Duluth Airport Master Plan

Taxiway Network and Apron Parking Technical Advisory Committee (TAC) Meeting #7

October 13, 2021

Introductions

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Introductions

- Name
- Organization
- Role

Meeting Agenda

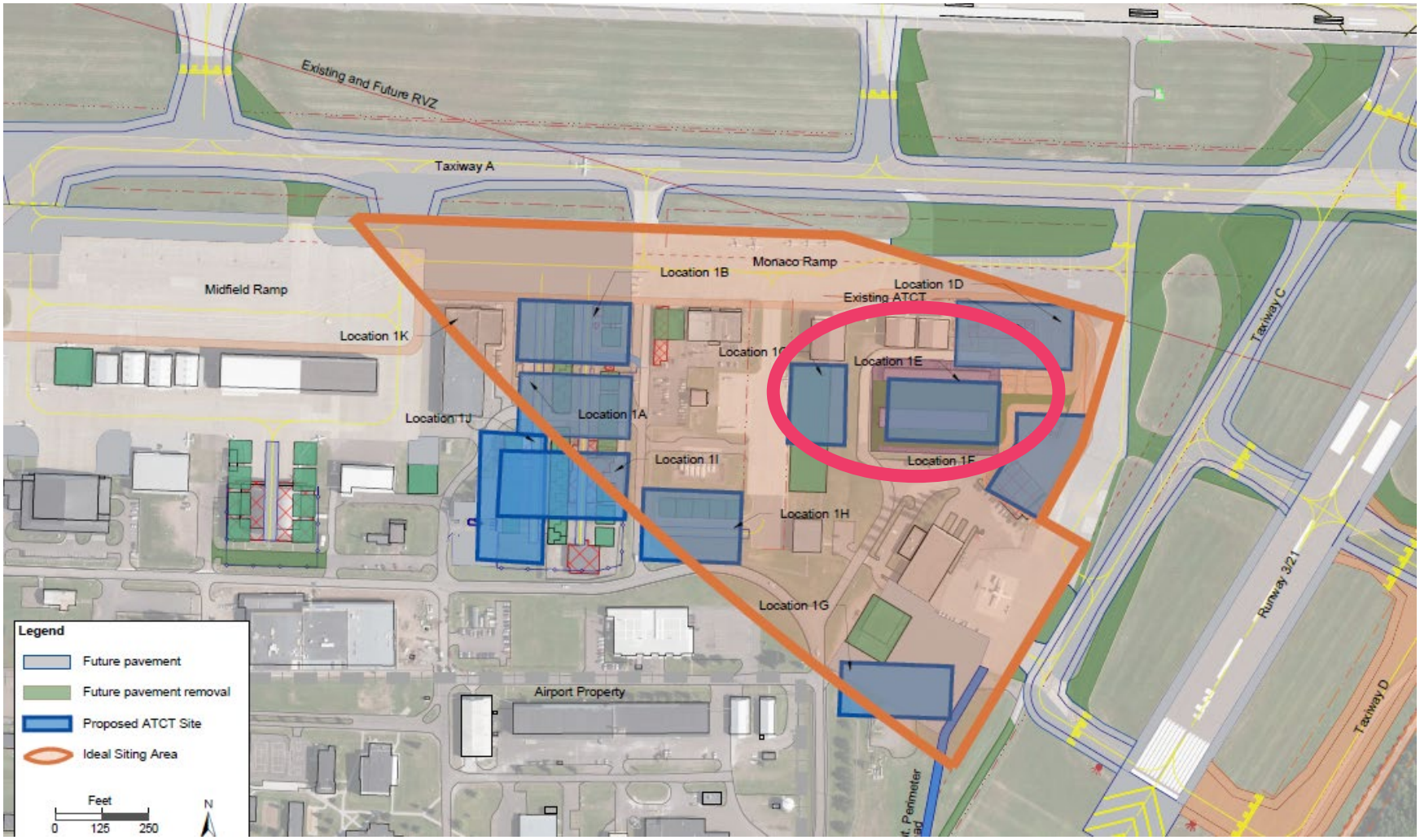
- Preferred Air Traffic Control Tower location
- Proposed Taxiway Network
- Building Area Layouts
- Proposed apron and aircraft parking layout

Air Traffic Control Tower

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, 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 determine final siting and height of ATCT through an FAA study prior to project implementation.*

Preferred Tower Site



Air Traffic Control Tower - Next steps

1. FAA Siting Study
   - FAA reimbursable agreements – Will require a funding source to cover costs
   - DAA is initiating coordination with FAA
2. Identify funding source for ATCT design and construction
3. NEPA review
4. Design
5. Multi-year construction
   - Site preparation including T-hangar relocation
   - Tower construction

Goals of the Taxiway Network and Aircraft Parking

Goals of Taxiway Design

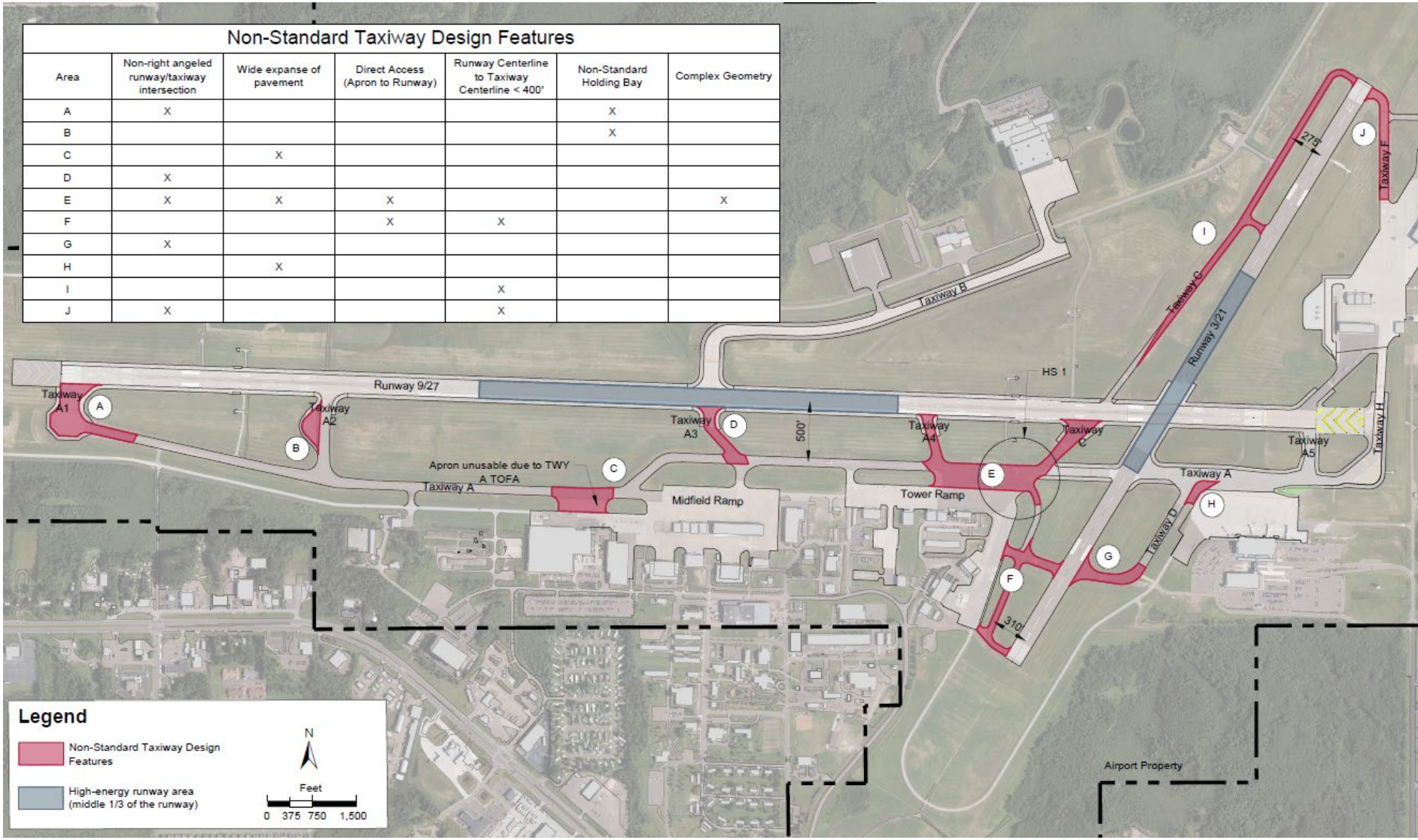
- Good design practices keep taxiway intersections simple.
- Complex layouts increase the possibility of pilot error.
- Three-node concept – A pilot has no more than 3 choices at an intersection – ideally, left, right and straight ahead.
- Intersection angles – Design turns to be 90 degrees wherever possible.

Design to Reduce Runway Incursions

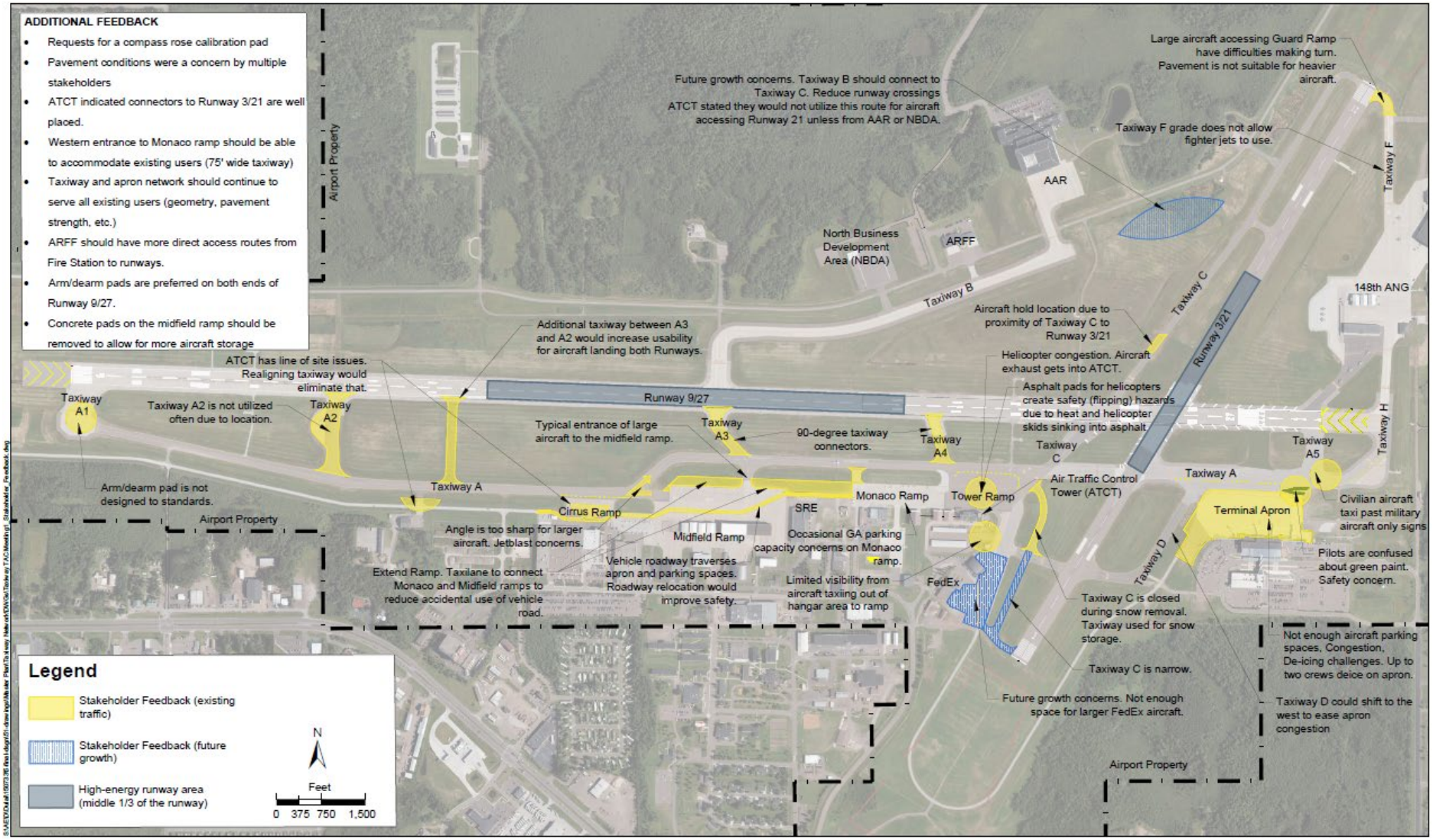
- Increase situational awareness, keep taxiway systems simple
- Avoid wide expanses of pavement
- Limit runway crossings
- Avoid “dual purpose” pavements
- Avoid “high energy” intersections (middle 1/3 of the runway)
- Avoid direct access to runways
- Increase visibility – Right angle intersections provide the best visibility

FAA Non-Standard Areas (See figure in meeting packet)

Non-Standard Taxiway Design Features						
Area	Non-right angeled runway/taxiway intersection	Wide expanse of pavement	Direct Access (Apron to Runway)	Runway Centerline to Taxiway Centerline < 400'	Non-Standard Holding Bay	Complex Geometry
A	X				X	
B					X	
C		X				
D	X					
E	X	X	X			X
F			X	X		
G	X					
H		X				
I				X		
J	X			X		



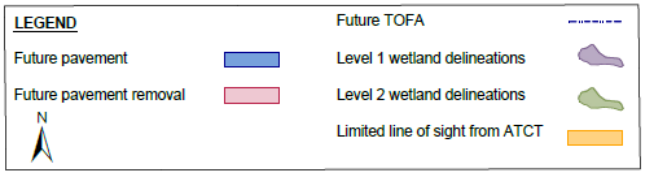
User Feedback (See figure in meeting packet)

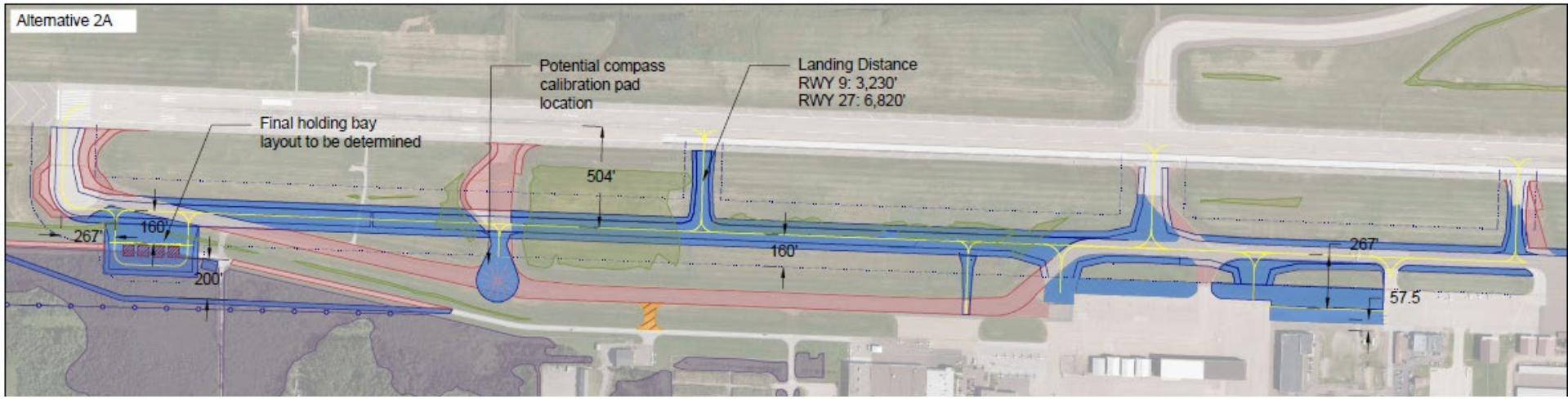


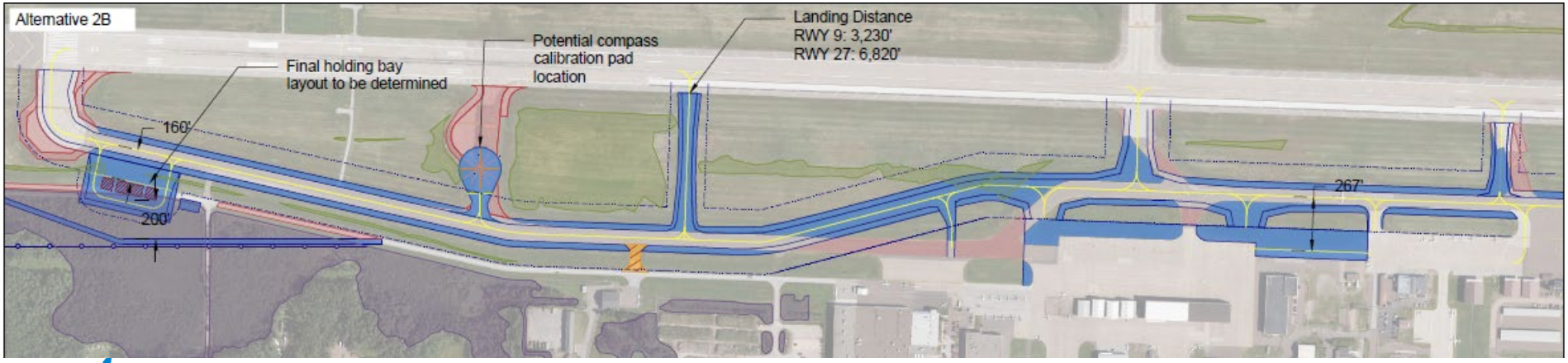
Proposed Runway 9-27 Taxiway Network

Taxiway A – Alternatives 2A and 2B

Second Round of Alternatives







Taxiway TAC Feedback

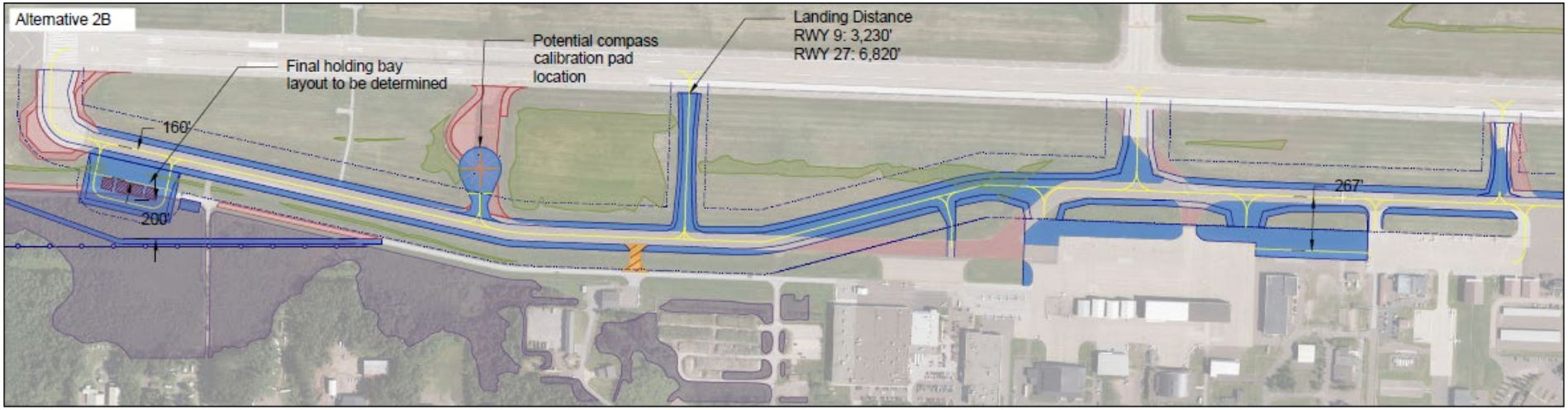
Preferred Taxiway A Alignment

Full Parallel Taxiway A (2A)

Modified Existing Taxiway A (2B)

I'm not sure et or would like to further evaluate building area alternatives before deciding

Taxiway A – Preferred Alternative (Alt 2B)



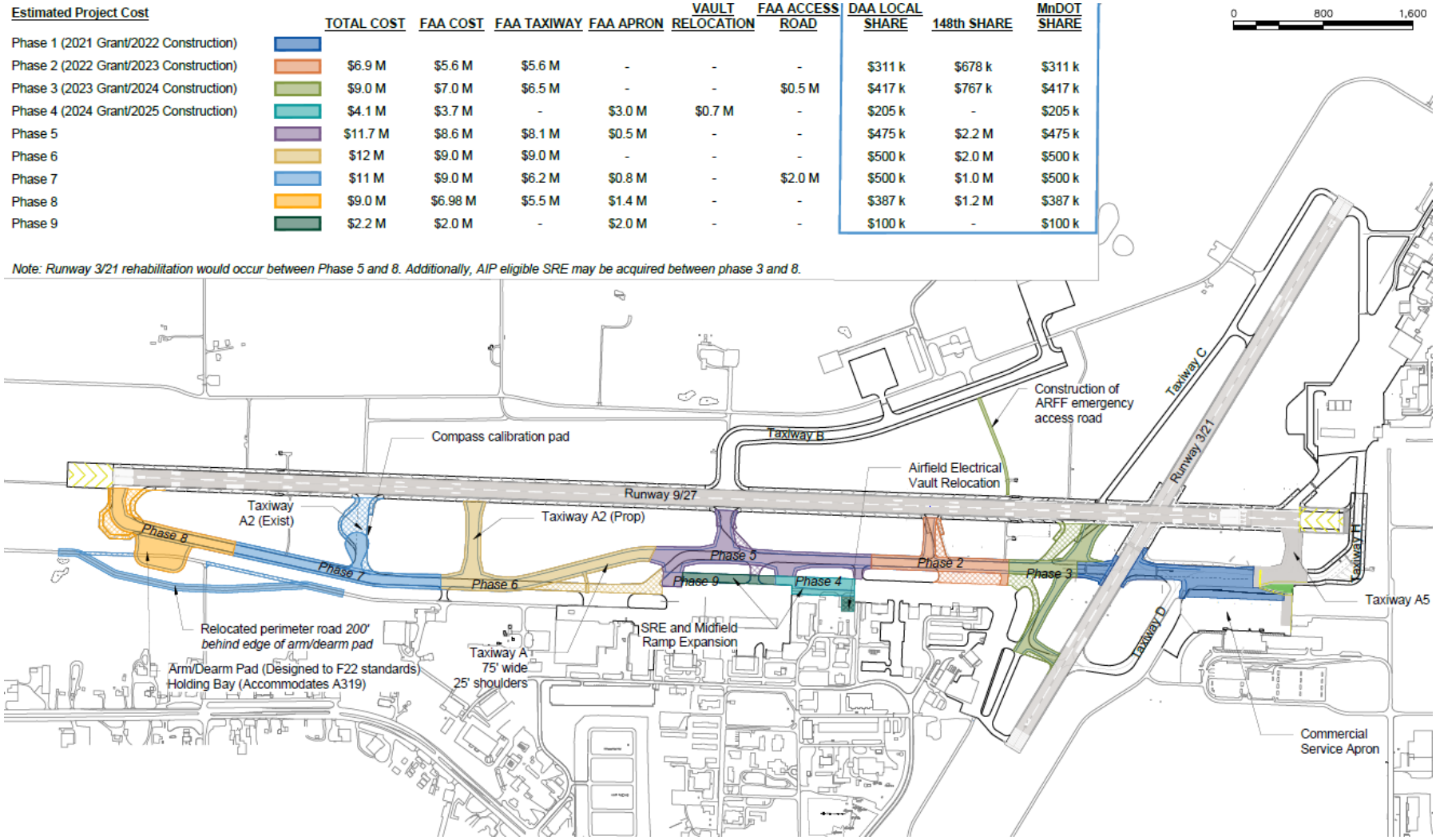
LEGEND

- Future pavement
- Future pavement removal
- N
- Future TOFA
- Level 1 wetland delineations
- Level 2 wetland delineations
- Limited line of sight from ATCT

Taxiway A – Future Phasing

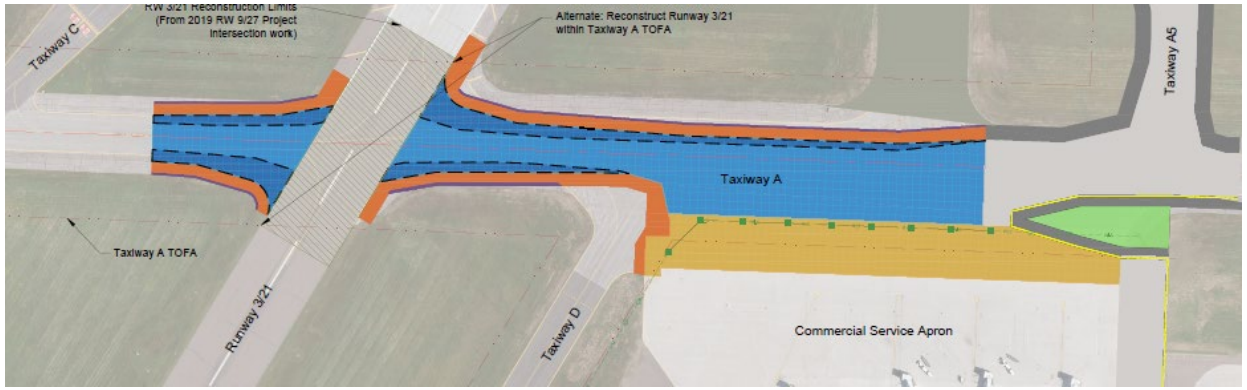
Estimated Project Cost	TOTAL COST	FAA COST	FAA TAXIWAY	FAA APRON	VAULT RELOCATION	FAA ACCESS ROAD	DAA LOCAL SHARE	148th SHARE	MnDOT SHARE
Phase 1 (2021 Grant/2022 Construction)									
Phase 2 (2022 Grant/2023 Construction)	$6.9 M	$5.6 M	$5.6 M	-	-	-	$311 k	$678 k	$311 k
Phase 3 (2023 Grant/2024 Construction)	$9.0 M	$7.0 M	$6.5 M	-	-	$0.5 M	$417 k	$767 k	$417 k
Phase 4 (2024 Grant/2025 Construction)	$4.1 M	$3.7 M	-	$3.0 M	$0.7 M	-	$205 k	-	$205 k
Phase 5	$11.7 M	$8.6 M	$8.1 M	$0.5 M	-	-	$475 k	$2.2 M	$475 k
Phase 6	$12 M	$9.0 M	$9.0 M	-	-	-	$500 k	$2.0 M	$500 k
Phase 7	$11 M	$9.0 M	$6.2 M	$0.8 M	-	$2.0 M	$500 k	$1.0 M	$500 k
Phase 8	$9.0 M	$6.98 M	$5.5 M	$1.4 M	-	-	$387 k	$1.2 M	$387 k
Phase 9	$2.2 M	$2.0 M	-	$2.0 M	-	-	$100 k	-	$100 k

Note: Runway 3/21 rehabilitation would occur between Phase 5 and 8. Additionally, AIP eligible SRE may be acquired between phase 3 and 8.



Taxiway A Phase 1 (2022 construction)

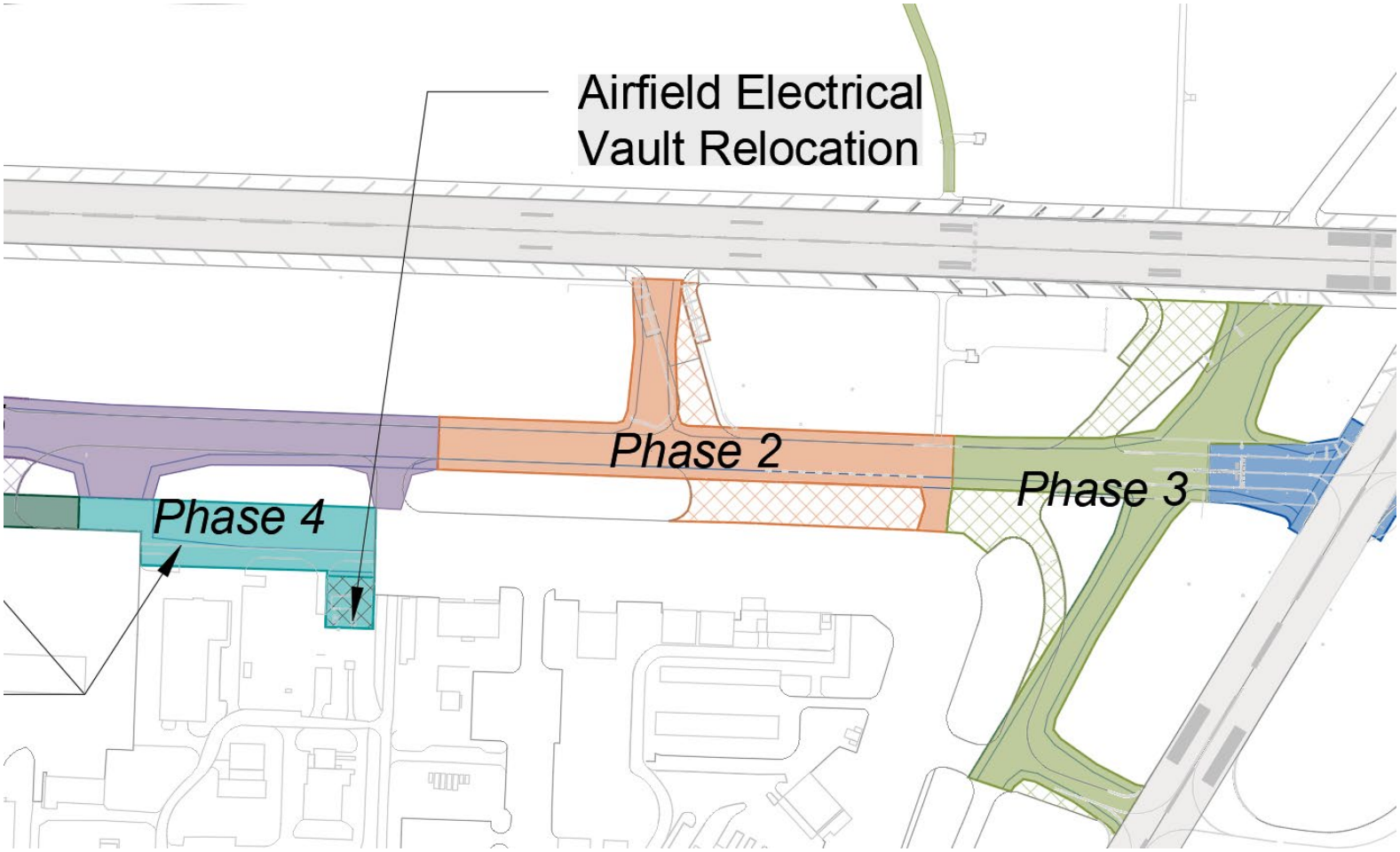
	Funding Sources			
	148th ANG	FAA (100% Funding)	MnDOT	Airport
Taxiway A Reconstruction	$796,000	$6.8 Million	-	-
Design	$16,800	$442,500	-	-
Construction Administration	$95,000	$800,000	-	-
Total	**$907,800**	**$8,042,500**	**$0**	**$0**



Future phases will continue to require investment by the 148th Fighter Wing to fund the taxiway width that is beyond what the FAA will fund.

Note: Numbers are rounded

Taxiway A Phase 2 (2022 Grant/2023 Construction)



Phases 2-9 Taxiway A Cost Shares

Estimated Project Cost	TOTAL COST	FAA COST	FAA TAXIWAY	FAA APRON	VAULT RELOCATION	FAA ACCESS ROAD	DAA LOCAL SHARE	148th SHARE	MnDOT SHARE
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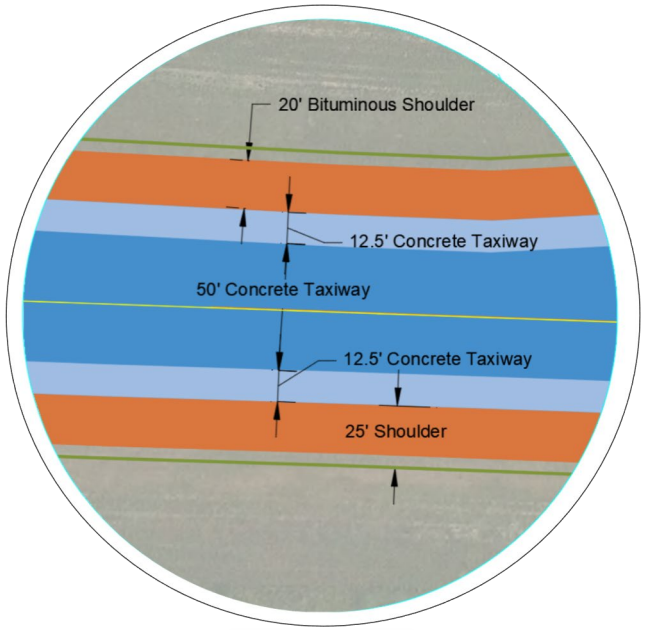


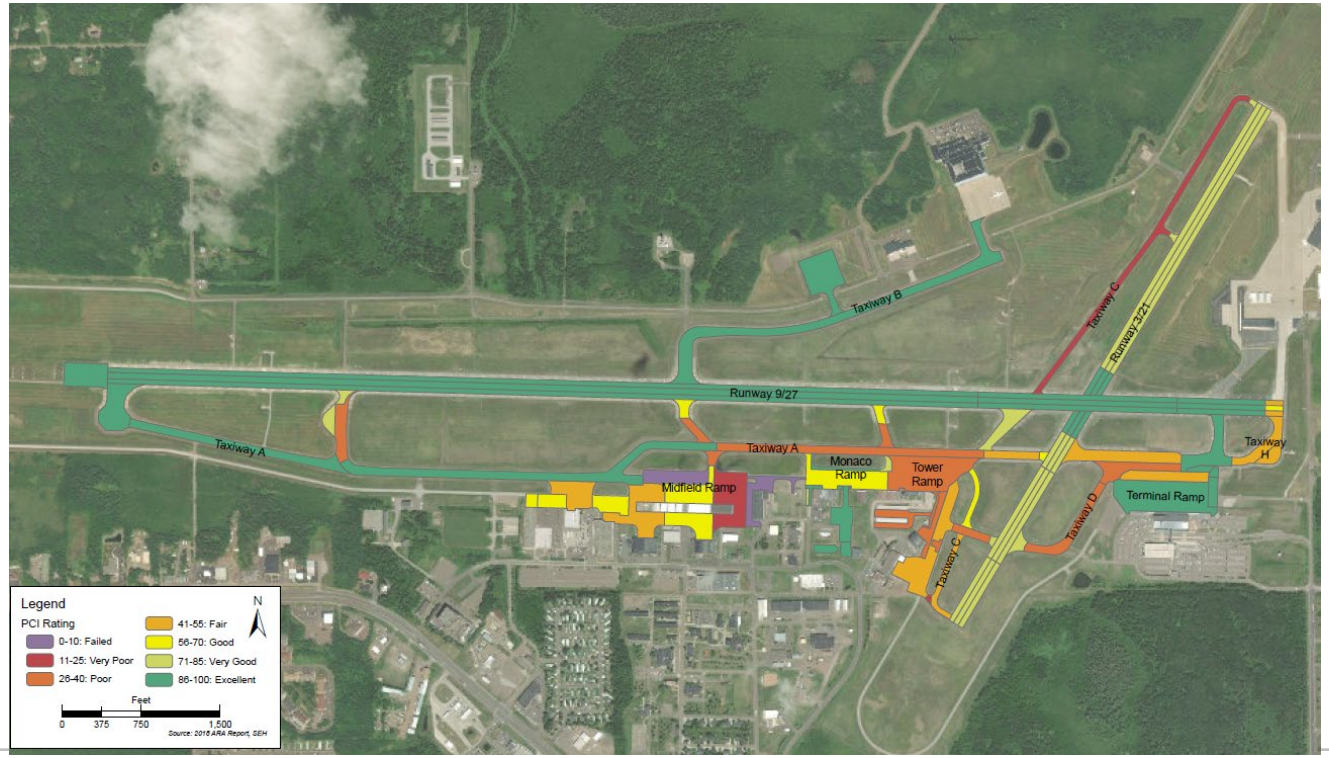
Proposed Runway 3-21 Taxiway Network

Runway 3-21

- Runway 3-21 TAC recommended an ultimate length of 8,000’ – shown as an ultimate condition on the ALP.
- Length of 8,000’ would support the needs of both the 148th and the critical aircraft
- Funding is not available from the FAA for this extension. Alternative funding sources (ie. bonding) will need to be secured for the project to move forward.

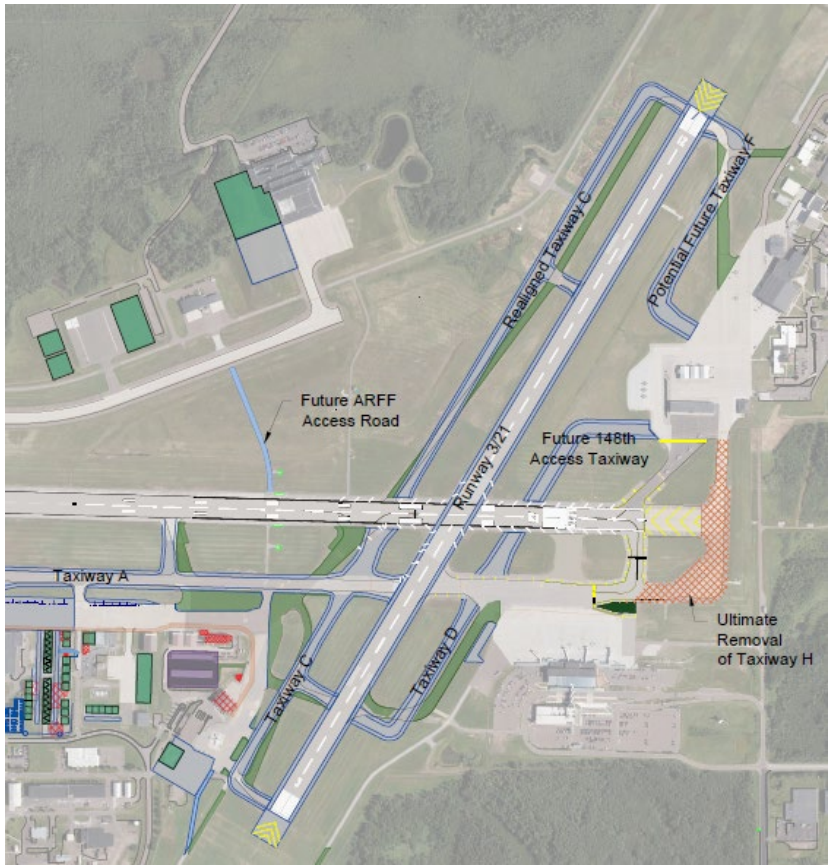
Pavement Condition (PCI)

- Taxiway C is in very poor condition north of Runway 9-27 (2018 Report).
- Pavement reconstruction of both Runway 3/21 and Taxiway C is needed in the near-term

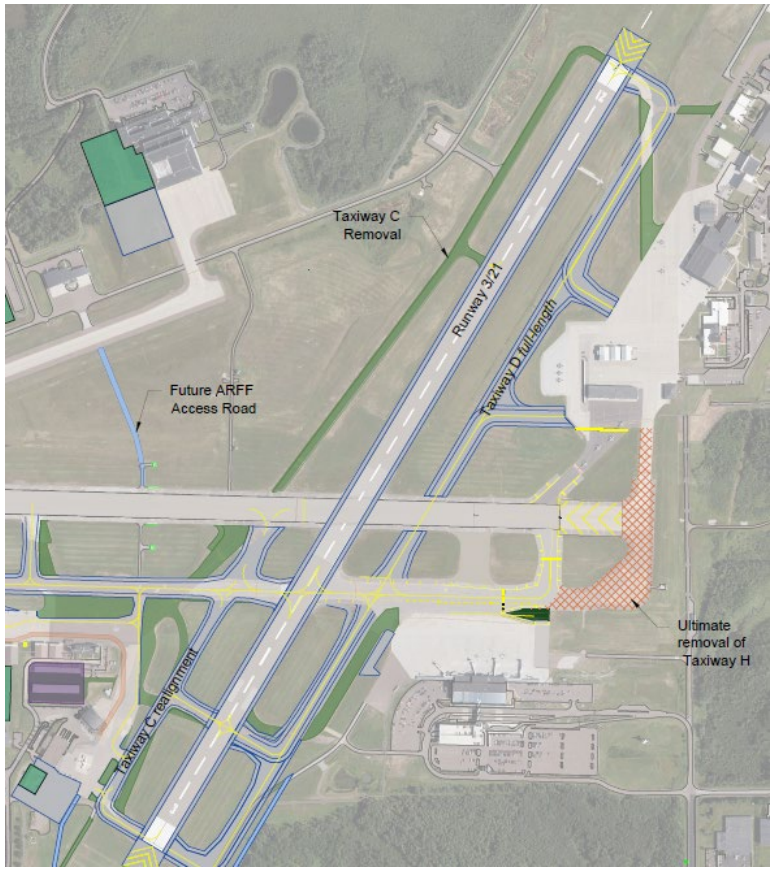


Future Runway 3-21 Taxiway Network (1-20 years)

Full length Taxiway C

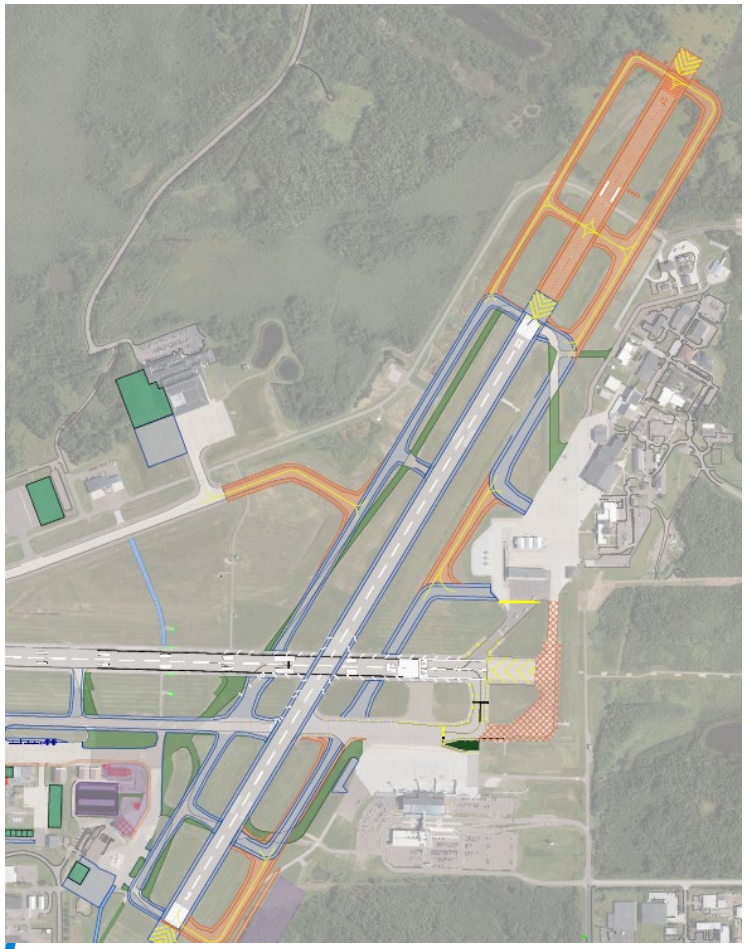


Full-length Taxiway D

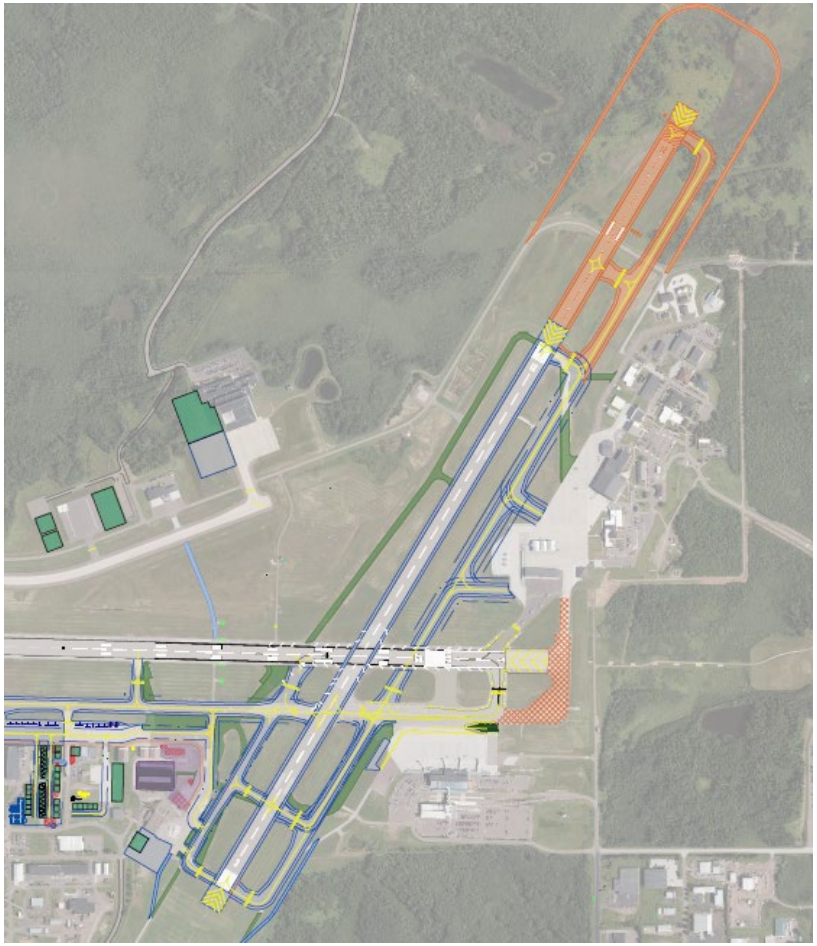


Ultimate Runway 3-21 Taxiway Network (20+ years, triggered by runway extension)

Full length Taxiway D and C



Full-length Taxiway D



Full-Length Alternatives for Runway 3-21

Taxiway C Full-length

- Designed for critical aircraft
  - Large aircraft would need to back-taxi on Runway 3 to the Guard Ramp
- Does not meeting current design standards for runway to taxiway separation. Requires taxiway shift.
- Poor pavement condition, requires reconstruction in the near term
- Control Tower identified a better traffic flow with a full-length on the west side

Taxiway D Full-length

- Could potentially be built in the long term (20+ years)
- Could be triggered by the ultimate Runway 3-21 extension
- Additional funding opportunities if it becomes the parallel taxiway to Runway 3/21

Mentimeter

CODE: 1598 2929

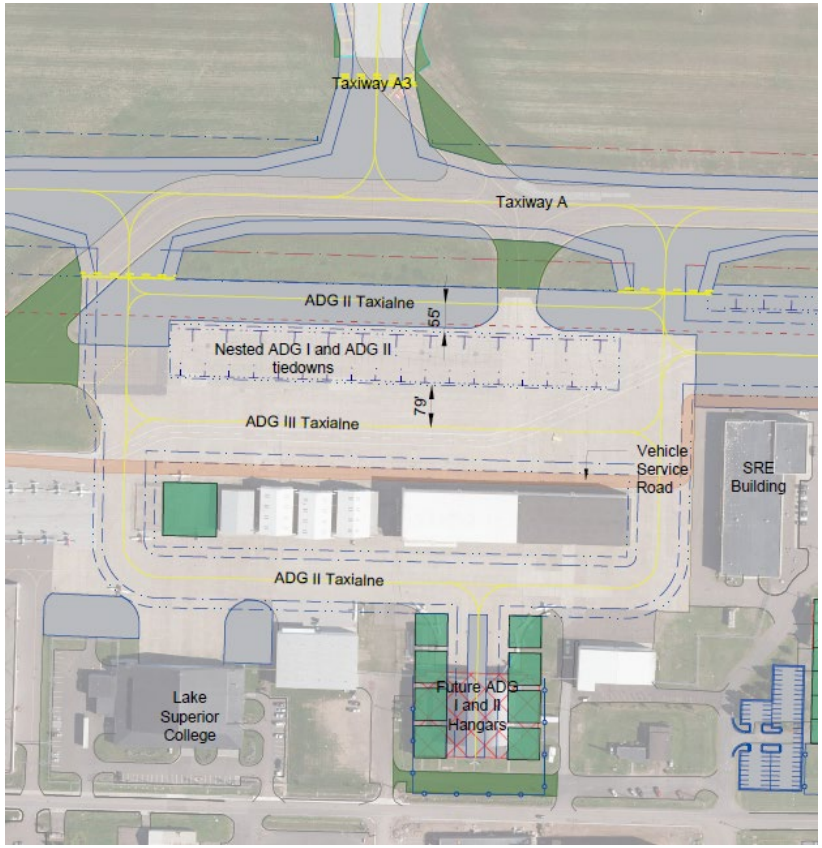
Aircraft Parking Aprons

Aircraft Parking and Apron Design

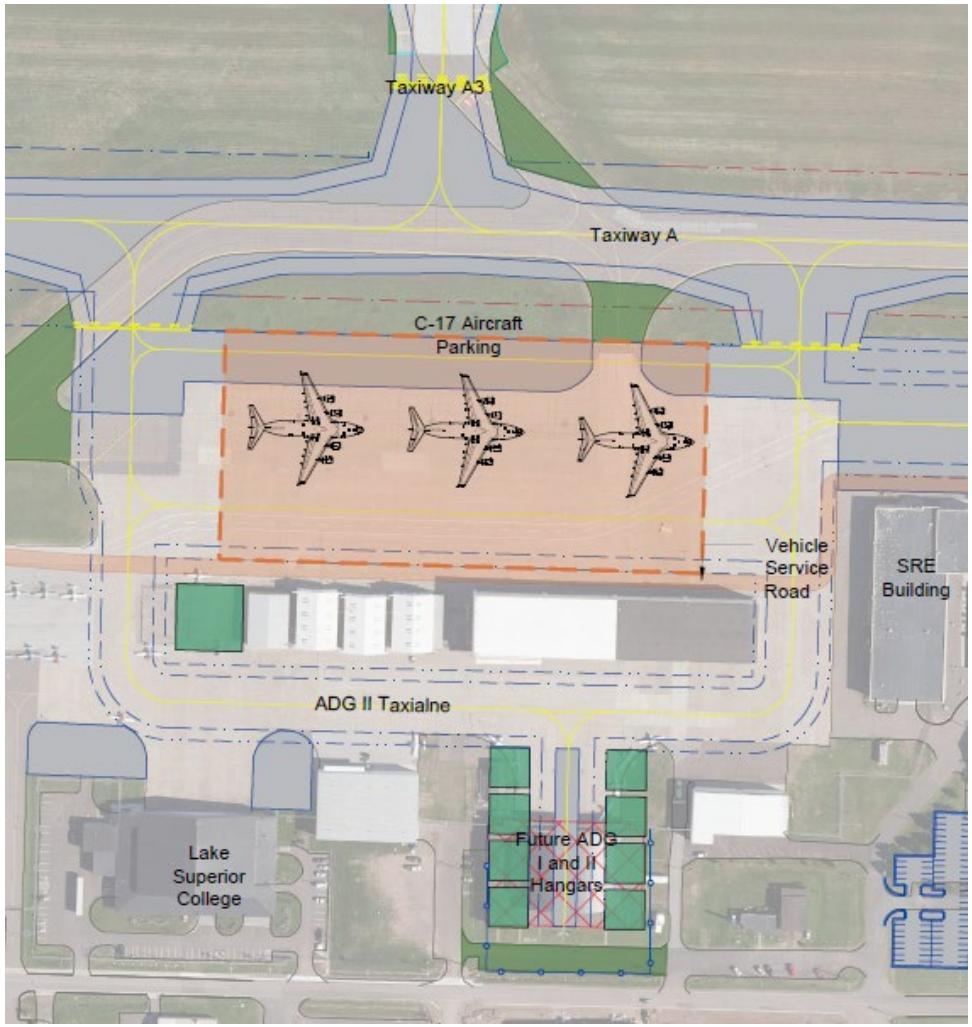
- Accommodate existing aircraft parking spaces, while providing for forecasted demand of tie-down needs
  - By 2038:
    - 30 ADG I tiedowns
    - 9 ADG II tiedowns
    - 1 ADG II tiedown
    - 4 helicopter tiedowns – ability to accommodate in the future
  - Demand changes day to day
  - Existing demand is currently met in areas not designated as a tiedowns and within the RVZ. These parking locations are not feasible long-term.
- An ADG III Taxilane should be provided based on feedback from stakeholder for transient aircraft clearing Customs
  - ADG III aircraft include aircraft with a wingspan of <118’
- An area should be able to be flexed as needed for larger aircraft parking
- Draft Design AC was used to develop aircraft parking layouts

Midfield Ramp

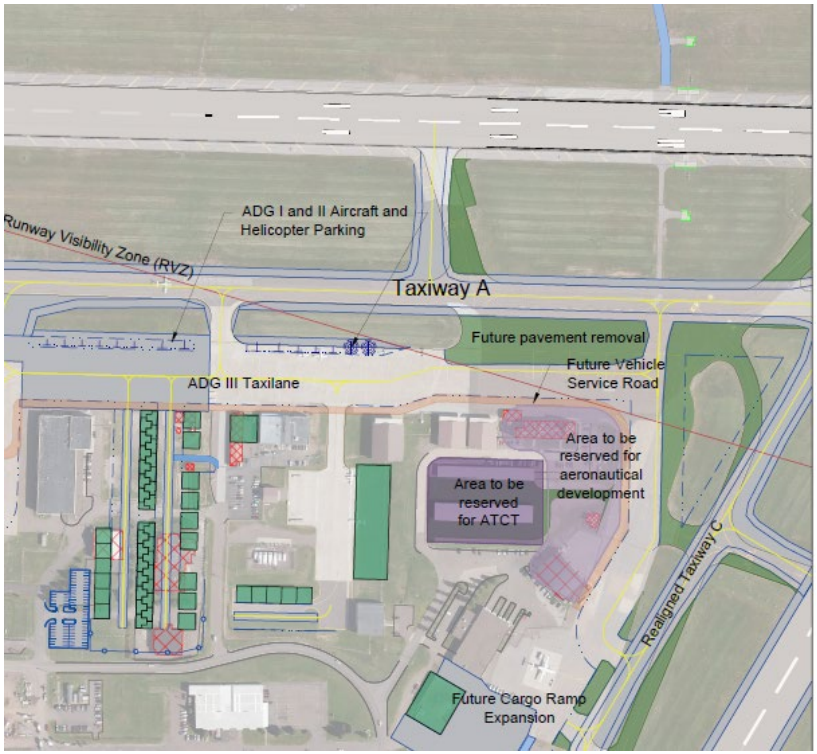
- Accommodates up to ADG III
- Capacity for forecasted transient tiedown needs
- Area can be flexed with the closure of the ADG II Taxilane
- Future building on the midfield ramp could be built in the future – taxilane network to remain



Larger Aircraft (Flex) Parking – C17



Monaco and Tower Ramps



- Accommodates up to ADG III aircraft
- *No ADG III aircraft parking on the Monaco or Tower Ramps*
- Capacity for forecasted transient tiedown needs split between Midfield and Monaco ramps
- Tower Ramp pavement removal due to RVZ

Proposed Building Area Layout

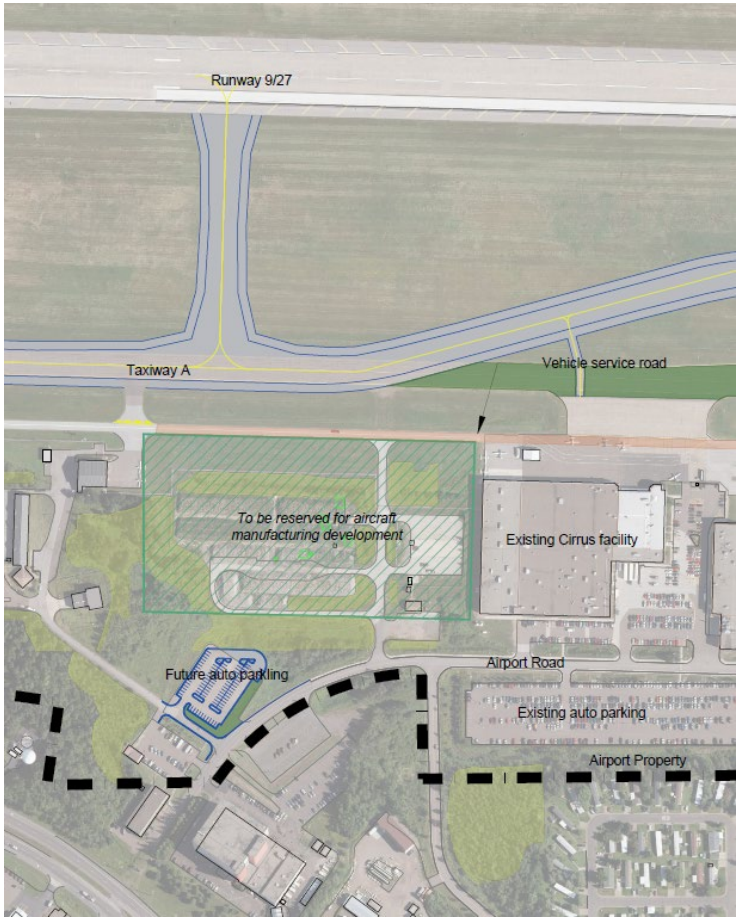
Aeronautical Building Area Needs and Goals *(Taxiway and Apron TAC)*

- 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

Airport Layout Plan (ALP)

- Graphical depiction of existing, future and ultimate conditions of the airport
- FAA approves the Plan
- Depicts potential development layouts and does not restrict the Airport from the development of other sizes or types of building / hangars
- If the development needs change, an ALP sheet update can be submitted to the FAA for proposed development

Aircraft Manufacturing Area



Aircraft Manufacturing Use

~ 11 Acres

Availability: Leased by 148th FW until June 2023

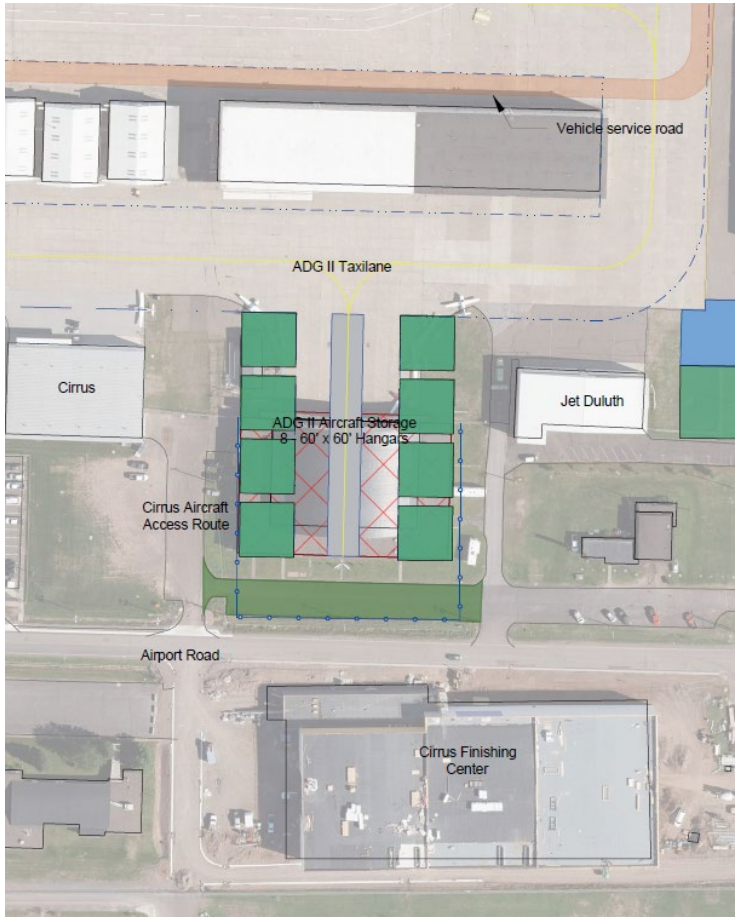
Opportunities

- Road Access
- Adjacent to existing aeronautical manufacturing
- Potential nearby parking capacity (south)

Challenges

- Site currently under environmental clean up
- Potentially challenging soils
- Wetland impacts

Hangar 101 Site



80’ x 80’ Box Hangars

Availability: Potentially 2026

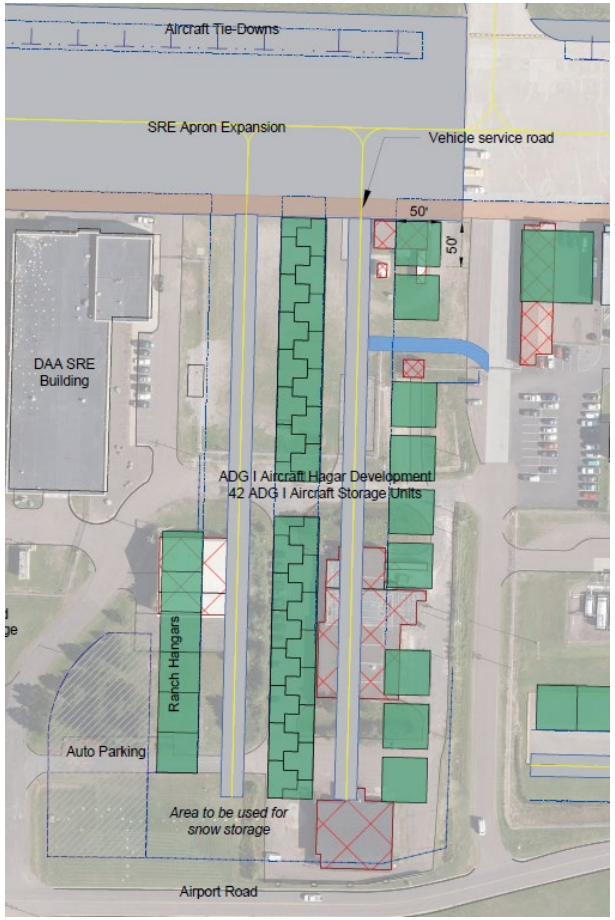
Opportunities

- Accommodates multiple box hangars
- Strong GA hangar demand

Challenges

- Environmental review and potential cleanup will delay site availability for multiple years

Between Monaco and the SRE Building



Mix of T and Ranch Hangars

Availability: Likely over 5 years

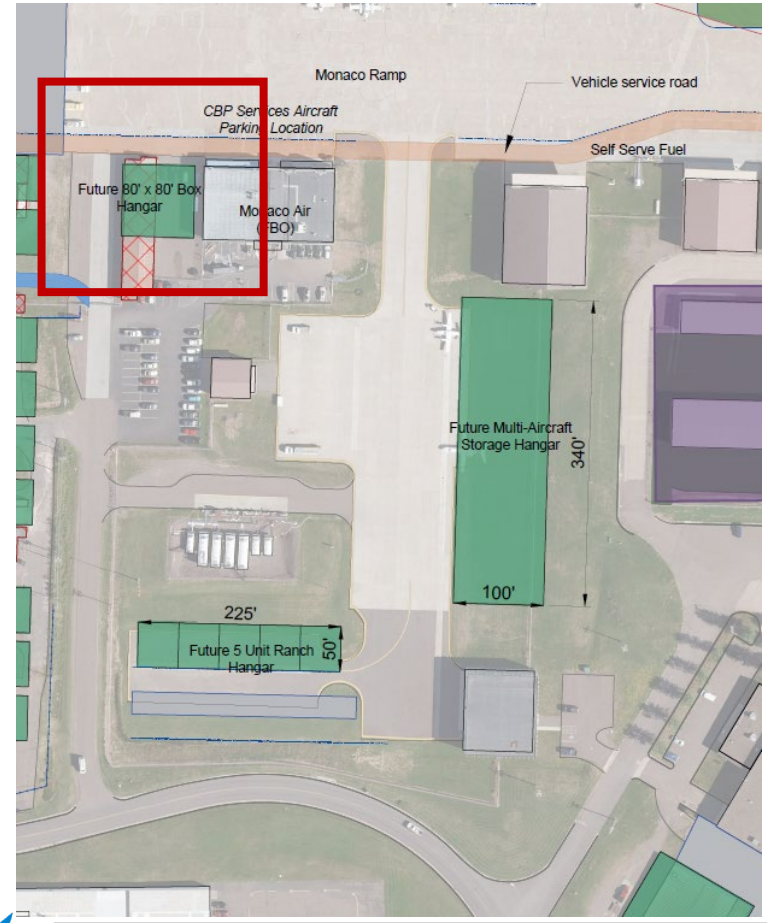
Opportunities

- Ability to serve large number of small GA aircraft
- Accommodates hangar users that will be relocated from the future ATCT site
- Strong GA hangar demand

Challenges

- Requires removal of multiple structures
- Supporting infrastructure (taxilane) development needed

South of the Monaco Ramp
Box Hangar Development



Availability: Near Term – following removal of DAA owned T-Hangars

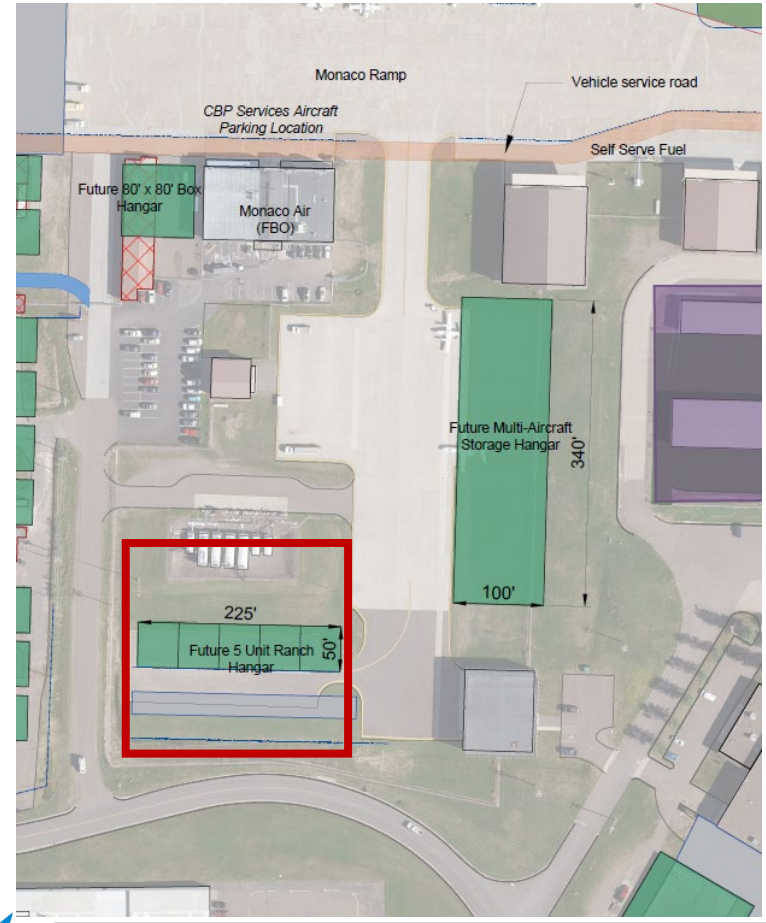
Opportunities

- Direct apron access
- Located adjacent to FBO facility

Challenges

- Requires removal of t-hangar and relocation of users

South of the Monaco Ramp
Ranch Hangar Development



Availability: Shovel Ready

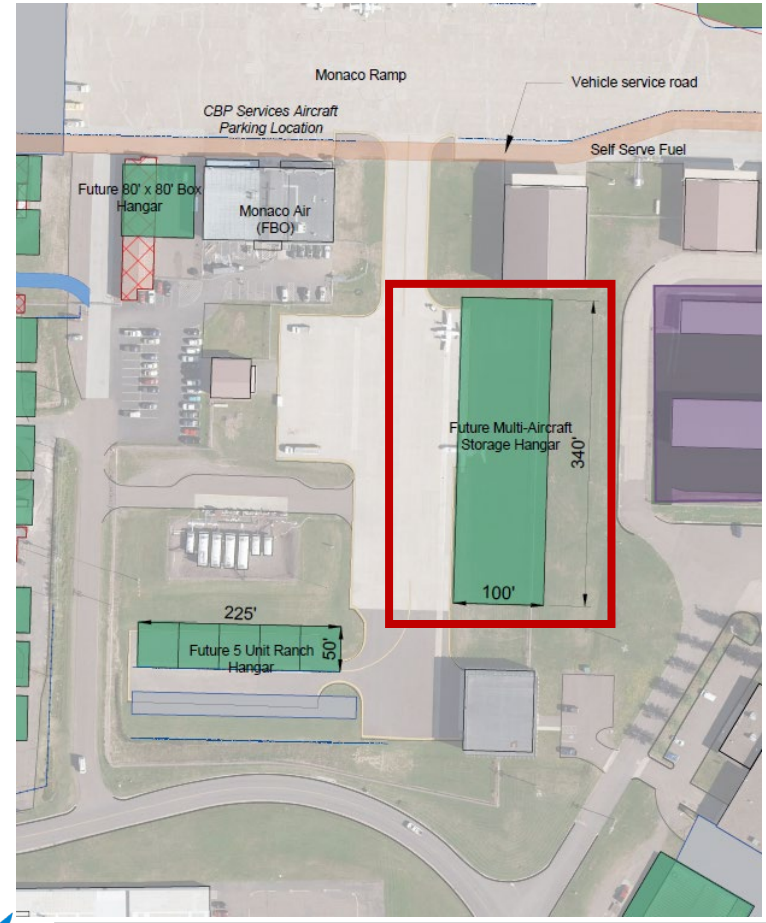
Opportunities

- Available for lease
- Demand for this type of hangar
- Opportunity for south facing doors

Challenges

- Limited site size

South of the Monaco Ramp
Multi-Unit Hangar Development



Availability: Shovel Ready – Under Lease by Tenant

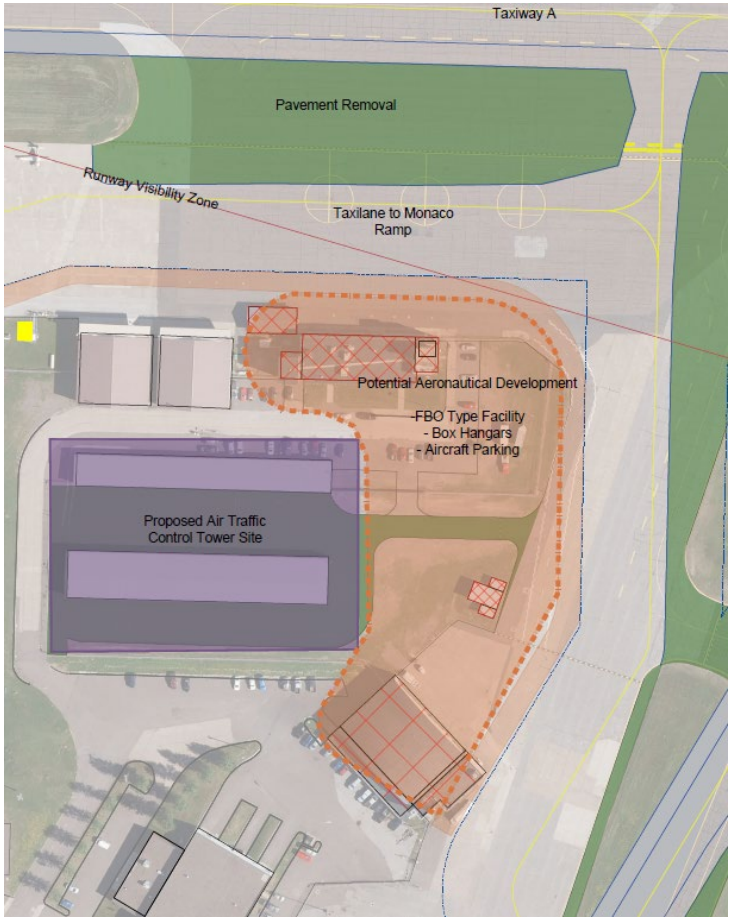
Opportunities

- Accommodates large multi-bay or multiple single hangars
- Potential for vehicle access to rear of hangar

Challenges

- Only accommodates up to 79' wingspan

Tower Ramp



Availability: Limited until the ATCT is relocated
(5-10+ years)

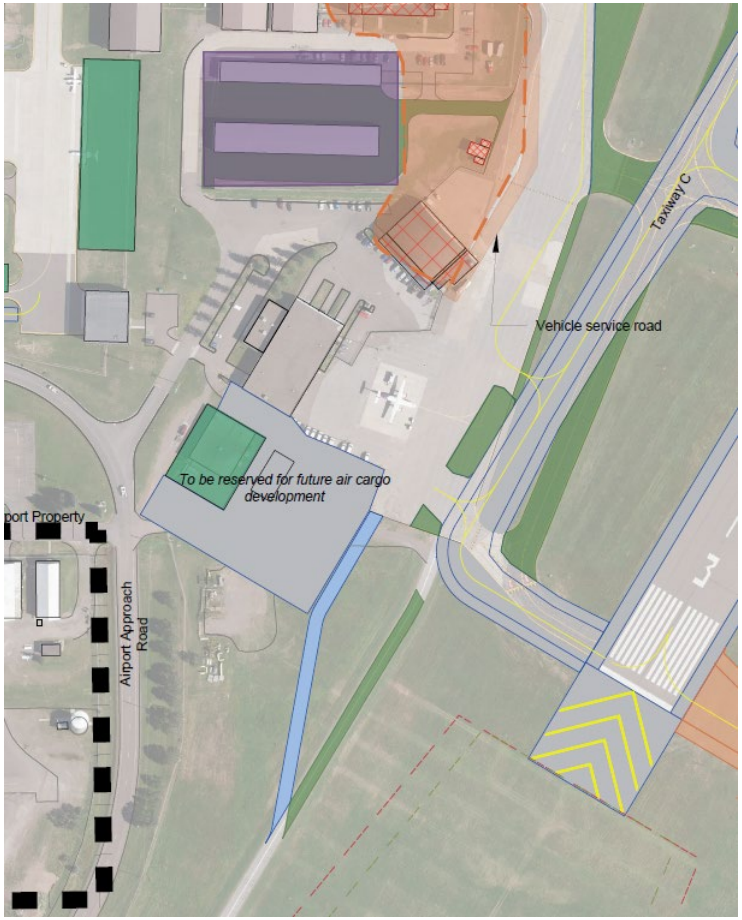
Opportunities

- Desirable location – direct airfield access
- Ability to accommodate hangars for larger wingspan aircraft (ADG III)
- Larger site development opportunities for an FBO, helicopter focused user, or other user type.

Challenges

- FAA ATCT Siting Study needed to fully inform ultimate site layout opportunities
- Limited site development opportunity in near-term
- Requires demolition of multiple structures

Cargo Ramp



Availability: Under long-term lease

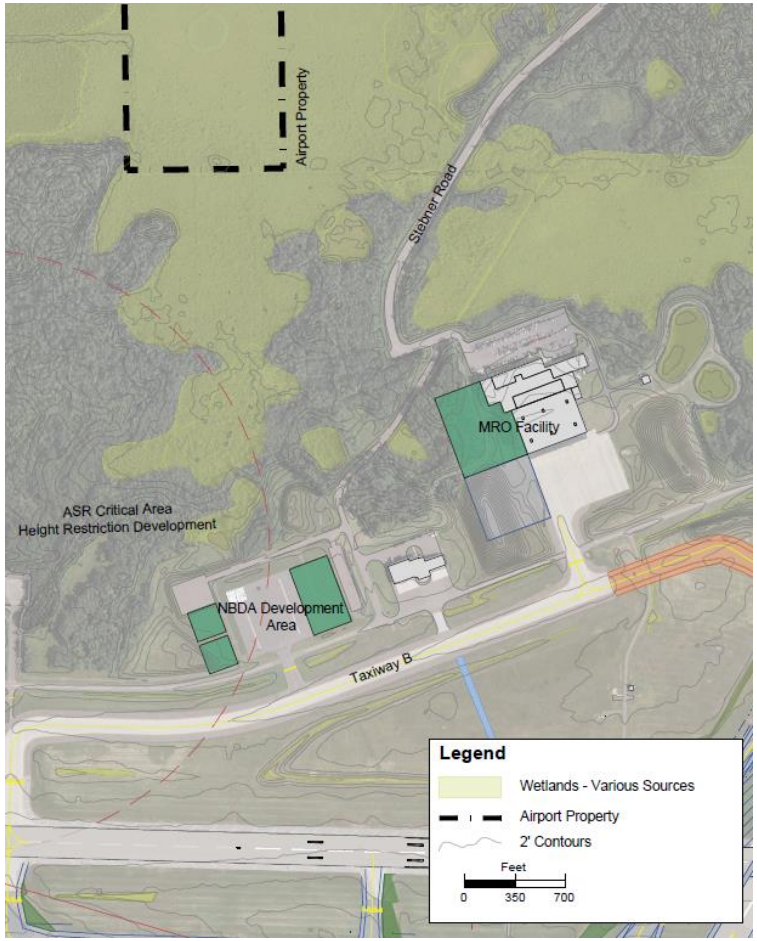
Opportunities

- Potential for tenant expansion

Challenges

- Site under long-term lease
- Limited revenue opportunities for DAA

North Business Development Area



~ 35 Acres

Availability:

- MRO Facility – Shovel Ready
- Hangar sites - Development rights are under lease

Opportunities

- Road Access
- MRO expansion opportunities
- Shovel ready
- Utilities adjacent to site

Challenges

- Site location/access

East of Runway 3-21

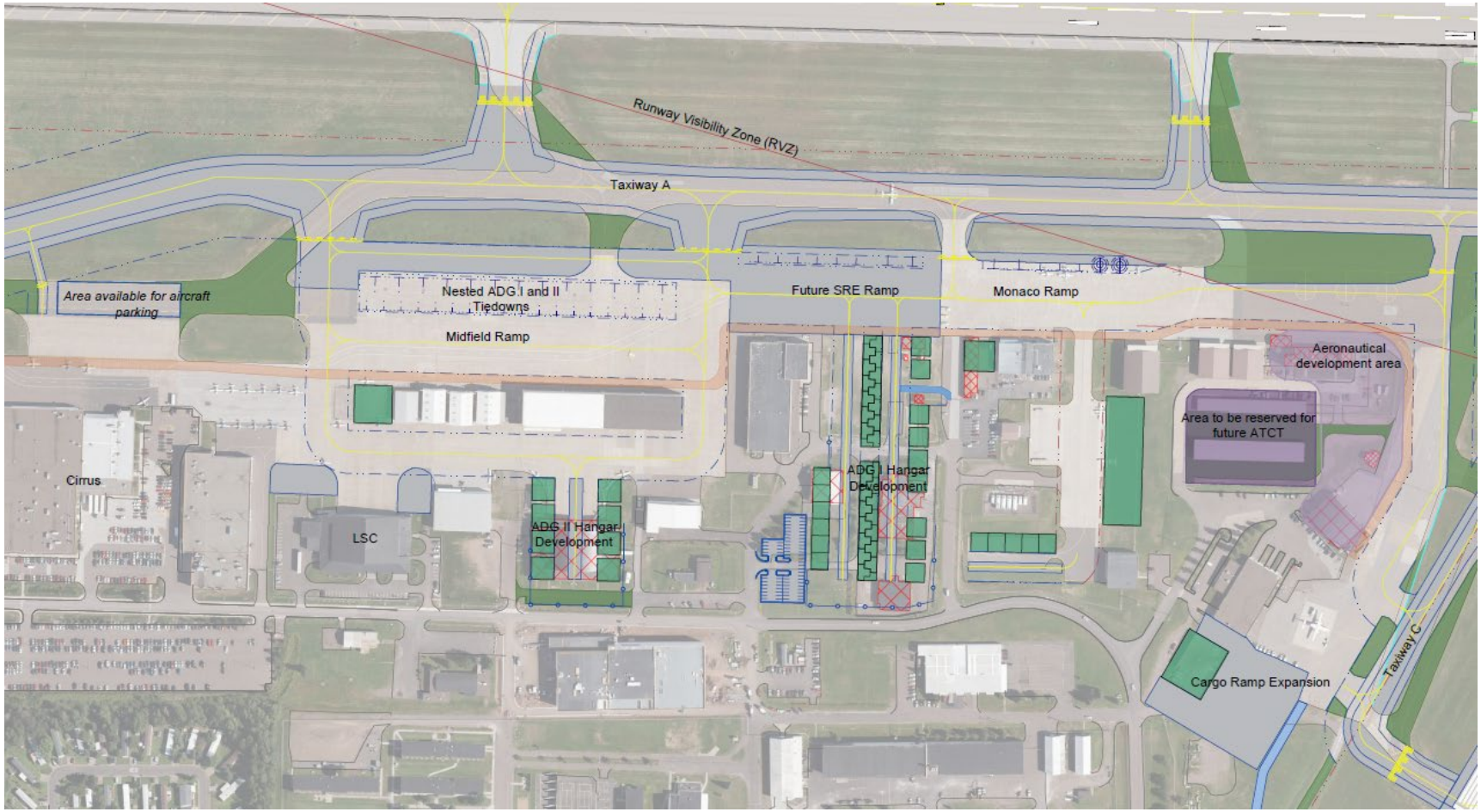
Availability

- Long-term after other sites have been developed and Taxiway D is extended south

Challenges

- Site location/access
- Wetlands
- Grading
- Utilities

Southwest Building Area



Mentimeter

CODE: 1598 2929

Next Steps

- Planning Process
  - Finalize Airport Master Plan Document – Fall 2021
  - Finalize Airport Layout Plan – Fall 2021

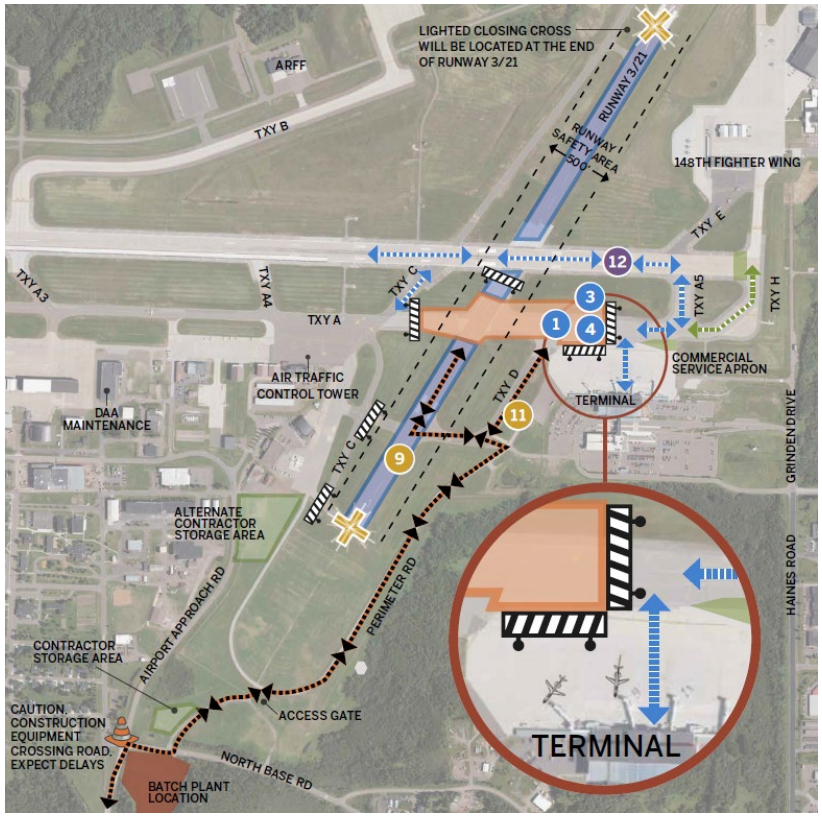
- Approvals
  - DAA Board Approval – Tentatively in December
  - FAA approval Spring 2022 (tentative)

- Public Outreach
  - January through Spring 2022

Thank You!

Phase 1 (1A) – 2022 Construction (Funded in 2021)

- Estimated Duration: 65 Days
- Airfield Closures
  - Runway 3-21
  - Portions of Taxiway A and Terminal Ramp
  - Taxiway D
- Instrument Approach Procedures for 9/27 will be raised to 1 mile



Phase 1 (1B) – 2022 Construction (Funded in 2021)

- Estimated Duration: 40 Days
- Airfield Closures
  - Portions of Taxiway A and Terminal Ramp
- Instrument Approach Procedures for 9/27 will be raised to 1 mile