



Hangar Development

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Building a Better World for All of Us®

INTRODUCTION



**MELISSA
UNDERWOOD**
Sr. Airport Planner



**ADINDA
VAN ESPEN**
Sr. Airport Engineer



ARIEL CHRISTENSON
Sr. Structural Engineer

MEETING OVERVIEW



INTRODUCTION



BEST PRACTICES



PLANNING ELEMENTS



*FUNDING &
BUSINESS PLANNING*



TYPES OF HANGARS



ACTION ITEMS



OWNERSHIP OPTIONS



PLANNING ELEMENTS

Know your demand

Hangar
Type

Five Years of
Documented
Need

Aircraft
Type

Hangar
Waiting
List

Provide
Expectations
and Lease
Types



PLANNING ELEMENTS

Identify critical aircraft

A-I



American Champion
Beech Bonanza 36
Cessna Skyhawk 172
Cessna Skywagon 205
Piper Cherokee PA 28

B-I



Beech King Air 90
Beech Queen Air 65
Cessna Golden Eagle 520
Citation Mustang C520
Piper Navajo

A-II & B-II



Air Tractor AT-502
Beech King Air 200
Citation I/Bravo C550
Hawker 800
Pilatus PC-12

C-II & D-II



Challenger 600
Citation X
Citation Sovereign
Embraer 345
Gulfstream GIV

A-III & B-III



Air Tractor ATR-72
Bombardier Dash 8
Global Express
Falcon 7X

C-III & D-III



Airbus A320
Boeing 737
Boeing MD-90
Bombardier CRJ-900
Embraer 175

C-IV & D-IV



Airbus A300
Boeing 757
Boeing DC-8
Lockheed Hercules C-130

D-V



Boeing 747
Boeing 777
Boeing Stratolifter B-52



PLANNING ELEMENTS

Separate Hangar Areas

Rice Lake Regional Airport



North hangar area:
Private development
Room for expansion

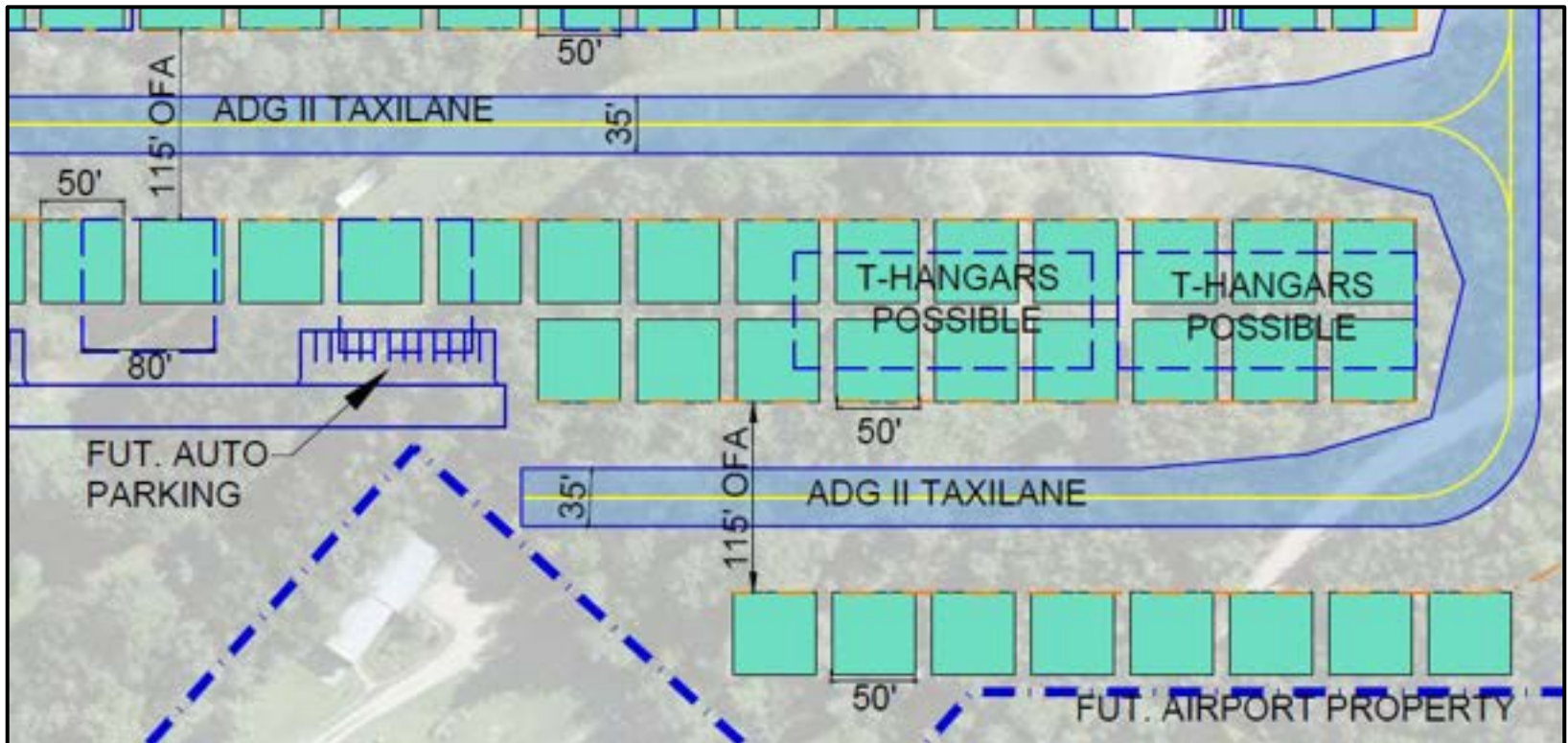


South hangar area:
Corporate development
Room for expansion



PLANNING ELEMENTS

Planning an adaptable ALP



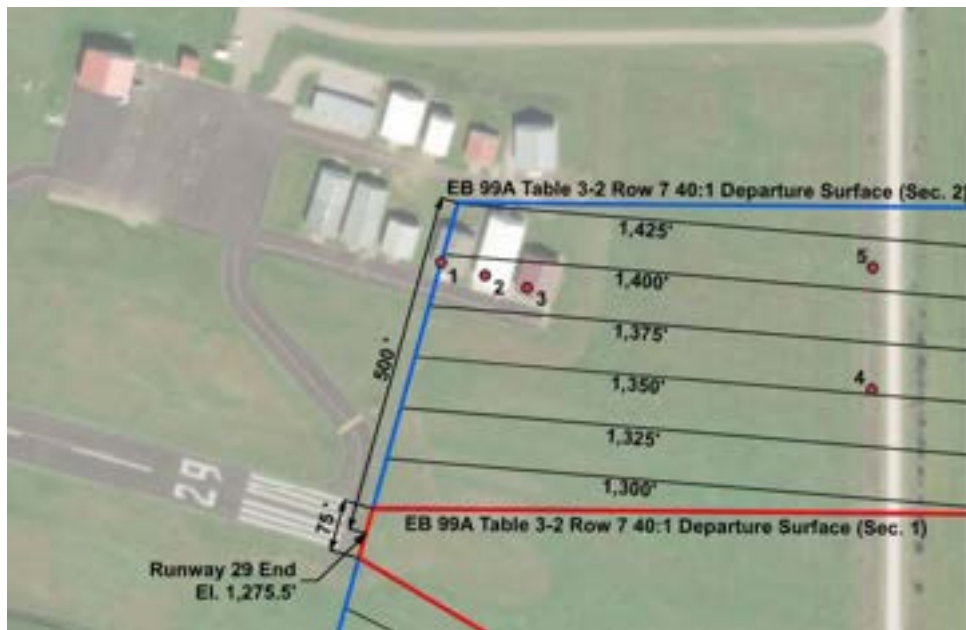


PLANNING ELEMENTS

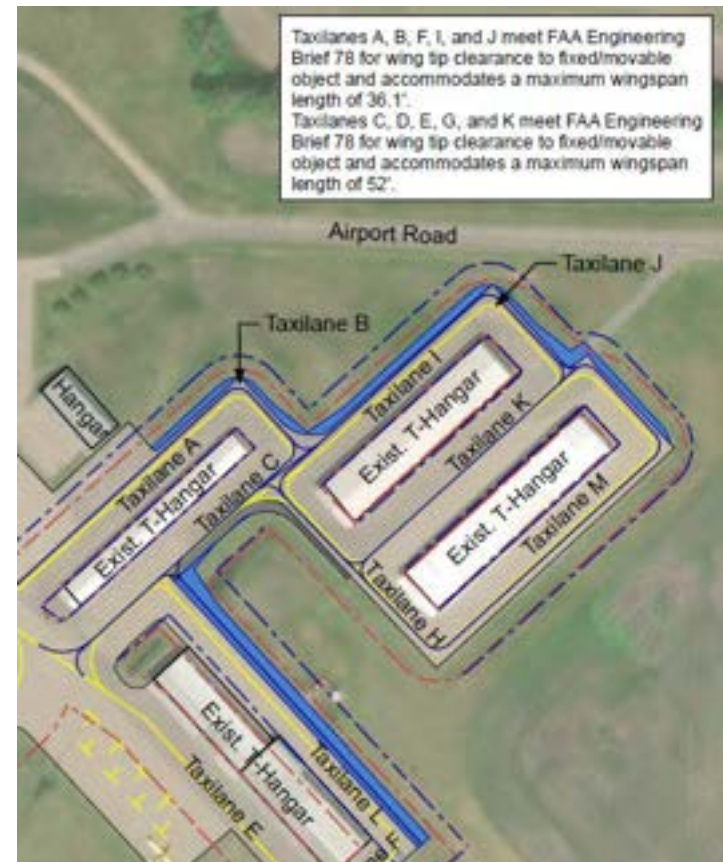
Building Area Constraints

- Airspace considerations
- Environmental impacts
- Change to design standards

Departure Surface



Modification to Standards





TYPES OF HANGARS

Box Hangar



Terminal Building & FBO





TYPES OF HANGARS

**Connected Box Hangars with
Large End Bay**



**T-Hangar with
Large Ranch End Unit**





TYPES OF HANGARS

Multi-Plane Box Storage Hangar



Multi-Bay Hangar with Different Door Heights





OWNERSHIP OPTIONS

Lease Considerations

- Type of lease
 - Land lease
 - Private hangar
 - Commercial hangar
 - Hangar lease
 - Private hangar
 - T-hangar
 - Large storage hangar
 - Individual leases
- Evaluate rate alternatives

2021 Spring AirTAP Virtual Series:

Understanding Lease Agreements

Airport Minimum Standards

[2021 AirTAP Virtual Education Spring Series | Airport Technical Assistance Program \(AirTAP\) \(umn.edu\)](#)



BEST PRACTICES



TVF Cargo Hangar



AIR CARGO CONNECTS THIEF RIVER FALLS TO THE GLOBAL ECONOMY

1.7 million in Digi-Key products & **20 percent** of all Digi-Key packages leave TVF by air *each day*.

Over 1 million outbound air cargo packages in 2018.

Outbound packages grew **over 60 percent** in 5 years.

Inbound packages grew **over 35 percent** in 3 years.





BEST PRACTICES



TVF Cargo Hangar



- Stakeholder engagement
 - Building should meet the needs of the user
 - Get it in writing
 - Visualization
 - Public eye
- Construction
 - Schedule / Procurement
 - Cost escalation
 - Temporary closures and downtime
 - Winter

BEST PRACTICES



TVF Cargo Hangar



- Programming / space needs
 - Design phases
 - Aircraft & equipment
 - “Future”-proofing!
 - Apron considerations
 - Floor elevation establishment
 - Phone a friend
- Meet funding source requirements
 - B3/Energy Use
 - Consider a financial consultant
 - Schedule should consider agency review times



BEST PRACTICES

Y49 Snow Removal Equipment Building





BEST PRACTICES

Y49 Snow Removal Equipment Building





BEST PRACTICES



Y49 Snow Removal Equipment Building

- Best Practices

- Reach out to other communities to see what they've done
- Determine if SRE building will come before or after equipment acquisition
- FAA sponsored equipment must be stored at airport
 - Cannot be used for any other purpose (such as City snow removal)
- Aesthetics to consider:
 - Any specific City/Sponsor requirements? (i.e. building color, roof type, door type, etc.)
 - Signage
 - Length of interior liner panel (half panel or full panel)
- Buy American requirements for federally funded projects
- If new building/location, reach out to local power/gas companies to see if they will install power/gas at no additional cost to the airport (get it in writing)
- Consider underground utilities and size up to allow for future development tap-in
- Consider in-floor drains



FUNDING & BUSINESS PLANNING

- Federal entitlement dollars can be used for hangar construction and/or BIL funding
- AIP Handbook – Hangar construction
 - Sponsor owned hangar that will increase the revenue producing ability of the airport.
 - Hangar pavement eligibility.
 - Utility costs: the installation, improvement, reconstruction, or repair of water, gas, and electric is allowable to the extent the work serves eligible areas and facilities and the utility is an allowable cost for the facility. Otherwise prorated.
 - Public use taxiways that serve multiple buildings are eligible using the same funding rules that apply to taxiways.



- CIP planning
 - Requirement to have all your airside needs met for the next 3 years to use AIP funding
 - Building costs are increasing, hangar projects are likely to use funding for many years
 - Plan for local share



ACTION ITEMS

- ✓ Review your Airport Layout Plan (ALP)
- ✓ Talk to your MnDOT/FAA representative
- ✓ Track your data – hangar needs, trends, aircraft waiting list
- ✓ Coordinate with your consultant/engineer
- ✓ Budget for your local share