

State Aviation System Plan



MINNESOTA GO

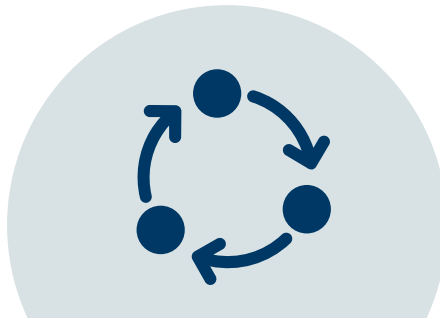
2022 Minnesota State Aviation System Plan

State Focus Areas | October 2023

2022 MnSASP Recommendations



Revise Prioritization
Methodology



Implement a Three-year
Revolving CIP Process



Staff Training



Develop and Adopt a
Grants Manual



Procure a MnDOT Grant
Management Program

State Aviation System Plan




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State Funding Prioritization Model

Project Selection Policy

- MnDOT recently adopted a policy requiring objective and transparent processes to “evaluate, prioritize, and select all capital projects”
- Policy dictates that project selection should be based on criteria assigning numeric scores for submitted projects
- Policy leaves room for discretion with scoring, **but reasoning must be provided for these project selection decisions**



Project Selection Policy

Policy #OE016
Revised: November 1, 2022

Policy Owner: Assistant Commissioner – Sustainability, Planning, and Program Management
Policy Contact: Project Selection Policy Coordinator, Office of Transportation System Management

Policy Statement

The Minnesota Department of Transportation will use objective and transparent processes to:

- evaluate, prioritize, and select all capital projects, except those exempted by this policy in the applicability section below;
- evaluate, prioritize, and select construction projects on the state highway system to be included in the Capital Highway Investment Plan (CHIP) and State Transportation Improvement Program (STIP);
- award grants for capital projects; and
- allocate funding or resources for capital projects, including trunk highway and general obligation bonds.

MnDOT will document and make publicly available for each selection process or program:

- criteria and process for assigning a numeric score and selecting projects
- list of candidate projects considered
- scores assigned to projects and reasoning behind selection decisions not included in the score

MnDOT has published the [Guide to MnDOT Highway Construction Project Selection](#) and the [Guide to MnDOT Capital Project Selection](#). The two guides include an overview of MnDOT’s project selection processes, including documentation on the scoring processes and criteria for each program. The guides are incorporated into this policy by reference. Additionally, programs that award grants for capital projects have additional requirements under the Grants Management Policy and Agency Grants Management Manual.

Use of Numeric Scores

MnDOT will use pre-determined, defined criteria to assign numeric scores in all selection processes subject to this policy. The numeric scores will inform project selection decisions, but MnDOT may consider other factors in addition to the numeric score. When MnDOT does not select a high scoring project or selects a lower scoring project, MnDOT will provide a short explanation for the reasoning behind the selection.

Reason for Policy

- Advance the Minnesota GO Vision and Statewide Multimodal Transportation Plan objective of Open Decision-Making
- Increase the transparency and public understanding of MnDOT’s project selection processes

State Funding Prioritization

- MnDOT Aeronautics updated the project prioritization methodology to comply with the Project Selection Policy
- Methodology provides an initial ranking for submitted capital improvement requests based on MnSASP priorities
- Based on available funds and latest Funding Rates Letter, MnDOT Aeronautics will select projects for state funding and provide explanation for any unique cases

State Funding Prioritization Model

- 2022 MnSASP developed a dynamic and customizable tool to allow for scenario-based analyses and customization based on future MnDOT Aeronautics needs
- Excel-based prioritization model for state/local funded airport capital improvement projects



! This model doesn't finalize any decisions for MnDOT Aeronautics. Additional review will be necessary to incorporate any specific funding considerations that cannot be configured into the model.

Scoring Criteria

System Plan Alignment

- Master Plan/ALP
- Airspace Obstructions
- Clear Zones
- Work Type
- Zoning

MnDOT Priorities

- Airport Component
- Licensing Compliance

Model Guide

MNDOT AERONAUTICS STATE FUNDING PRIORITIZATION MODEL GUIDE



Per MnDOT's Project Selection Policy, MnDOT Aeronautics is updating state funding prioritization to be as objective, transparent, and data-driven as possible. This policy is intended to consider Minnesota GO recommendations and increase public understanding of MnDOT's project selection processes.

SEVEN CRITERIA ON A 100-POINT SCALE

60 Points - System Plan Alignment

40 Points - MnDOT Priorities

System Plan Alignment

MnSASP Objective	Criteria	Categories	Score
Open Decision-Making	Master Plan/ALP* : Evaluates if the airport has an updated Master Plan/ALP following the MnSASP targets (by state classification) AND the project is included in the updated plan.	Updated ALP/Master Plan on-file and project request is included in plan	10
		Airport has programmed ALP/Master Plan update or in process of updating ALP/Master Plan	5
		Inadequate ALP/Master Plan with no updates programmed	-5
Transportation Safety	Airspace Obstructions* : Evaluates if the airport's Part 77 surfaces are clear of obstructions per MnDOT's airport licensing requirements OR the airport has an obstruction clearing project request.	Submitted project will clear obstructions in Part 77 surfaces	10
		Airport has no obstructions in Part 77 surfaces	5
		Airport has at least one submitted obstruction clearing project to alleviate Part 77 deficiencies	5
		Obstructions identified in Part 77 surfaces with no programmed fixes	-10
	Clear Zones* : Evaluates if MnDOT-defined clear zone are owned in 100 percent fee-simple or a MnDOT approved Clear Zone Acquisition Plan (CZAP) is on-file. This is per MnDOT's update to the Clear Zone Policy recommended by the 2022 MnSASP.	Submitted project will acquire land designated as MnDOT clear zones per Clear Zone Policy	10
		Airport has 100% clear zone ownership or approved CZAP on-file	5
		Airport has at least one submitted land acquisition project for MnDOT clear zones OR the airport is actively coordinating with MnDOT to file a CZAP	5
	Partial/no clear zone ownership without a CZAP on file and no programmed land acquisition or CZAP	-10	
System Stewardship	Work Type : Evaluates if the project is remediating a pavement condition deficiency per MnSASP-defined system metric*, preserving other existing airport assets, or constructing new/expanded infrastructure. Ultimately, MnDOT Aeronautics is prioritizing the preservation of existing assets rather than expansion.	Airport has an identified pavement condition deficiency (per MnSASP-defined system metric), and the project request will remediate the issue	20
		Airport has adequate pavement per MnSASP metric, and the project request is addressing other pavement issues	15
		Airport has adequate pavement, but the project request is maintaining other airport assets (ex: lighting)	10
		Project request is constructing new facilities or expanding existing infrastructure	0
		Airport has an identified pavement condition deficiency (per MnSASP-defined system metric) with no programmed fix	-10
Healthy Communities	Zoning* : Evaluates if the airport has proper zoning established and on-file with MnDOT Aeronautics or is in the process of establishing/updating zoning. This is evaluated as a MnSASP performance metric in the MnSASP Hub.	Airport has adequate zoning established and on-file per MnDOT requirements.	10
		Airport is establishing or updating zoning to comply with MnDOT requirements	5
		Airport does not have adequate zoning and hasn't programmed a project to mitigate	-10

The prioritization model is only considering state-only funding requests for MnDOT-defined capital expenditures.

MnDOT Priorities

Criteria	Categories	Score
Airport Component : This is indicating where the project is being directed to at the airport, ranging from primary runway to unknown.	Primary Runway	20
	Taxiway Serving Primary Runway	18
	Secondary Runway	16
	Apron	14
	Taxiway Serving Secondary Runway	14
	Other Airfield Location	12
	Taxilane	10
	Terminal Building or Fuel Facilities	8
	Hangar	6
	Other Buildings	6
	Landside	4
Unknown	0	
Licensing Compliance : This is evaluating whether the airport requesting state funds complies with all state licensing standards dictated in Rules (Minnesota Rules 8800.1600 Public Airport Licensing) OR has a project request to remediate a licensing deficiency.	Project alleviates a state licensing deficiency	20
	Airport compliant with all state licensing standards	10
	State licensing deficiency identified, and another project alleviates deficiency	10
	N/A (Part 139 Airports)	10
	Airport has state licensing deficiency and no programmed fix	-10

*The indicated criteria are evaluated as MnSASP performance metrics. System and airport performance is measured and presented in two interactive dashboards included in the MnSASP Hub: <https://mnsasp-mndot.hub.arcgis.com/>



State Aviation System Plan



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Model Scenario: Case Study

Model Scenario: Airport A

Existing Deficiencies

- Airspace obstructions present
- Last ALP updated in 2000
- Deficient pavement conditions per MnSASP system metric

2024 CIP

- **Obstruction Removal**
- **Corporate Hangar Construction**
- **Fuel System Chip Card Reader**
- **Runway Lighting Improvements**

Existing Conditions

State Classification: Intermediate Large Single-runway facility

Model Scenario: Airport B

Existing Deficiencies

- Airspace obstructions present
- Deficient airfield pavement per MnSASP system metric
- 95% clear zone ownership, no CZAP on-file
- Outdated airport zoning
- No public restrooms available

2024 CIP

- **Pavement Maintenance - Commercial Apron**
- **Crack Seal Airfield Pavements**
- **Airport Zoning Update**
- **Replace Two Large Hangar Doors**

Existing Conditions

State Classification: Intermediate Large Single-runway facility

Master Plan/ALP Scoring Scenario

Airport A

- Last ALP update in 2000, with no update programmed
- MnSASP metric requires intermediate large airports to update their ALP at least every 15 years
- **All projects receive -5 points from this criteria**

Airport B

- ALP updated and all 2024 CIP projects included in latest ALP
- **All projects receive 10 points**

10

Updated ALP/Master Plan on-file and project request is included in plan.

5

Airport has programmed ALP/Master Plan update or in process of updating ALP/Master Plan

-5

Inadequate ALP/Master Plan with no updates programmed.

Airspace Obstructions Scoring Scenario

Airport A

- Obstruction removal project receives 10 points
- With at least one obstruction clearing project programmed, **all other projects received 5 points**

Airport B

- Obstructions exist, but the airport has no programmed fixes
- **All projects are deducted 10 points**

10

Submitted project will clear obstructions in Part 77 surfaces

5

Airport has no obstructions in Part 77 surfaces OR Airport has at least one submitted obstruction clearing project to alleviate Part 77 deficiencies

-10

Obstructions identified in Part 77 surfaces with no programmed fixes

Clear Zones Scoring Scenario

Airport A

- No clear zone deficiencies, so **all projects receive 5 points**

Airport B

- Airport has incomplete ownership of clear zones and no CZAP on-file
- **All projects are deducted 10 points**

10

Submitted project will acquire land designated as MnDOT clear zones per Clear Zone Policy

5

Airport has 100% clear zone ownership or approved CZAP on-file OR airport has at least one submitted land acquisition project for MnDOT clear zones OR the airport is actively coordinating with MnDOT to file a CZAP

-10

Partial ownership and no planned or programmed CZAP

Work Type Scoring Scenario

Airport A

- Deficient pavement conditions with no fix programmed
- **All projects are deducted 10 points**

20

Airport has an identified pavement condition deficiency (per MnSASP-defined system metric), and the project request will remediate the issue

15

Airport has adequate pavement per MnSASP metric, and the project request is addressing other pavement issues

10

Airport has adequate pavement, but the project request is maintaining other airport assets (ex: lighting)

Airport B

- Crack Seal Airfield Pavements receive 20 points for fixing deficient airfield pavement
- Pavement Maintenance – Commercial Apron receives 15 points for addressing other pavement issues
- Replace Two Large Hangar Doors is maintaining other airport assets, so this project receives 10 points

0

Project request is constructing new facilities or expanding existing infrastructure

-10

Airport has an identified pavement condition deficiency (per MnSASP-defined system metric) with no programmed fix

Zoning Scoring Scenario

Airport A

- Airport zoning established, adequate per MnDOT requirements, and on-file with MnDOT Aeronautics
- **All projects receive 10 points**

Airport B

- Airport zoning update programmed
- **All projects receive 5 points**

10

Airport has adequate zoning established and on-file per MnDOT requirements.

5

Airport is establishing or actively updating zoning to comply with MnDOT requirements

-10

Airport does not have adequate zoning and hasn't programmed a project to mitigate.

Airport Component Scoring Scenario

Airport A

- Obstruction Removal – receives 20 points for being associated with the primary runway
- Runway Lighting Improvements receives 20 points
- Fuel System Chip Card Reader receives 8 points
- Corporate Hangar Construction receives 6 points

Airport B

- Crack Seal Airfield Pavements receive 20 points for being applied to runway*
- Pavement Maintenance – Commercial Apron receives 14 points
- Replace Two Large Hangar Doors receives 6 points

*MnDOT CIP system has “runway” indicated with project

Licensing Compliance Scoring Scenario

Airport A

- Obstruction removal project **receives 20 points**
- With at least one obstruction clearing project programmed, **all other projects received 10 points**

Airport B

- No public restrooms available and no CIP-programmed or local fix planned
- **All projects receive -10 points**

20

Project alleviates a state licensing deficiency

10

Airport compliant with all state licensing standards.

State licensing deficiency identified, and another project alleviates deficiency.

N/A (Part 139 Airports)

-10

Airport has state licensing deficiency and no programmed fix

Final Comparison

Project	Airport	Master Plan/ALP	Airspace Obstructions	Clear Zones	Work Type	Zoning	Airport Component	Licensing Compliance	TOTAL
Obstruction Removal	A	-5	10	5	-10	10	20	20	50
Runway Lighting Improvements	A	-5	5	5	-10	10	20	10	35
Crack Seal Airfield Pavements	B	10	-10	-10	20	5	20	-10	25
Fuel System Chip Card Reader	A	-5	5	5	-10	10	8	10	23
Corporate Hangar Construction	A	-5	5	5	-10	10	6	10	21
Pavement Maintenance - Commercial Apron	B	10	-10	-10	15	5	14	-10	14
Replace Two Large Hangar Doors	B	10	-10	-10	10	5	6	-10	1

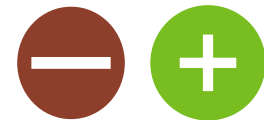
State Focus Areas



**Through-the-Fence
Operations**



**Last-Mile
Connectivity**



**Airport Closure and
New Airport
Entrants**



**Hangar Availability
and Funding**



**Crosswind
Runways**



Clear Zones

Presentation of Findings

Compliance Documents

- Reason for Guidance
- Applicability
- Definitions
- Responsibilities
- Compliance process

White Papers

- Literature and Guidance Review
- Existing Conditions in MN
- MnDOT Aeronautics Guidance to Airports

State Aviation System Plan



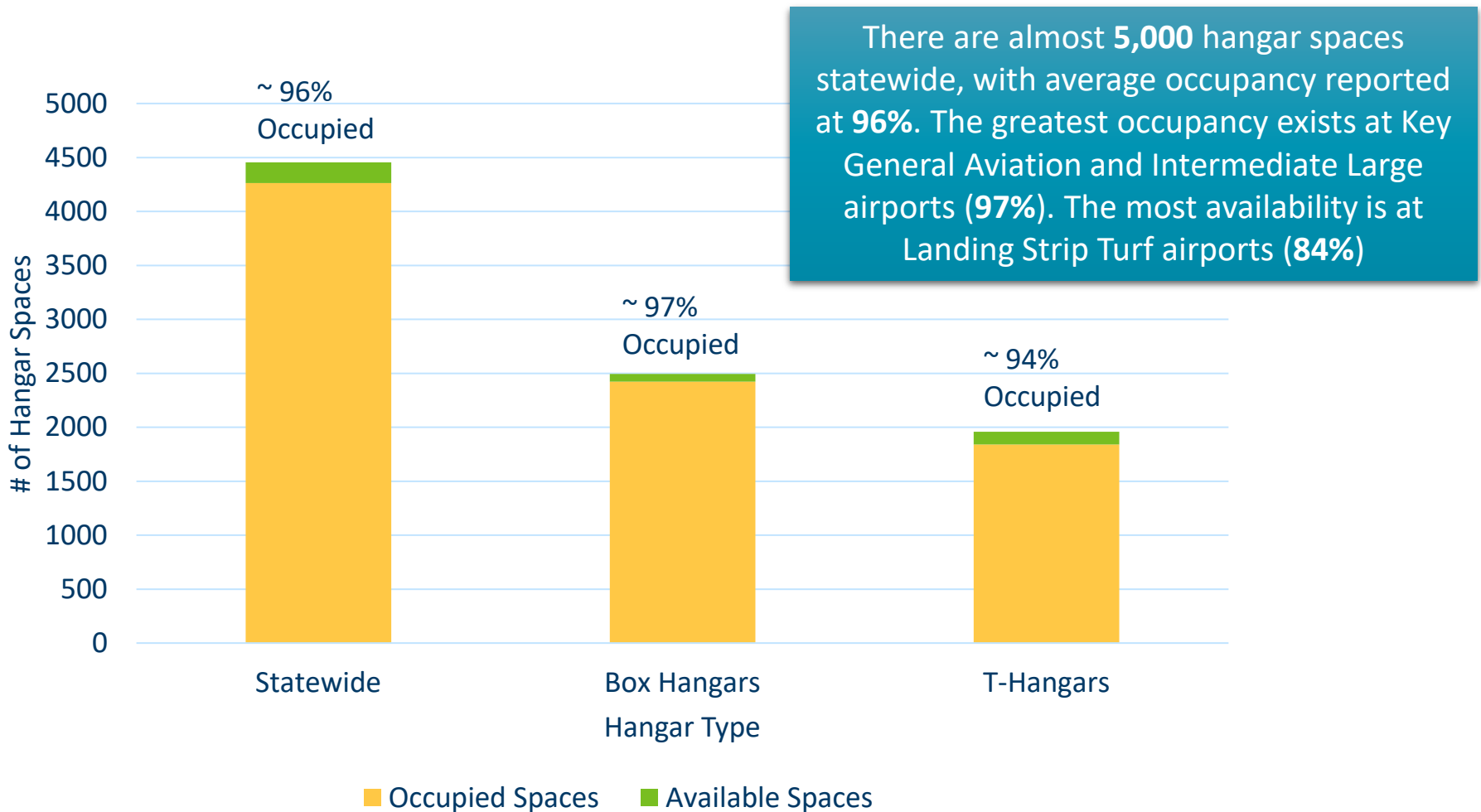
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Hangar Availability & Funding Participation

MnSASP Role

- Phase I identified a lack of aircraft hangars available for users of the Minnesota state aviation system
- The 2022 MnSASP embarked on a comprehensive data collection effort to understand the scope of the issue:
 - Review of existing system capacity, occupancy, and rates/charges
 - Evaluate systemwide hangar needs
 - Assess existing hangar funding mechanisms available to Minnesota airports
 - Examine hangar funding mechanisms in other states
- This information was used to inform and develop several recommendations for MnDOT Aeronautics and airport sponsors to consider

Existing Hangar Facilities



With the limited occupancy data provided by airports, the totals are not reflective of the total hangar capacity (4,998 spaces). This chart is based on 124 airports with available occupancy data.

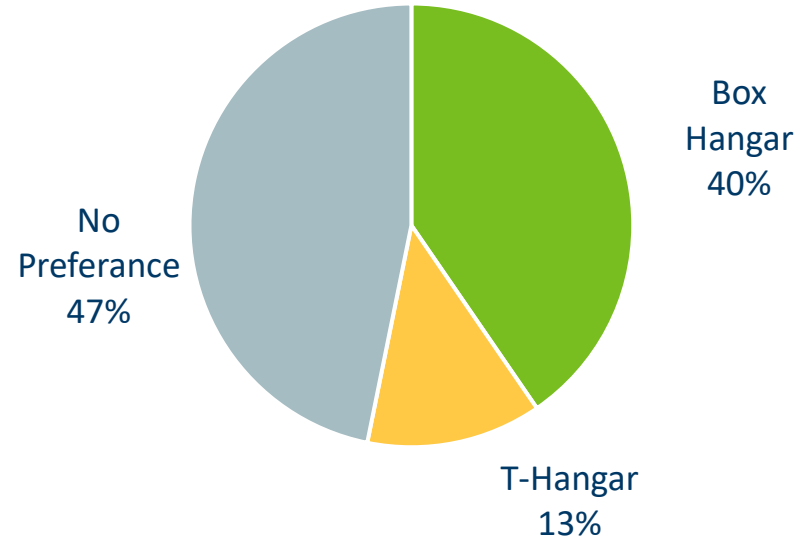
Aircraft Owner/Pilot Outreach

- 2022 MnSASP collected hangar waitlists from **24 airports** including **309 waitlisted individuals**
 - 176 have sufficient contact information recorded
 - **Only 47 pilots/owners confirmed a current need for hangar storage**
- Several hangar waitlists lacked contact information or listed individuals that no longer need a hangar

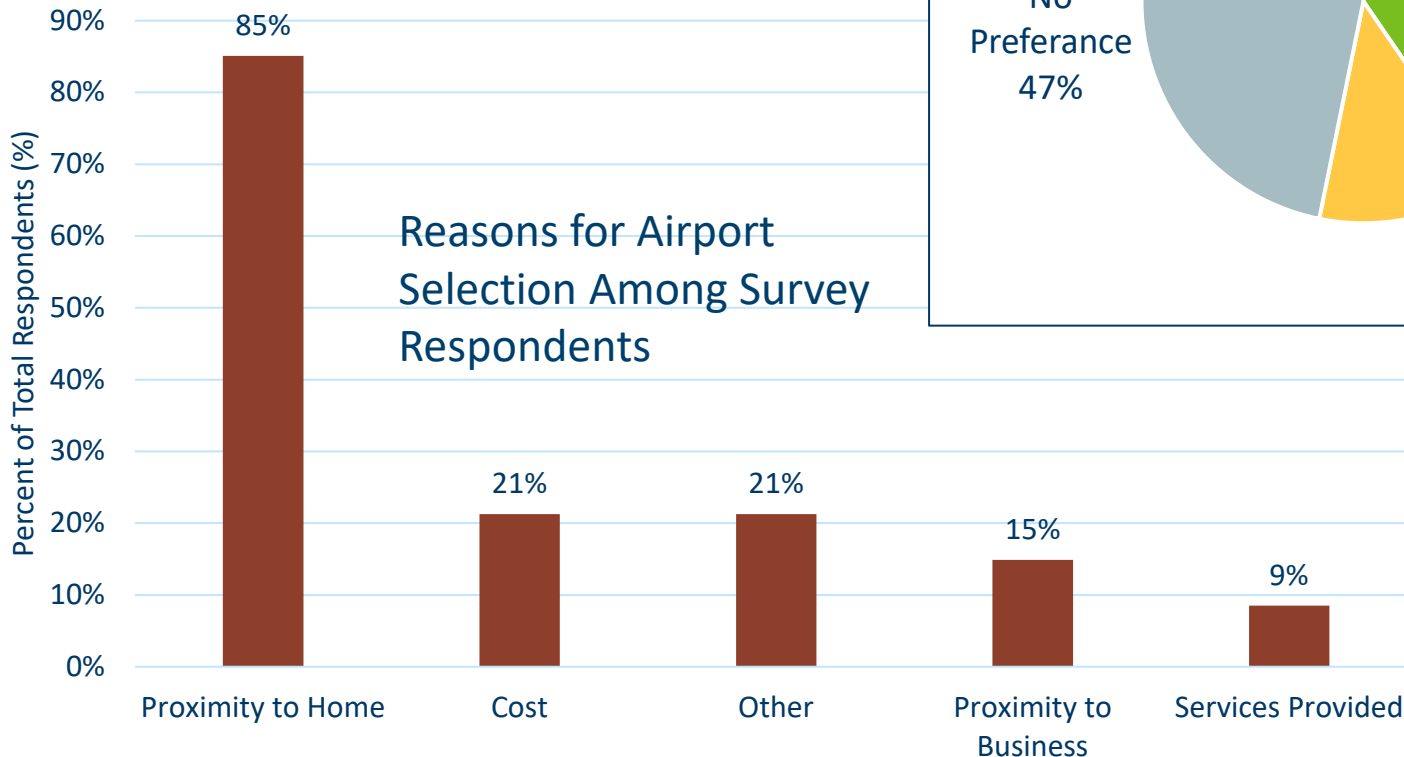
System Hangar Needs

The MnSASP completed an outreach effort with **47** aircraft pilots and owners that confirmed an active need for hangar storage.

Most Requested Hangar Type



Reasons for Airport Selection Among Survey Respondents



Rates and Charges Review

State Classification	Box Hangars	T-Hangars
Key Commercial Service	\$1,165 (5 airports)	\$155 (6 airports)
Key General Aviation	\$1,247 (11 airports)	\$244 (13 airports)
Intermediate Large	\$483 (12 airports)	\$137 (17 airports)
Intermediate Small	\$341 (12 airports)	\$108 (28 airports)
Landing Strip Turf	\$140 (2 airports)	\$50 (1 airport)

AIRPORT LOCATION	T-HANGAR AVERAGE COST / SF	NON-AERONAUTICAL, OFF-AIRPORT STORAGE AVERAGE COST / SF
Southwest	\$0.06	\$0.37
Northwest	\$0.13	\$0.43
North Central	\$0.16	\$0.36
Central	\$0.11	\$0.34
Iron Range	\$0.14	\$0.38

Several airports set their hangar lease rates significantly below comparable off-airport storage options

Current Hangar Funding Mechanisms

State Programs

- State Hangar Loan Revolving Account Program
- State Construction Grant Program
- State Maintenance and Operations Grant Program
- Airport Infrastructure Renewal Program

Federal Programs

- FAA Airport Improvement Program
- U.S. Economic Development Administration

Other Hangar Funding Programs

- The 2022 MnSASP reviewed the hangar funding mechanisms administered across 10 other states to identify best practices
- Some takeaways that MnDOT Aeronautics could consider include:
 - Require airports to provide a documented hangar waitlist to demonstrate an explicit need
 - Establish a scoring system that considers project readiness, planning, funding sources, economic impact etc.
 - Set specific funding levels based on state classification and the type of hangar project request
 - Add repayment grace period to loan program

Key Issues Identified

Lack of Hangar Availability Across Select Airports

Non-Aeronautical Use of Hangars

Current Hangar Lease Rates Are Inadequate to Cover the Cost of Development and Maintenance

Hangar Revolving Loan Program Does Not Evaluate True Hangar Needs

Hangar Revolving Loan Program Disburses Funding On A First-Come, First Serve Basis

Lack of Hangar Availability

Several airports, pilots, and aircraft owners cited long hangar waitlists due to lack of hangar availability statewide

Recommendations for MnDOT Aeronautics

Consider revising or adopting alternative funding strategies (e.g., grace period for loan program, new grant program)

Address cases of non-aeronautical hangar usage by prioritizing aeronautical users

Non-Aeronautical Use of Hangars

- Several pilots/owners cited non-aeronautical use of hangars that are discouraging aviation users and perpetuating the lack of hangars
- FAA policy states that airport sponsors are required to charge fair market value

Recommendations for MnDOT Aeronautics

Include provision in hangar revolving loan program requiring all existing hangars be used for aeronautical purposes

Require airports to adopt minimum standards that restrict or prohibit non-aeronautical use

Hangar Lease Rates

Existing aircraft hangars were discovered to have very low lease rates to not adequately cover construction and maintenance costs

Recommendations for MnDOT Aeronautics

Consider requiring airports to establish market rent based on the project cost, ancillary improvements made, and/or other comparable hangar lease rates*

Account for different hangar characteristics and market fluctuations

Incorporate hangar lease rate structure within the airport's overall financial planning

Evaluating True Hangar Need

- MnDOT Aeronautics has been generally awarding state funds to hangar projects on a first come, first serve basis
- Airports should demonstrate true hangar-related need for aeronautical usage

Recommendations for MnDOT Aeronautics

Establish numerical-based prioritization structure for available funding

Require airports to submit a validated hangar waitlist

Require airports to submit a business plan outlining the need for hangars, details on development and maintenance plans, financial assessment

Validated Hangar Waitlist

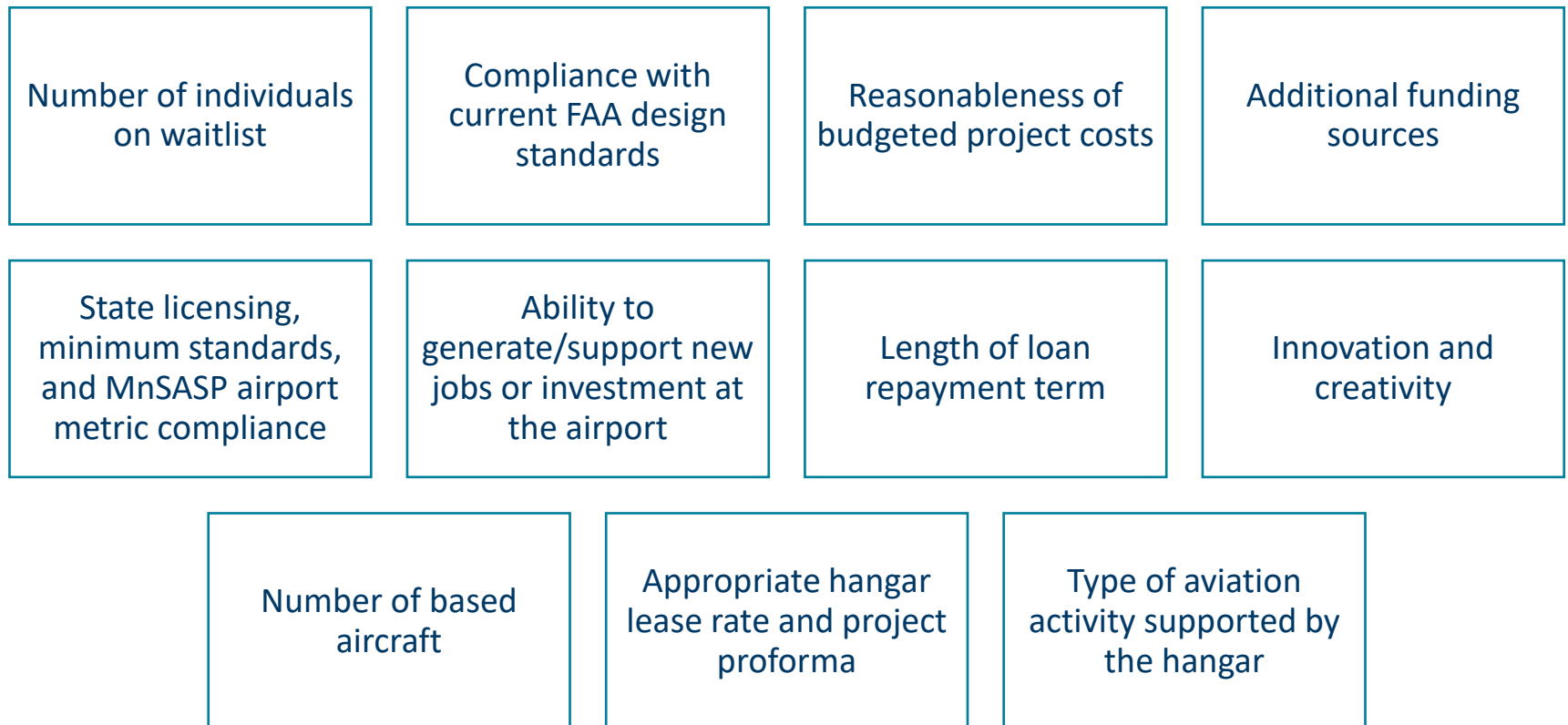
To demonstrate true need for hangars, airports could be required to submit a validated hangar waitlist

Validated Hangar Waitlist

- Date of inquiry (initial and ongoing check-ins)
- Contact information of interested party (name, phone, email)
- Size/type of hangar requested
- Amenities requested with hangar (utilities, heated, etc.)
- Aircraft N-number (to identify new or shifting demand)
- Aircraft type (make, model)
- Aircraft status (owned or new purchase)
- Current location of aircraft
- Note any fees incurred to be included on waitlist
- Letter(s) of intent

Funding Prioritization Structure

MnDOT Aeronautics could adopt a numerical-based prioritization methodology for hangar funding requests, incorporating these potential criteria:



State Aviation System Plan



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Crosswind Runways

Crosswind Runways

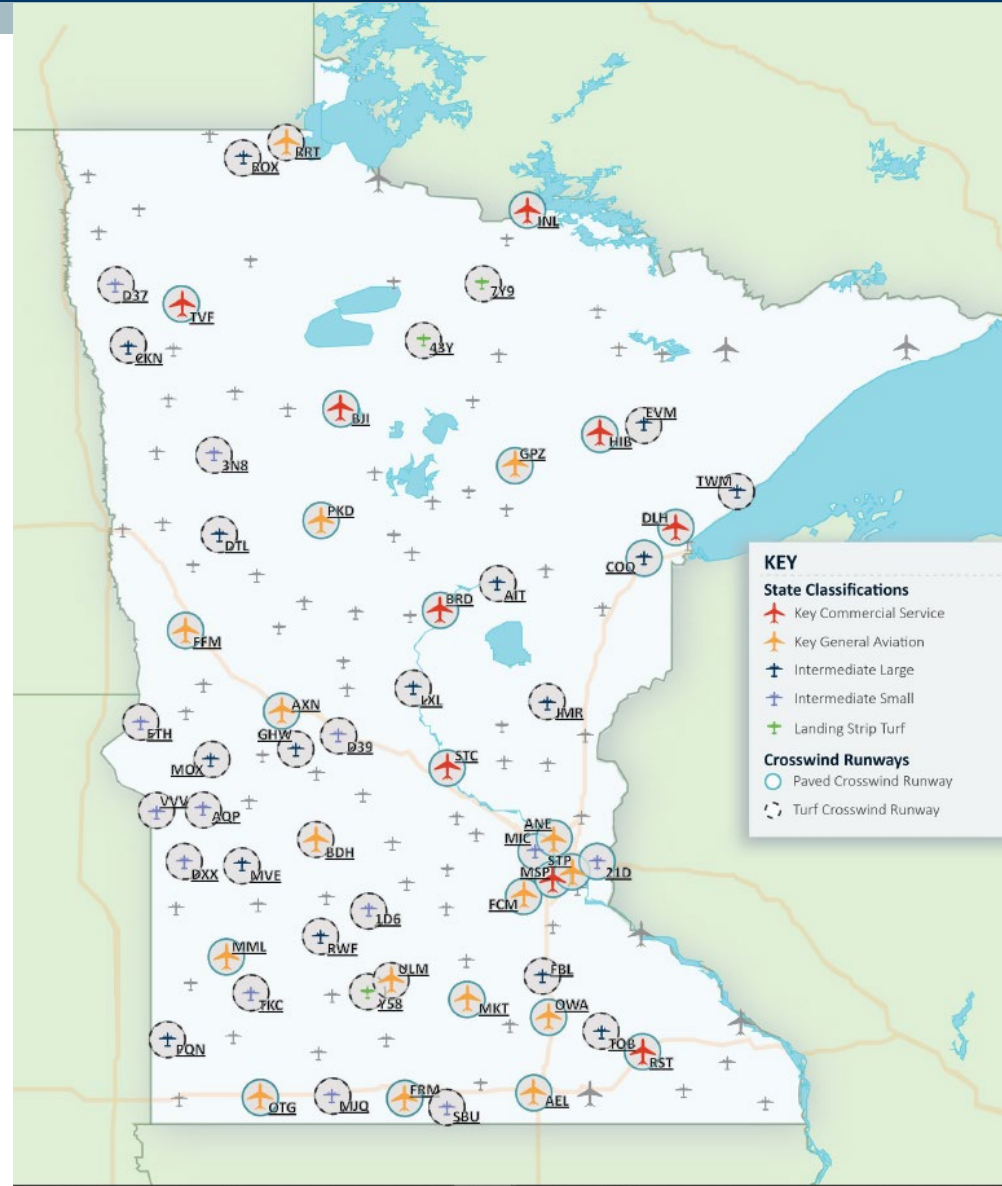
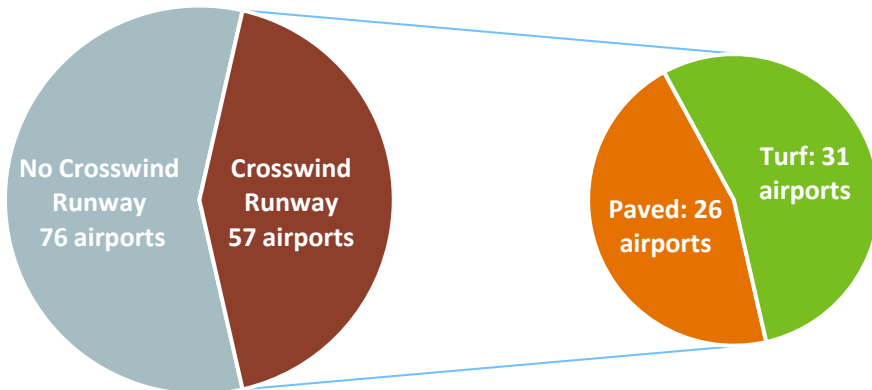
- Enable continuous support of aviation demand in variable weather conditions
- Typically constructed in airport environments where the primary runway orientation captures less than 95 percent wind coverage*



*The FAA's Airport Improvement Program provides federal funds to crosswind runway development where airports can demonstrate less than 95% existing wind coverage
Airport Shown: Southwest Minnesota Regional Airport (MML)

Minnesota Airport System

133 publicly owned,
public-use airports in
Minnesota



Crosswind Runway Analysis



- ✓ Developed the Excel-based Minnesota Crosswind Runway Eligibility Model (MCREM) as a tool to assist in the prioritization of state funding for crosswind runways
- ✓ Airports need to be eligible and justified in their requests for state funding of crosswind runways by submitting a Crosswind Runway Justification Report (CRJR) that airports can submit to MnDOT Aeronautics



Crosswind Runway Guidance

- ❖ Airports need to be eligible and justified in their requests for state funding of crosswind runways by submitting a Crosswind Runway Justification Report (CRJR) that airports can submit to MnDOT Aeronautics*
- ❖ Eligibility for state funding initially evaluated through the MCREM
 - Airports scoring ≥ 1.5 are immediately eligible to submit a state funding request through a CRJR
 - Airports scoring < 1.5 can submit an Exception Request to document how the MCREM does not adequately reflect current/future conditions



Airport Shown: Mahnomon County Airport (3N8)

MCREM Overview

- ❖ Developed the Excel-based Minnesota Crosswind Runway Eligibility Model (MCREM) as a numerical-based scoring tool to assist in the prioritization of state funding for crosswind runways (available on mnsasp.org)
- ❖ Four criteria are utilized to generate scores for each airport
 - Existing Crosswind Runway
 - Least Favorable Wind Percentage Coverage*
 - State Classification
 - Proximity to Paved Crosswind Runway

The Focus Area Working Group guided the development of the MCREM by:



- Identifying the top criteria to evaluating the need for a crosswind runway
- Assigned specific weights to each criteria to indicate relative importance to each other

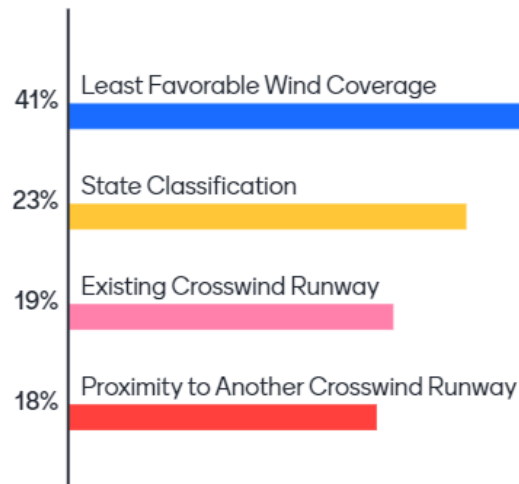
*Compares the average wind coverage in the summer (April – October) vs winter (November – March) based on the Iowa Environmental Mesonet Airport Shown: Sleepy Eye Municipal Airport (Y58)

Working Group Feedback



- A working group was convened to solicit input on:
 - MCREM criteria, weighting, and score threshold for state funding eligibility
 - Process for airports to add justification to their state funding request for crosswind runways (including the requirements for a crosswind runway justification report [CJRJ])

For the following criteria, please assign a score to weight each criteria against one another.



MCREM Weather Data

IOWA STATE UNIVERSITY
Iowa Environmental Mesonet

Search

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Archive | Climate | Current | Info | GIS | Networks | Roads | Svr Wx | Webcams

ASOS Network / ASOS-AWOS-METAR Data Download

The IEM maintains an ever growing archive of automated airport weather observations from around the world! These observations are typically called 'ASOS' or sometimes 'AWOS' sensors. A more generic term may be METAR data, which is a term that describes the format the data is transmitted as. If you don't get data for a request, please feel free to [contact us](#) for help. The IEM also has a one minute interval dataset for [US ASOS](#) (2000-) and [Iowa AWOS](#) (1995-2011) sites. This archive simply provides the as-is collection of historical observations, very little quality control is done. More details on this dataset are [here](#).

Tools/Libraries
Here is a [python script example](#) that automates the download of data from this interface. A community user has contributed [R language](#) version of the python script. There is also a [riem R package](#) allowing for easy access to this archive.

This archive contains processed observations up until **2020-10-30T16:22:41Z**. Data is synced from the real-time ingest every 10 minutes.

Please be patient with this page as it will take a number of seconds to process your request and provide the result.

Select Network (Minnesota ASOS) | Switch to Network

1) Select Station/Network by clicking on location:
If you select no stations, you can download up to a 24 hour period of all data available from this archive!

Select Widget for MN_ASOS Network | Station Metadata

Sort Available Stations: [04W] Hinckley, [14V] Long Prairie, [21O] St Paul / Lake Elmo, [3M8] Mahanomen

Selected Stations:

2) Select From Available Data:

- All Available
- Air Temperature [F]
- Air Temperature [C]
- Dew Point [F]
- Dew Point [C]
- Relative Humidity [%]
- Heat Index/Wind Chill [F]
- Wind Direction
- Wind Speed [knots]
- Wind Speed [mph]

3) Specific Date Range (if needed):
Note: There is up to an hour delay for observations to appear within this service. A process runs at approximately 20 minutes after the hour to copy over the previous hour's worth of data in the backend database behind this service.

Start Date: 2020 | January | 1 |
End Date: 2020 | October | 30 |

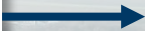
4) Timezone of Observation Times:
The following options are available for how the observation time is presented:
Coordinated Universal Time (UTC)

5) Download Options:
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Include Latitude + Longitude? [No]
How to represent missing data? [Use 'M']
How to represent Trace reports? [Use 'T']
View result data in web browser

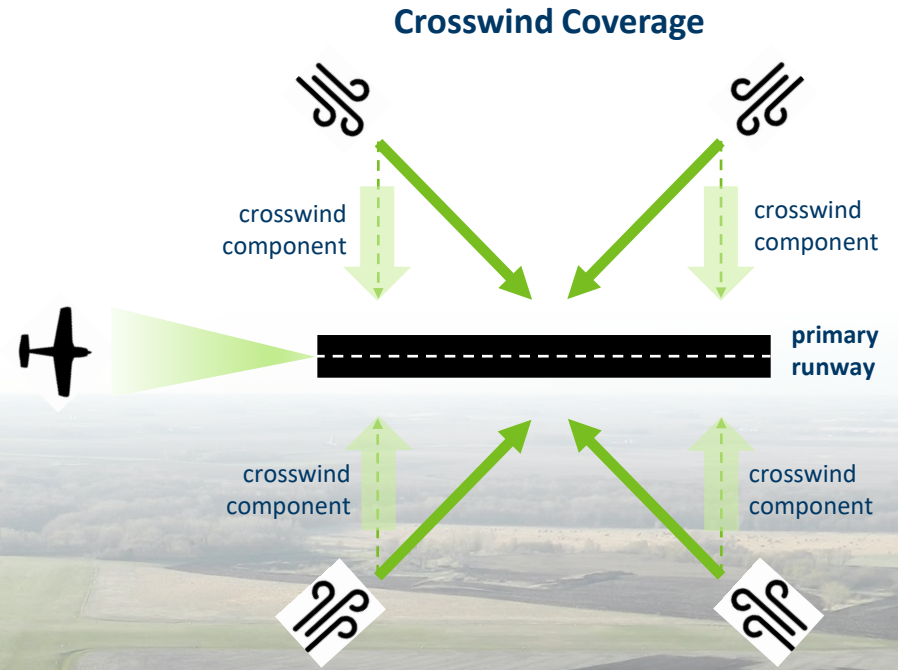
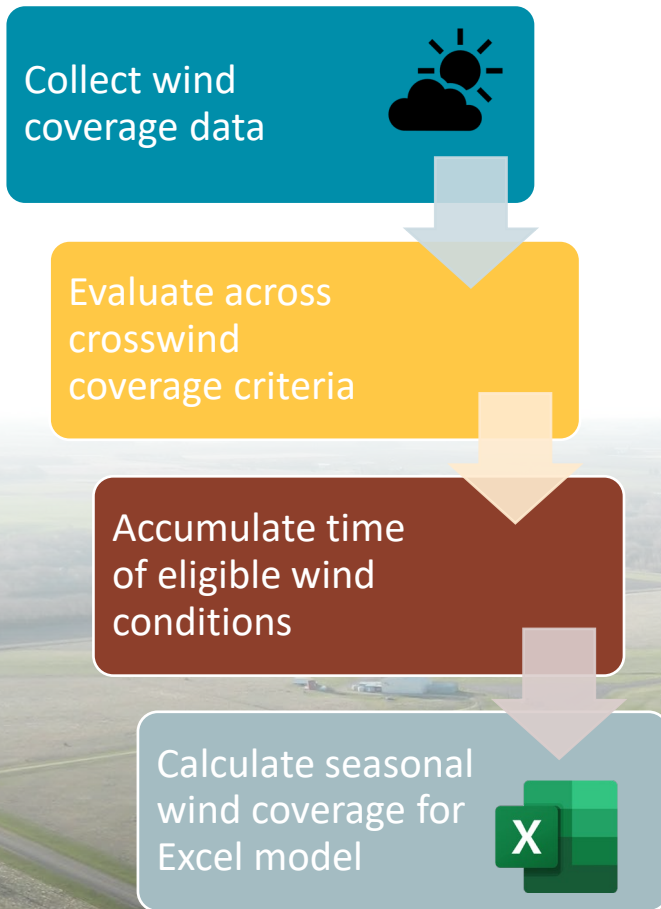


Extracted weather data for each airport between 2019 and 2020

Station	Date/Time	Wind Direction	Wind Speed (kts)	Visibility (nmi)	Wind Gust (kts)	Peak Wind Gust (Kts)	Peak Wind Gust (mph)	Peak Wind Direction
DLH	1/2/2020 19:39	300	15	7	25	28	32.2	280
DLH	1/2/2020 19:55	290	19	7	25	28	32.2	280
DLH	1/2/2020 20:33	300	16	7	25	27	31.05	280
DLH	1/2/2020 20:55	290	15	6	24	27	31.05	280
DLH	1/5/2020 18:30	310	23	7	38	38	43.7	310
DLH	1/5/2020 18:55	310	19	7	42	43	49.45	310
DLH	1/5/2020 19:55	310	22	4	36	43	49.45	320
DLH	1/5/2020 20:55	290	23	7	32	37	42.55	300
DLH	1/5/2020 21:55	310	18	7	32	42	48.3	300
DLH	1/5/2020 22:55	300	24	7	43	43	49.45	300
DLH	1/5/2020 23:55	300	16	10	28	40	46	300
DLH	1/6/2020 0:41	300	14	10	25	26	29.9	290
DLH	1/6/2020 1:55	290	20	10	30	30	34.5	300
DLH	1/7/2020 5:55	290	16	6	27	27	31.05	300
DLH	1/7/2020 14:55	290	23	10	32	32	36.8	300
DLH	1/7/2020 15:55	310	22	10	30	37	42.55	280
DLH	1/7/2020 16:55	290	17	10	24	32	36.8	300
DLH	1/7/2020 17:55	280	16	10	25	29	33.35	290
DLH	1/7/2020 18:55	290	15	10	23	27	31.05	270
DLH	1/7/2020 19:55	300	18	10	25	27	31.05	290



MCREM Weather Data Analysis



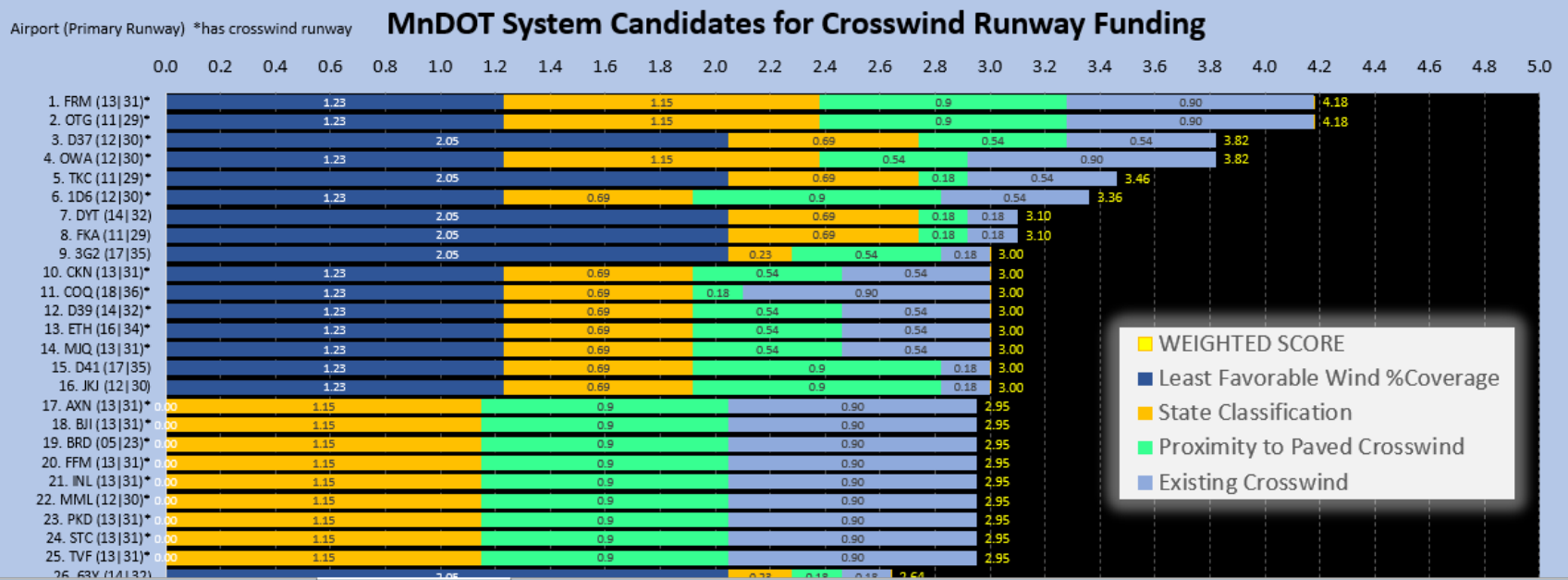
RDC	Allowable Crosswind Component
A-I and B-I *	10.5 knots
A-II and B-II	13 knots
A-III, B-III, C-I through D-III	16 knots
A-IV and B-IV, C-IV through C-VI, D-IV through D-VI	20 knots
E-I through E-VI	20 knots

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

MCREM



updated: 07/07/2021	CRITERIA	WEIGHT(%)	LOW (1)	MED (3)	HIGH (5)	Criteria Ratings Scale per each Airport LOW 1 <i>less likely for funding</i> MED 3 <i>somewhat likely for funding</i> HIGH 5 <i>most likely for funding</i>
	Existing Crosswind Runway	< █ > 18	None	Turf	Paved	
	Least Favorable Wind %Coverage	< █ > 41	95	(90-95)	90	
	State Classification	< █ > 23	Landing Strip	Intermediate	Key	
	Proximity to Paved Crosswind	< █ > 18	<30 nmi	30-50 nmi	>50 nmi	
		TOTAL: 100%	NOTE: Least Favorable Wind coverage >= 95% has a score of "0"			

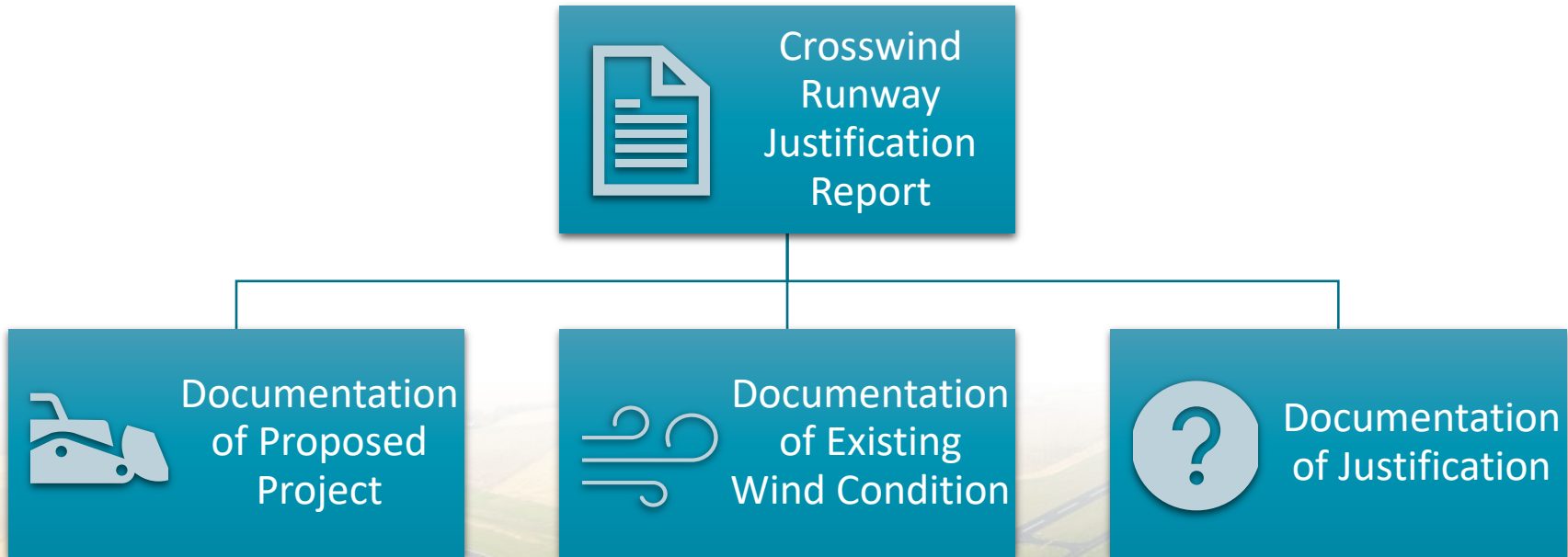


MCREM Criteria



CRITERIA (PERCENT WEIGHTING)	SCORING METHODOLOGY*	RELEVANCY
Least Favorable Percent Wind Coverage (41%)	High < 90% Med = 90 to 95% Low > 95%	Prioritizes state funding to airports with poor wind coverage. Wind coverage was evaluated by airport for the winter and summer seasons. Scoring was based on the season with the least percent wind coverage to increase the airport's period of operability.
State Classification (23%)	High = Key Med = Intermediate Low = Landing Strip	Prioritizes state funding to airports generally capable of supporting a wider range of aircraft. These airports typically also offer more services such as fuel and maintenance to support aircraft and the pilots/passengers they serve.
Presence of an Existing Crosswind (18%)	High = Paved Med = Turf Low = None	Prioritizes state funding to airports that currently have a crosswind runway, as maintaining an existing facility is nearly always more cost effective than new construction. Paved runways are also prioritized, as these facilitates support a broader range of aircraft, such as those used for corporate/business and safety- and security-related aviation activities.
Proximity to a Paved Crosswind (18%)	High > 50 nm Med = 30 – 50 nm Low < 30 nm	Prioritizes state funding to airports that may fill a gap in the statewide aviation system. This provides for air access and mobility across Minnesota while minimizing the duplication of facilities.

Crosswind Runway Justification Report



State Aviation System Plan



MINNESOTA **GO**

Clear Zones

Land Use Compatibility

- Protects the safety of aircraft and airport operations
- Safeguards the safety, health, and quality of life of populations living in the vicinity of airports



Height
Obstructions



Noise



Wildlife
Attractants



Visual
Obstructions



Congregations
of People

MnDOT Focus Areas of Land Use Compatibility



Height Obstructions

Natural and manmade height obstructions in the vicinity of an airport can pose a serious risk towards low-altitude aircraft operations on departure or arrival



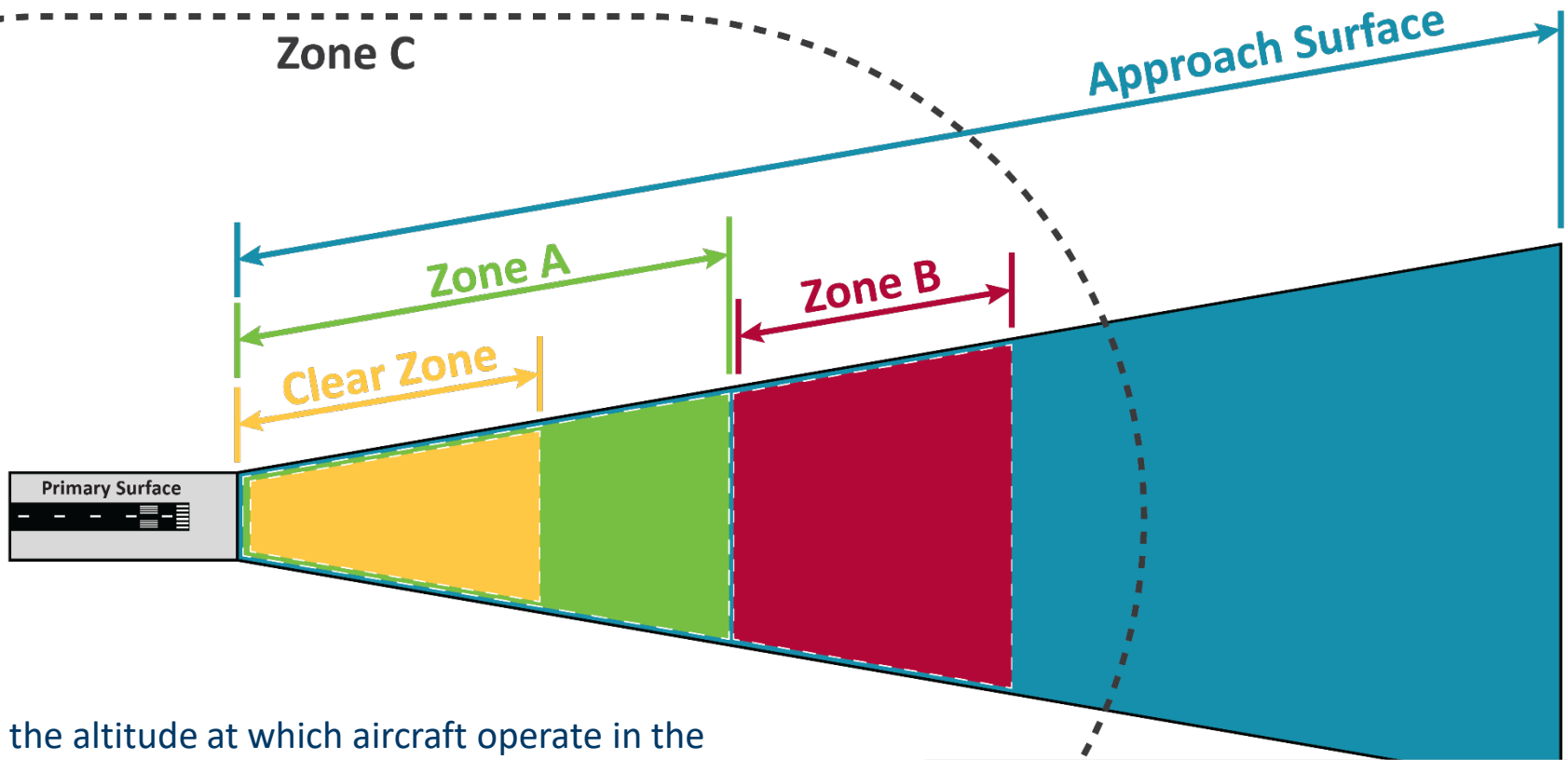
Congregations of People

Congested public areas surrounding an airport can increase the impact of aircraft accidents should they occur



Minnesota's airport zoning requirements and associated clear zone rules address fundamental components of airport land use compatibility by supporting the prevention of congregations of people and height obstructions in the land immediately off all runway ends.

Airport Protection



Due to the altitude at which aircraft operate in the airspace off each runway end, several layers of land use protections have been established for Minnesota airports. These protections are designed to enhance safety for people and property in the sky and on the ground.

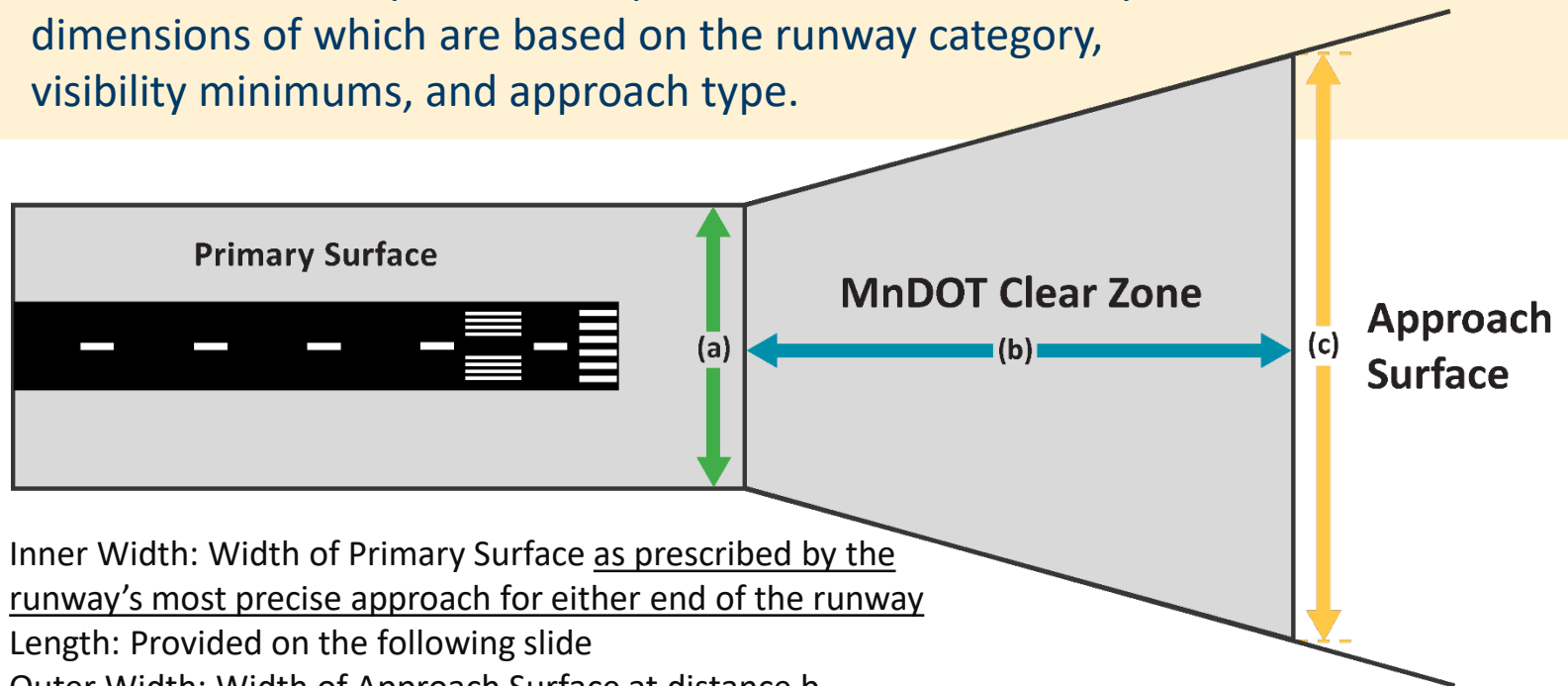
*Notes: Diagram is not to scale and is provided for example purposes only. The dimensions of each safety zone are defined in terms of runway category and approach type. See the **MnDOT Clear Zone Guidance** for full details regarding dimensions and compliance.*

Clear Zone Depiction



Key Takeaway

Clear zones are trapezoidal-shaped areas off each runway end, the dimensions of which are based on the runway category, visibility minimums, and approach type.



- a) Inner Width: Width of Primary Surface as prescribed by the runway's most precise approach for either end of the runway
- b) Length: Provided on the following slide
- c) Outer Width: Width of Approach Surface at distance b

Clear zones begin at the end of the Primary Surface. The Primary Surface extends 200 feet beyond each runway end for paved surfaces (shown in the example diagram). The primary surface ends at the runway end for turf surfaces.

Clear Zone Dimensions



APPROACH TYPE (RUNWAY CATEGORY) – VISIBILITY MINIMUM, AS APPLICABLE	LENGTH OF SURFACE (FT)
Turf	1,000
A(V)	1,000
B(V)	1,000
NP(A)	1,000
NP(C) – Visibility minimums greater than ¾ mile	1,700
*NP(D1) – Greater than or equal to ¾ - mile visibility	1,700
*NP(D2) – ½ - mile visibility	2,500
PIR	2,500

The length beyond runway end and inner width of the clear zone are dependent on the Primary Surface.

The width of the Primary Surface is prescribed by the runway's most precise approach for either end of the runway. Accordingly, the inner width of the clear zone may be determined by the approach for the other end of the runway

***Note:** Clear zone dimensions differ from those established by FAR Part 77 for airports with a non-precision instrument approach (NP) by providing separate dimensions for runway ends with visibility minimums greater than ¾ mile (referred to as D1) and visibility minimums of ½ mile (referred to as D2). FAR Part 77 only provides one dimensional standard for NP(D) for visibility minimums as low as ¾ mile. Definitions: A = Utility runways. B = Runways larger than utility. C = Visibility minimums greater than ¾ mile. D1 = Visibility minimums greater or equal to ¾ mile. D2 = Visibility minimums of ½ mile. V = Visual approach. NP = Non-precision instrument approach. PIR = Precision instrument approach. Sources: MnDOT Aeronautics, 2022; FAR Part 77

Clear Zone Guidance Compliance Process

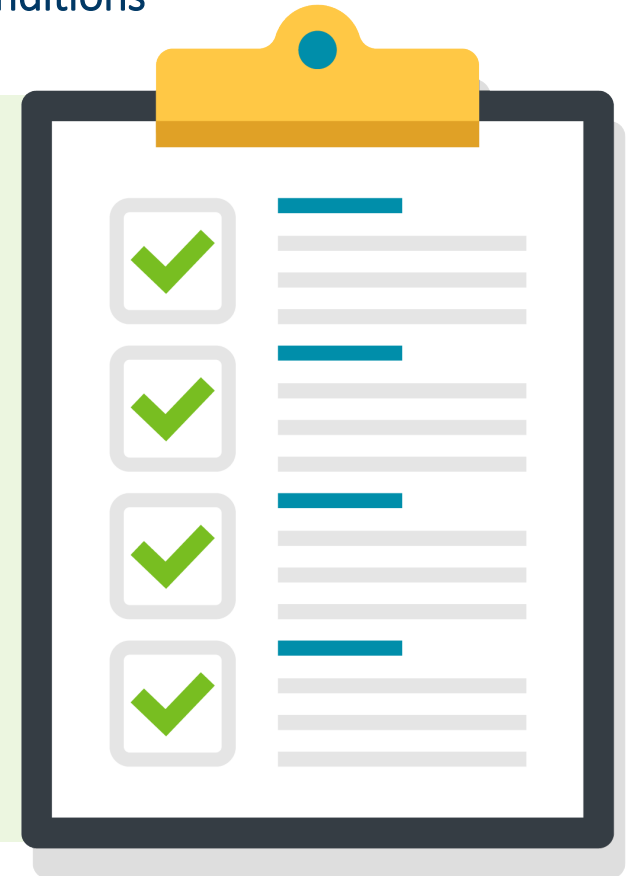


Clear Zone Acquisition Plan (CZAP)

Required in all cases when the airport sponsor does not currently own 100 percent of clear zones off all runway ends based on ultimate build-out conditions

Primary purposes:

- ✓ Documents the proposed clear zone property interest to be acquired in fee
- ✓ Provides justification regarding why some or all clear zones cannot be acquired in fee
- ✓ Identifies existing or proposed alternative land use control mechanisms enacted or pursued to enhance safety and reduce nuisances associated with aircraft operations



CZAP Components

SECTION 1: Airport Map

- Clear zone dimensions as established by this guidance
- Existing land ownership and airport property boundaries
- Property interests that are and are not proposed for future fee simple ownership
- Features that may affect land use compatibility within the clear zones

SECTION 2: Narrative Report

- Clear explanation of each factor contributing to the exception request
- Existing and proposed alternative land use control strategies to support airport land use compatibility within clear zones

SECTION 3: Property Ownership Table

- Detailed information about all parcels located within the airport's clear zones
- Specific information to be provided includes but is not limited to owner, estimated market value, existing land uses, and the height of all buildings within the clear zones (as applicable)

SECTION 4: Attachments (as available)

- Applicable airport zoning regulations
- Comprehensive annual financial report for the airport sponsor
- Legal documentation of alternative land use control strategies currently in-place

Future Tasks



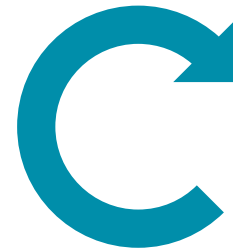
External Stakeholder Meetings on
Policy Implementation



MnDOT Aeronautics CIP/Grant
Management System



NAVAIDs Modernization
Program



Update MnSASP Hub

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Thank You!