TDG 5**  
 AC 150/5300-13A  
 (Example: Boeing 777-200ER)



**Class B Fighter Aircraft**  
 UFC 3-260-01  
 Example: F-16

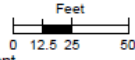


**Class B Design Standard**  
 UFC 3-260-01  
 Example: C-5



**Legend**

-  Required Taxiway Pavement
-  Recommended Shoulder Pavement
-  Required Shoulder Pavement
-  Taxiway Edge Light
-  Taxiway Sign (Size 1 or 2)



*TDG turn fillets vary with each TDG grouping*



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# Proposed Taxiway Design Standards

	Pavement Width	Shoulder Width	Accommodates
Taxiway A	75'	25'	Meets 148 <sup>th</sup> needs / exceeds critical aircraft
Runway 9/27 Connectors	75'	25'	Meets 148 <sup>th</sup> needs / exceeds critical aircraft
Taxiway C	50'	20'	Critical Aircraft (A319)
Runway 3/21 Connectors	50'	20'	Critical Aircraft (A319)
Taxiway D	75'	25'	Meets 148 <sup>th</sup> needs / exceeds critical aircraft
Taxiway F Network	75'	25'	Meets 148 <sup>th</sup> needs

A full-length Taxiway D alternative is still be evaluated and will continue to be considered

It is proposed Taxiway C be designed to the standards of the Critical Aircraft (A319). Larger aircraft will be required to back-taxi on Runway 3/21 to the Guard Ramp

# Air Traffic Control Tower Siting Alternatives and Analysis



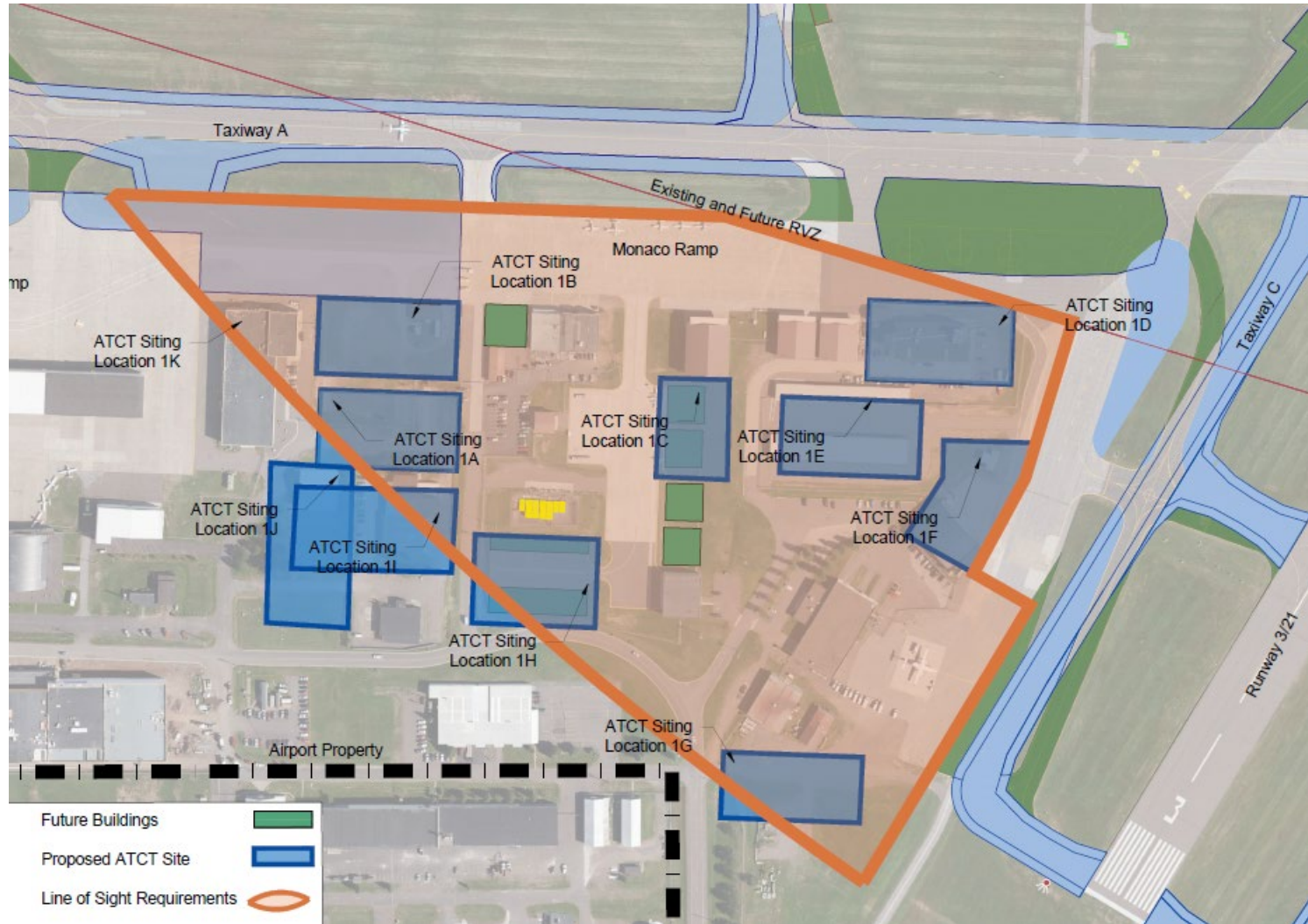
# Air Traffic Control Siting Criteria

- Limit potential impacts on instrument approaches and their protected surfaces
- Limit impacts on potential communication, navigation and surveillance equipment
- Unobstructed view of all movement area
  - Visibility of all airport surface areas for ground operations of ramps, aprons and tie-down areas and test areas must be considered. Priority must be given to visibility of taxi lanes in non-movement areas.

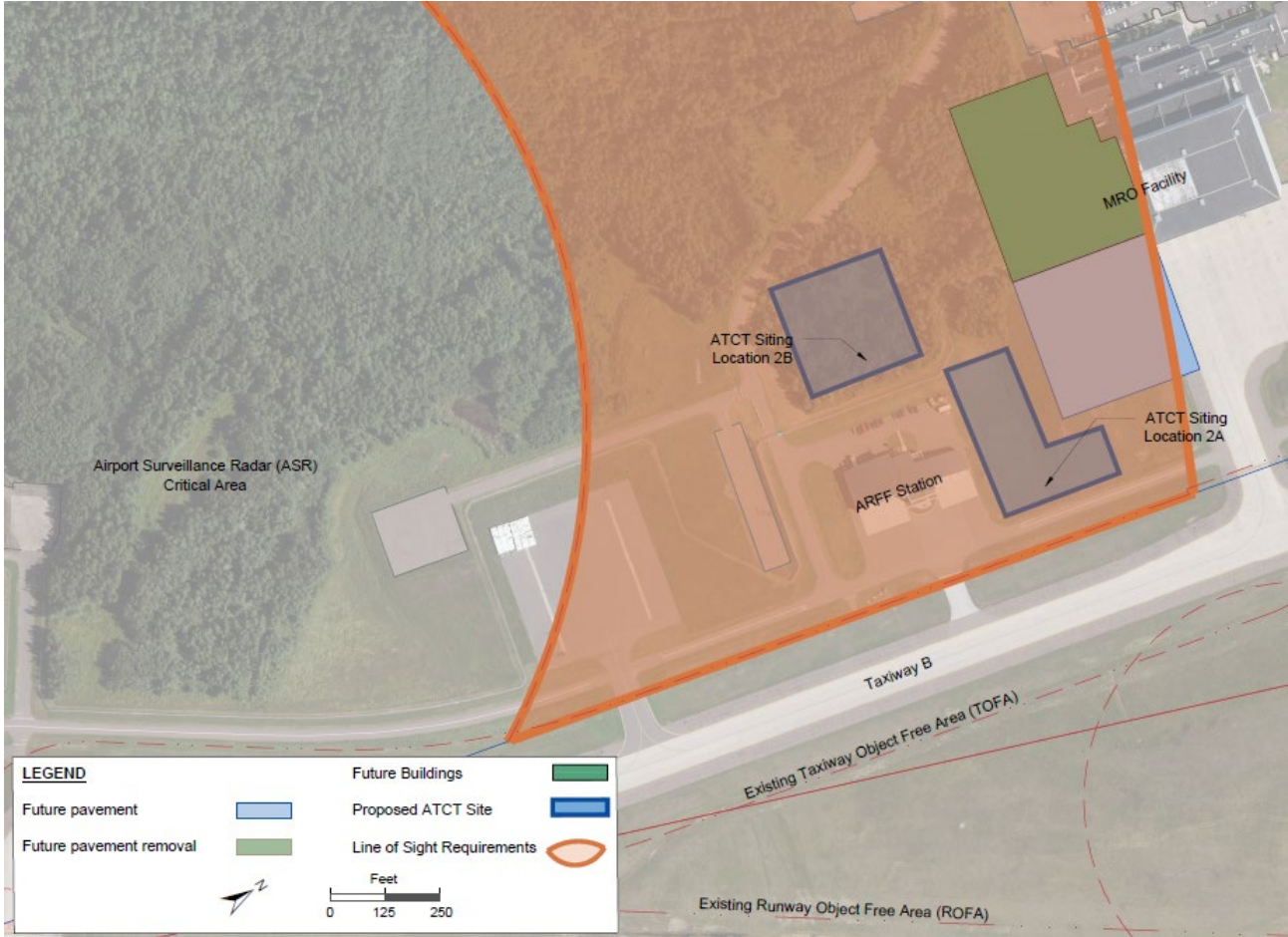
# Air Traffic Control Siting Criteria

- Control Tower Orientation
  - Must be orientated where the primary view faces north or alternately east, west and finally south
  - In areas where snow accumulates or the ATCT site is surrounded by sand or a large body of water, a southern orientation should be avoided.
  - Airport surfaces
- Economic considerations
  - Height, utilities, site access, etc.
  - Limit impacts to potential development and redevelopment sites
- *FAA will have final say on placement and ultimate height of ATCT based on their analysis and operational requirements when the project is ready to be implemented.*

# Preliminary Tower Sites – SW Quadrant



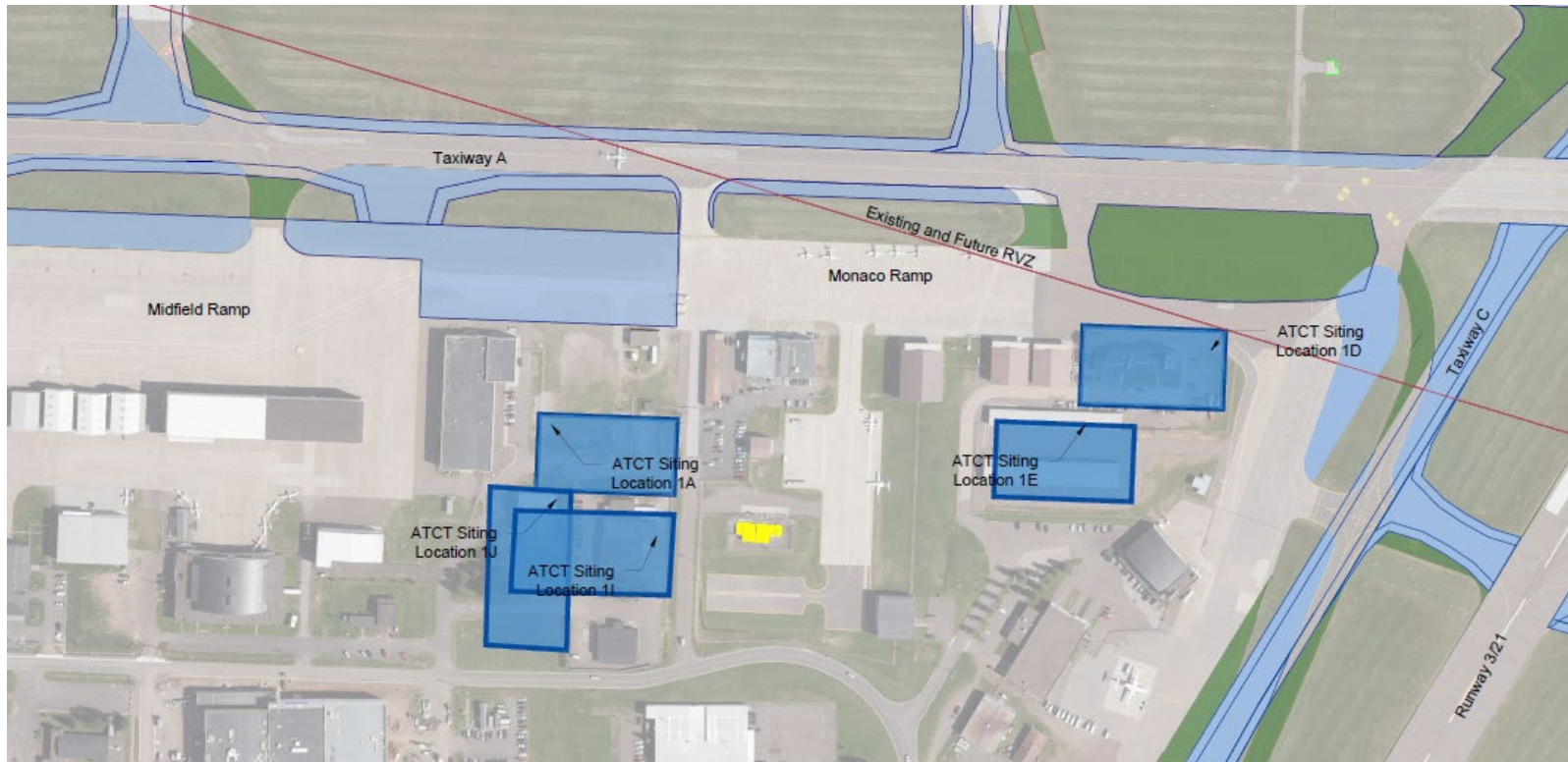
# Preliminary Tower Sites – NW Quadrant





# Most Preferred ATCT Alternatives

## Alternatives 1A, 1D, 1E, 1I, 1K



# Preliminary building area layouts

# Aeronautical Building Area Needs

- ~25 tiedowns
- Designated helicopter area
  - 3 to 4 helicopter parking spots
  - Large box hangar(s)
- Group development by use and similar sized aircraft
- Remove aircraft parking in Runway Visibility Zone (RVZ)
- Eliminate existing ATCT line of sight challenges and avoid future line of sight limitations
- Aeronautical manufacturing expansion space
- Larger hangars
- Ranch and T-hangars

# Based and Transient Tiedown Needs

- Current Tiedowns
  - Fixed wing ~ 16
  - Helicopter – 3 (Tower Ramp and in the RVZ)
  - *Totals do not include Midfield Ramp or paved area south of Monaco that are used for tiedowns*
- Tiedown Facility Recommendations:
  - ~ 25 (Primarily ADG II with some ADG III)
    - Annual operations
    - Peak hour of transient and based aircraft operations
    - Includes non-air carrier commuter operations and non-FedEx cargo operations
    - Tiedown need stays relatively consistent through planning period
  - Large aircraft (ADG IV and V) parking options



# Based Aircraft

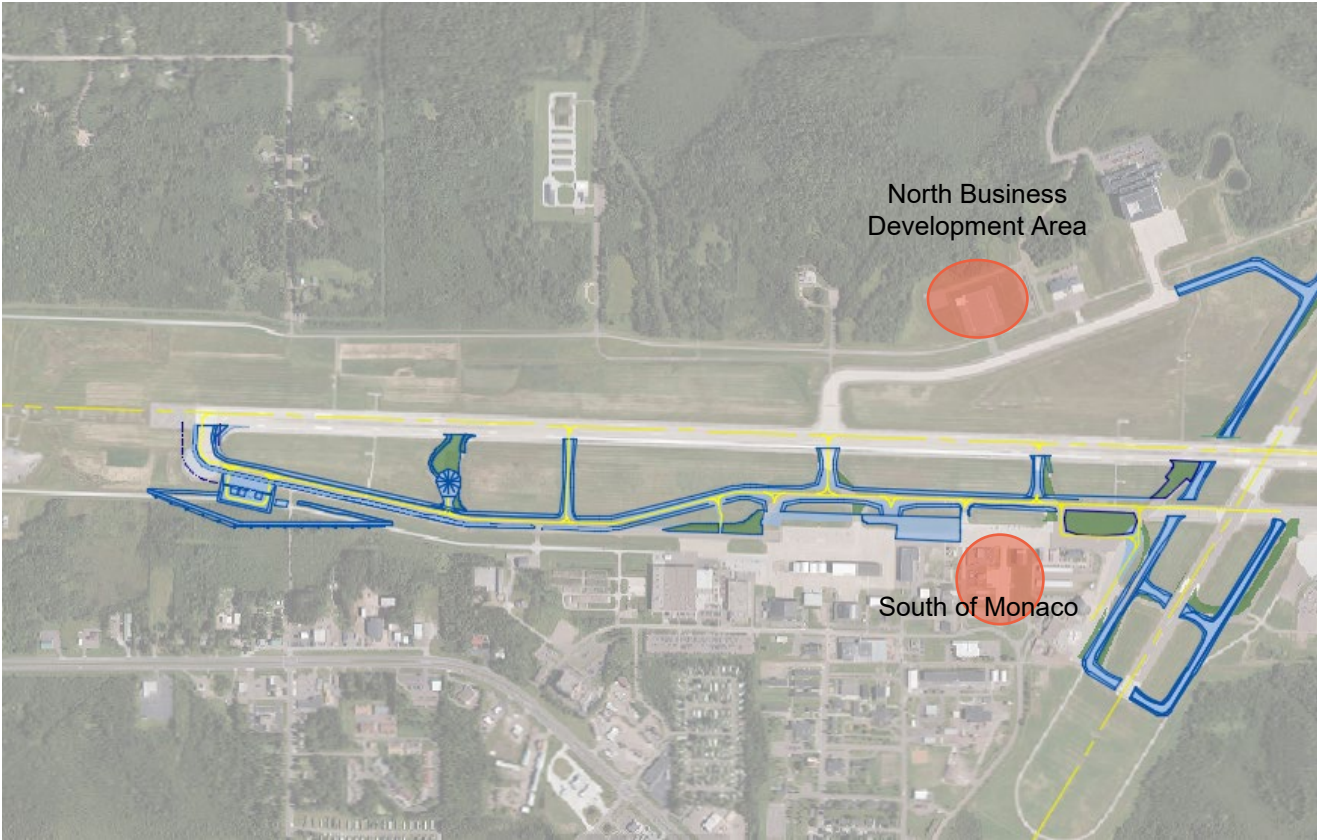
- Type of Aircraft
  - 5 Jets
  - 50 Piston engine aircraft
  - 8 Helicopters
  - 5 Turboprops
- Airplane Design Group (ADG)
  - ADG I – 54
  - ADG II – 6
  - Helicopters – 8\*

\*Helicopter design standards are different from fixed wing. ADG I safety clearances exceed safety clearances for all based helicopters

# Hangar Waiting List

- 19 Total aircraft on waiting list
  - 5 are current tenants looking for a larger hangar or different t-hangar
  - Net 14 *new* potential based aircraft
  
- Aircraft type on waiting list
  - ADG I - 57%
  - Unknown aircraft type - 43%

# Shovel Ready Sites

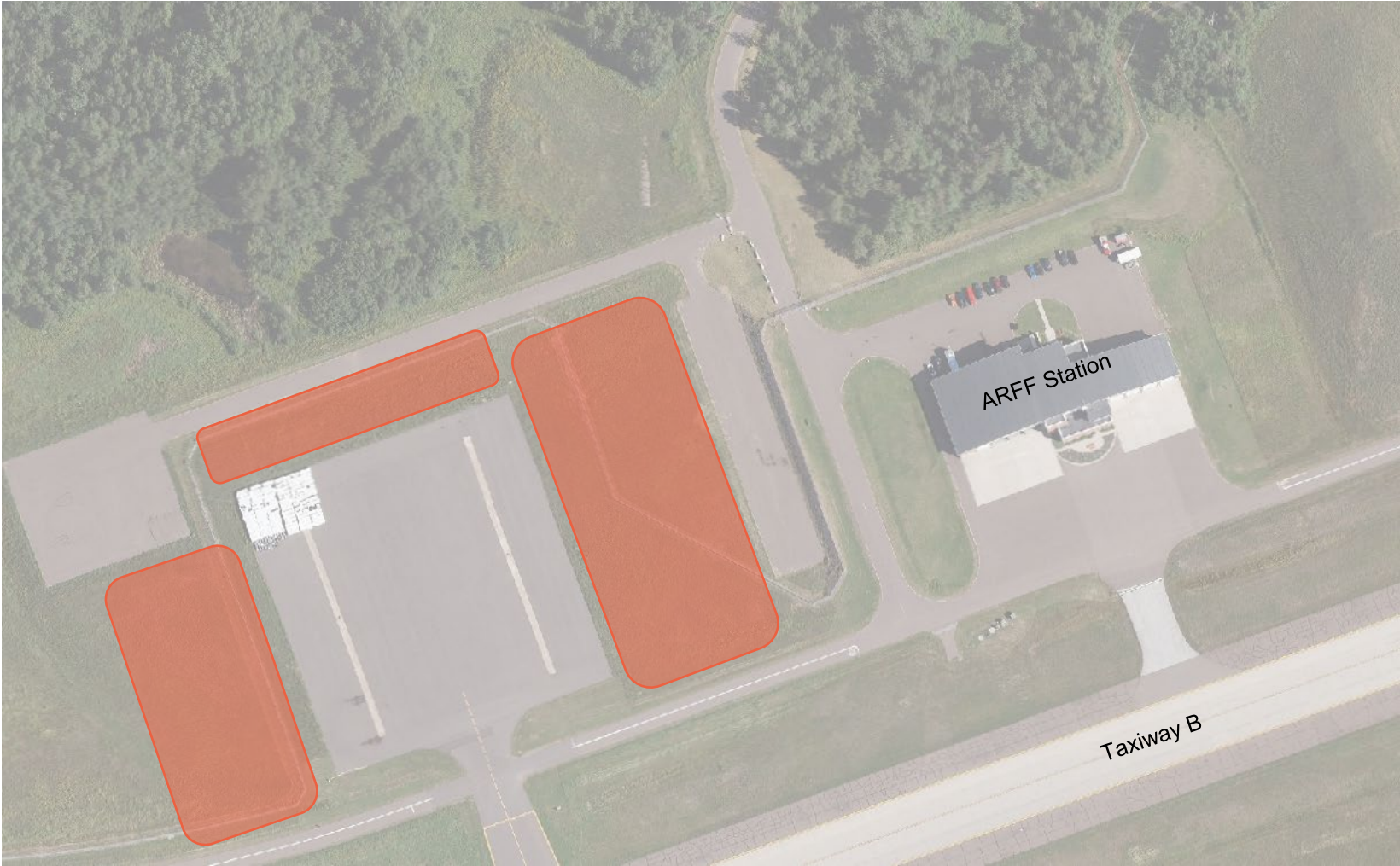


# Shovel Ready Sites – SW Quadrant





# Shovel Ready Sites – NBDA



# Menti.com

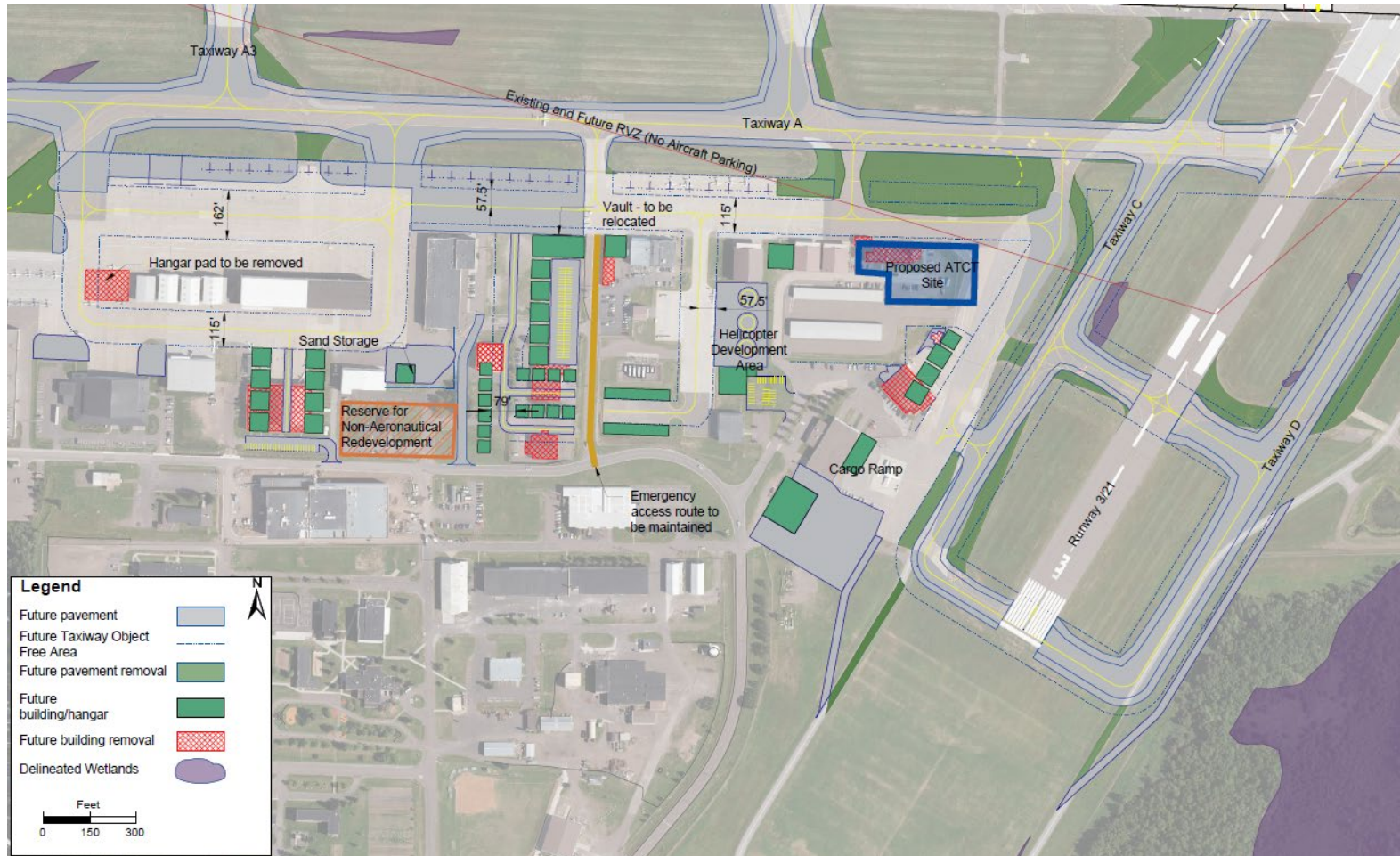
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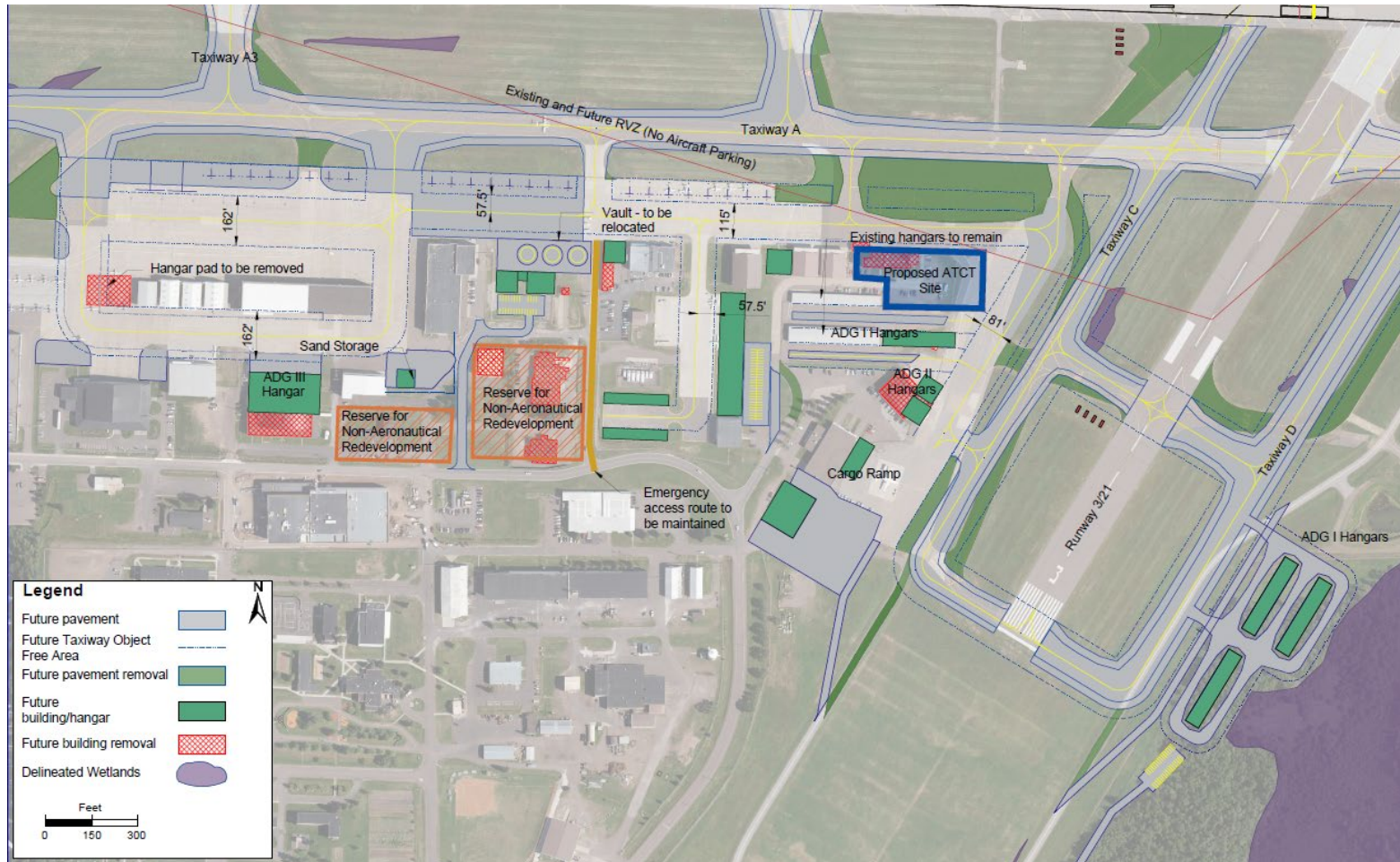


# Alternative 1A – Current ATCT Site



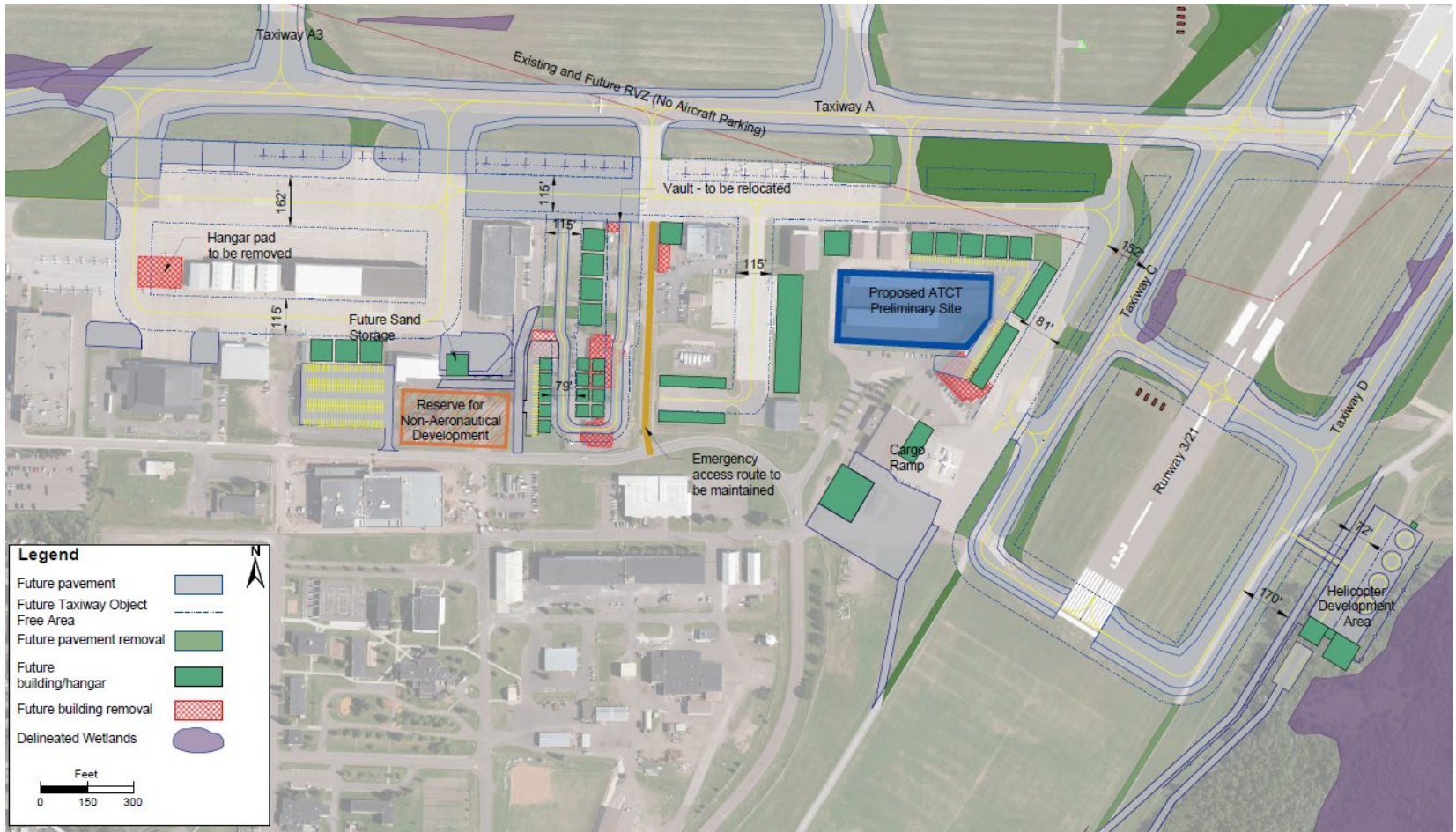


# Alternative 1B – Current ATCT Site

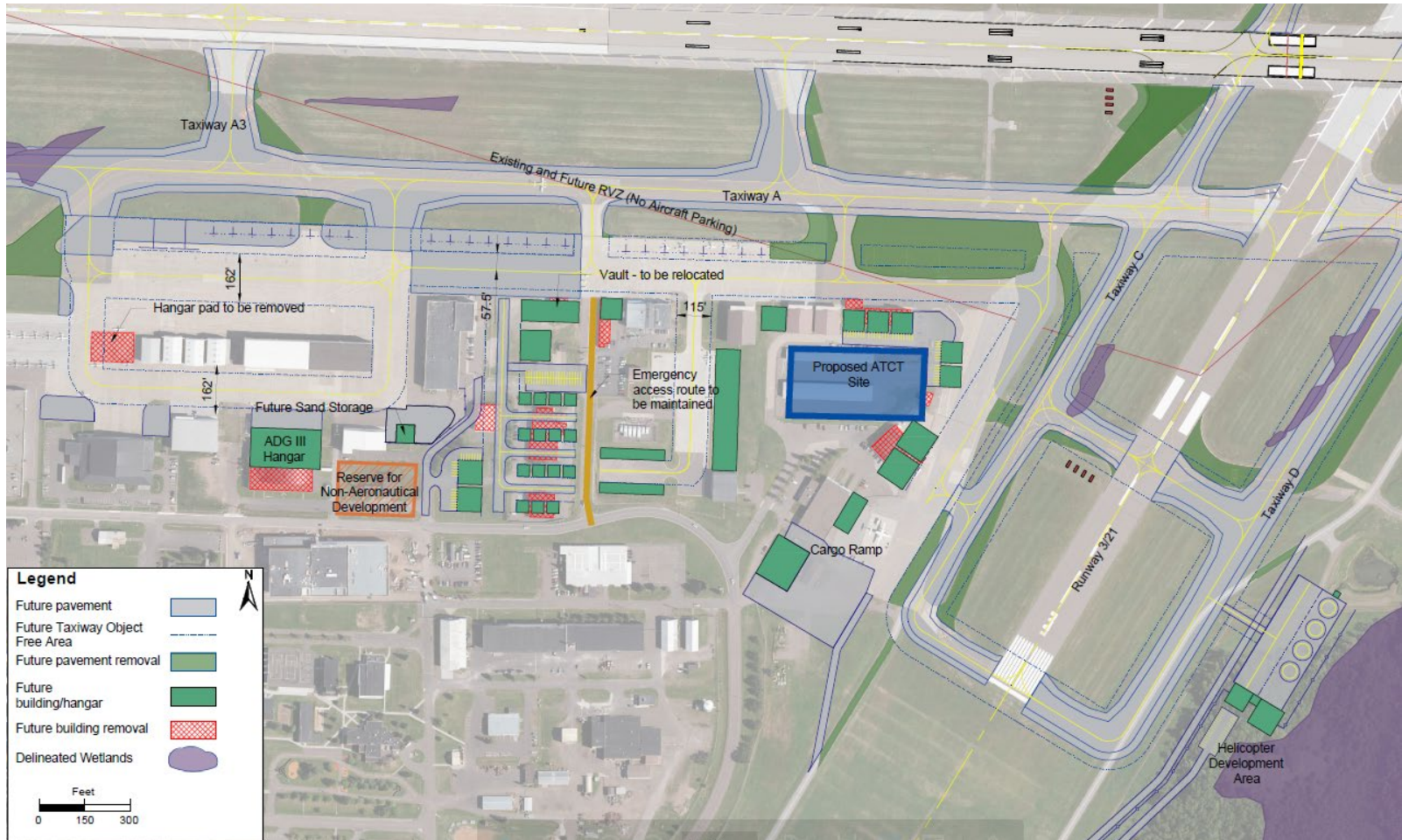




# Alternative 2A – South of the current ATCT Site

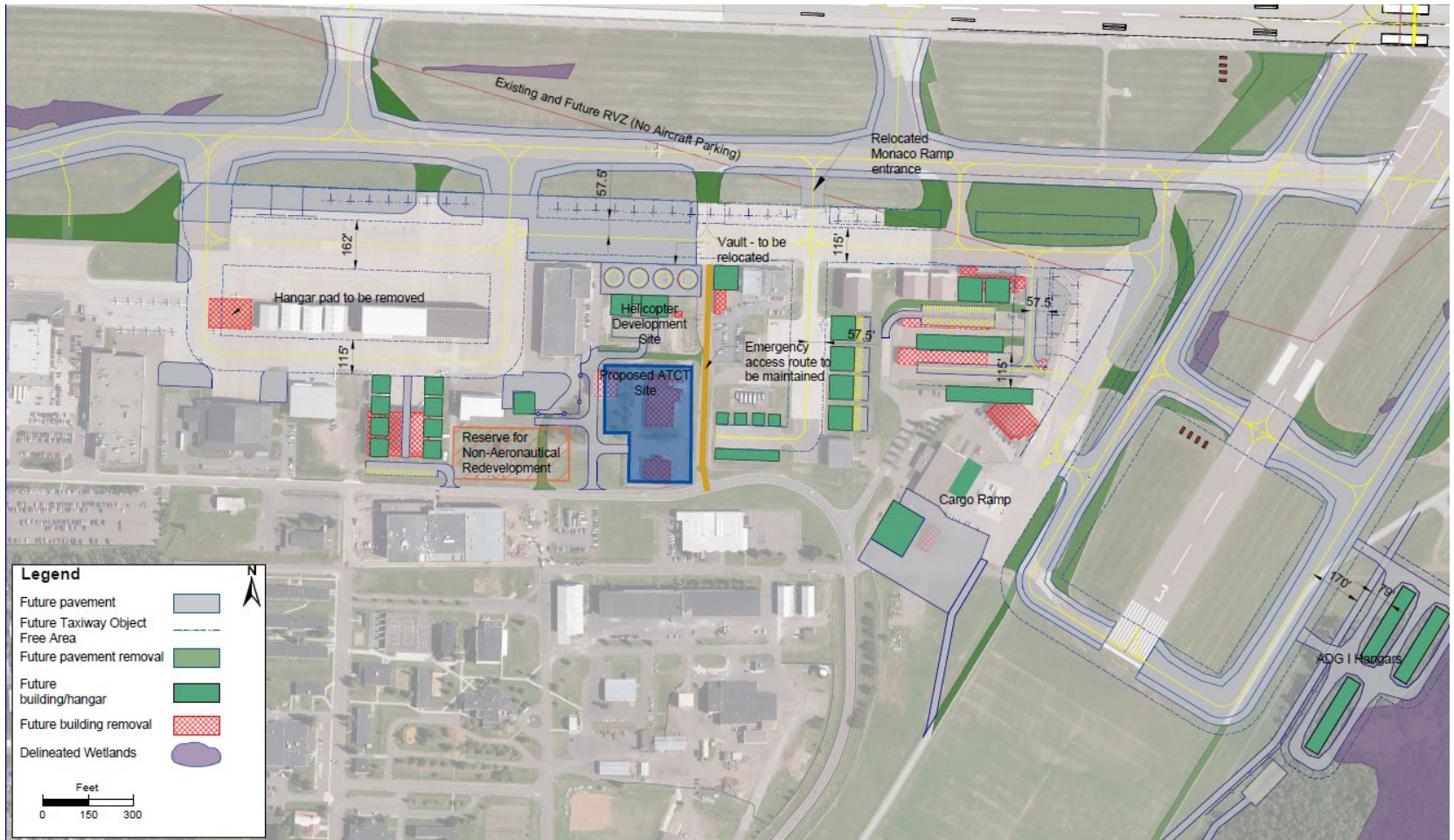


# Alternative 2B – South of the current ATCT Site

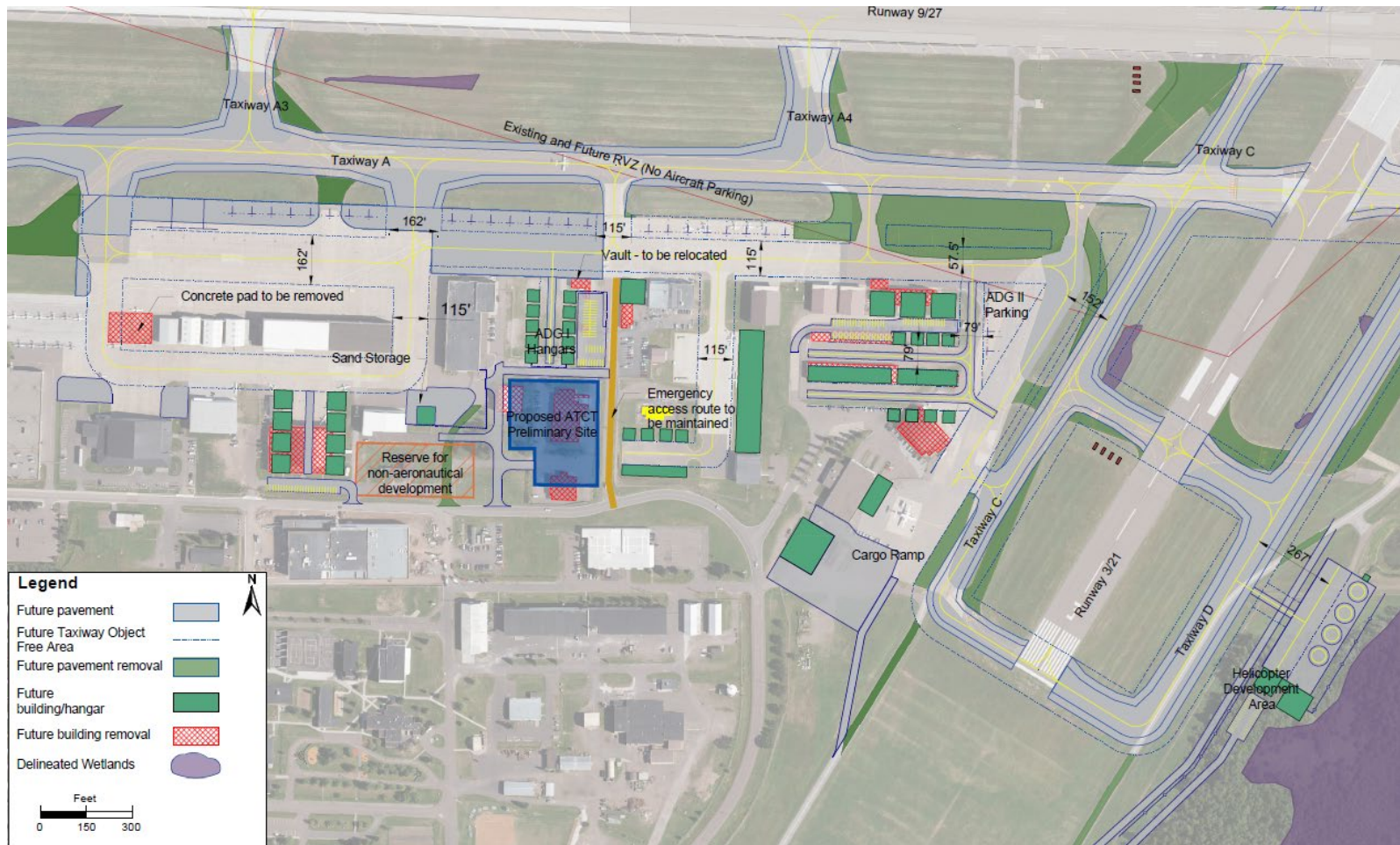




# Alternative 3A – Adjacent to the SRE

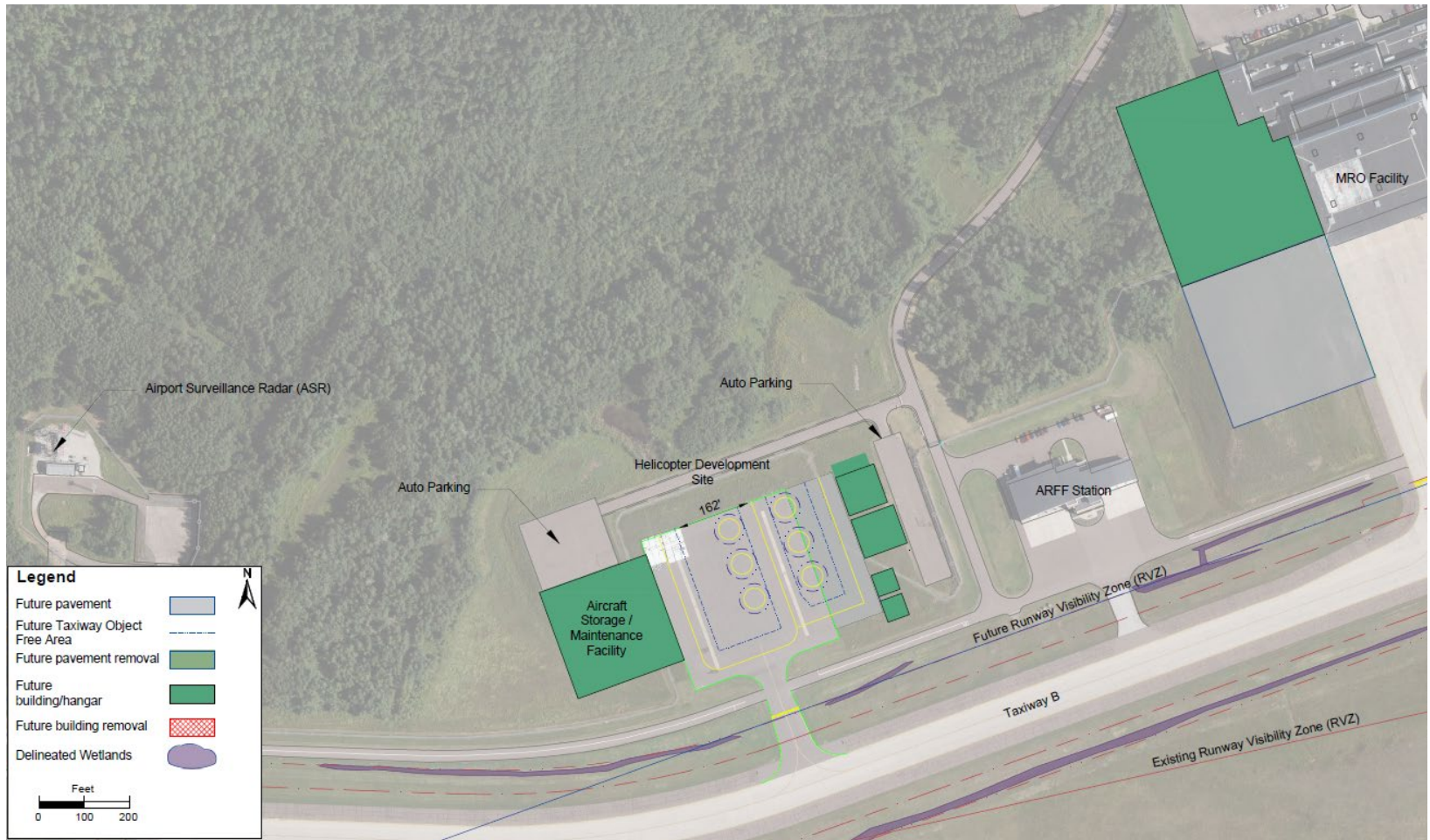


# Alternative 3B – Adjacent to the SRE





# Alternative 4A – North Business Development Area



# Alternative 4B – North Business Development Area





# Western Airport Road (West of Cirrus)



# Questions and Discussion



# Thank You!