Range Regional Airport Master Plan
Executive Summary

May 2023

RANGE REGIONAL AIRPORT

RS&H

INTRODUCTION

Range Regional Airport (HIB) is located in northern Minnesota within St. Louis County and the city of Hibbing. HIB is one of nine airports in Minnesota served by airlines and is a critical facility within the state aviation system, providing access into the Mesabi Iron Range region. The airport is classified within the Minnesota State Aviation System Plan (SASP) as a key commercial service airport, having a paved and lighted runway longer than 4,900 feet and serving scheduled air service. HIB is governed by the Chisholm-Hibbing Airport Authority (CHAA).

Range Regional Airport Location Map

Scan the QR code with your device to visit the Range Regional Airport Master Plan website for full study documentation and an interactive master plan experience.

Early in the master planning process, stakeholders identified several focus areas to be explored when planning for the airport's future development needs. These key planning elements are listed below and depicted in the Study Focus Areas map.

» **Terminal and landside expansion** - Evaluate future expansion needs and opportunities for the terminal area

» **Terminal functional area program** - Identify necessary terminal improvements, project triggering events, and phasing over the planning period and beyond

» **Highest and best land use** - Optimize airport service and revenue through strategic development of aeronautical and non-aeronautical land

» **General aviation operations and aircraft storage** - Establish a plan for high quality, safe, and operationally efficient general aviation facility development

» **Fixed base operator (FBO) location and management** - Review alternatives with consideration to management/staffing impacts for development of a modern FBO

» **Primary runway extension** - Evaluate purpose and need for extension of Runway 13-31

» **Airfield design standards** - Assess airfield geometry deficiencies and operational efficiency, especially during winter weather operations

» **Navigational aids and ownership models** - Determine navigational aid requirements as well as the appropriate ownership model for equipment operations and maintenance

» **Future eastside development** - Create a cohesive plan for future development of land on the airport's eastside

» **Airport support facilities** - Define future needs for performance of airport maintenance, administation, and storage of snow removal equipment

» **Airfield Runway Safety Area (RSA)** - Craft plan to address RSA and airfield drainage issues

» **Environmental NEPA process** - Plan for environmental process by understanding development impacts on federrally designated resource categories

» **Landside and regional access** - Study landside vehicular access/circulation impacts

» **Airport zoning** - Prepare CHAA for undertaking the Minnesota Airport Zoning process

» **Airspace obstruction removal** - Establish mitigation plans for airspace obstructions

STUDY FOCUS AREAS

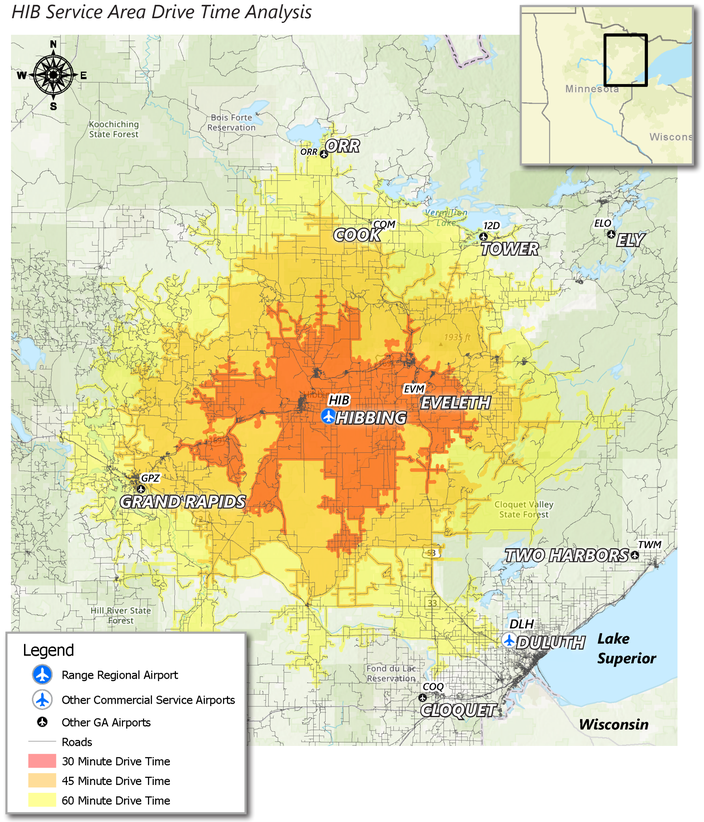
The Range Regional Airport Master Plan...

- ☑ Provides guidance for future development
- ☑ Accommodates future aviation demand
- ☑ Establishes financially feasible project implementation
- ☑ Identifies and responds to environmental and socioeconomic conditions

DEMAND FORECAST

Aviation demand forecasts were developed for commercial passenger enplanements, operations, and based aircraft at HIB. Forecasting took place between 2020 and 2021, through which the COVID-19 pandemic inflicted global economic distress and dramatically disrupted the aviation industry, especially commercial passenger travel. Nationally, general aviation activity was far less disrupted than commercial passenger activity, and in many instances flourished. Commercial passenger activity, however, was drastically impacted, varying in severity by routes and passenger types. These factors were considered while developing the HIB forecast.

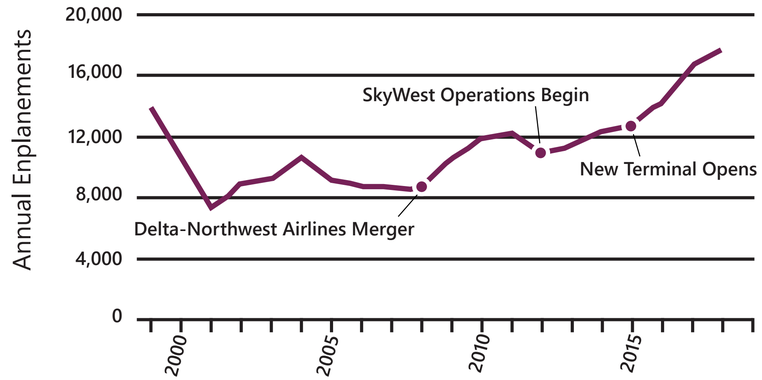
HIB Service Area Drive Time Analysis



Demographic and socioeconomic conditions of the Range Regional Airport service area are often indicators used to forecast airport demand. Due to the predominantly rural nature of northern Minnesota, the service area for HIB extends beyond the typical 60-minute drive time and includes the Grand Rapids area and communities as far north as Orr.

Scheduled passenger service is provided by SkyWest Airlines using Bombardier CRJ-200s (50-seats) with flights to/from Minneapolis International Airport (MSP). Since its introduction in 2012, enplanements have grown steadily due to increasing load factors, which grew from 35.7 percent to 55.6 percent between 2012 and 2019. However, the CRJ-200 is no longer being manufactured and the SkyWest CRJ-200 fleet age averages 17 years old. The question of what aircraft replaces the CRJ-200 as they retire has yet to be definitively answered. Conversations with SkyWest representatives indicated that the most likely candidate for service to HIB is the Embraer E-175 aircraft (76 seats), which was determined to be the future critical design aircraft at HIB.

Historical Enplanements



A based aircraft inventory was performed in October 2020 and used as the baseline for this forecast. It is estimated that the general aviation industry, as a whole, will continue to track based on prior trends.

Three general factors were used to support this estimate, including:

- » Continued increase of high-net worth individuals with means to own private aircraft.
- » Increased usage of general aviation for businesses and individuals leery of airline transport during and after the COVID-19 global pandemic.
- » In 2020, many light sport aircraft manufacturers outperformed 2019 sales metrics proving continued demand for small piston aircraft.

Based Aircraft Forecast

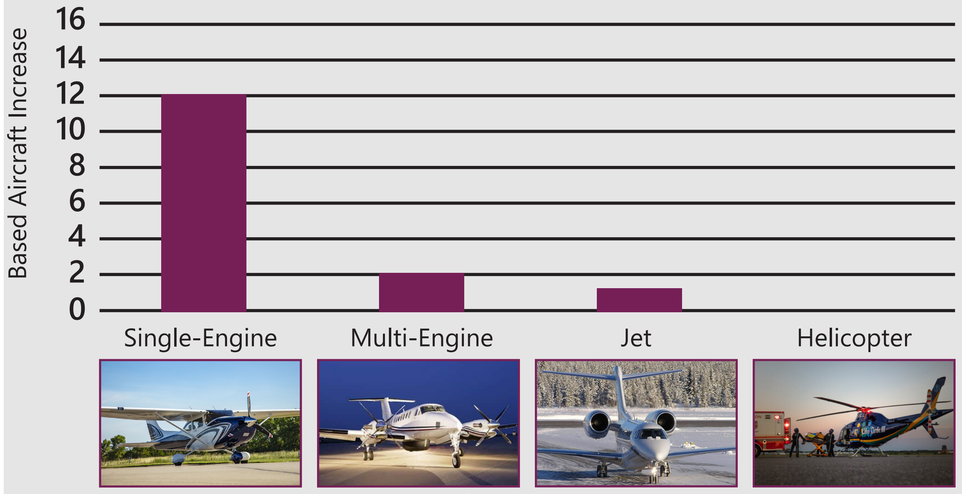
Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
2020	37	0	0	1	0	38
2025	44	1	0	1	0	46
2030	46	2	0	1	0	49
2035	49	2	1	1	0	53
2040	51	2	1	1	0	55
CAGR 2005-2025	*1.6%*	*4.7%*	-	*0.0%*	*0.0%*	*1.9%*

Commercial passenger operations were held flat though the planning period, in correlation with the baseline enplanement forecast. FAA data for other air-taxi and commuter operations provided in the baseline scenario were also kept static though the planning period. The increase of total annual operations in this forecast is directly correlated to the forecasted increase of based aircraft.

Facility requirements analysis also considered the potential for the introduction of ultra low cost carrier (ULCC) operations. The forecasted level of service analyzed is up to two destinations served by two flights per week by Boeing 737 and/or Airbus A319/320 aircraft.

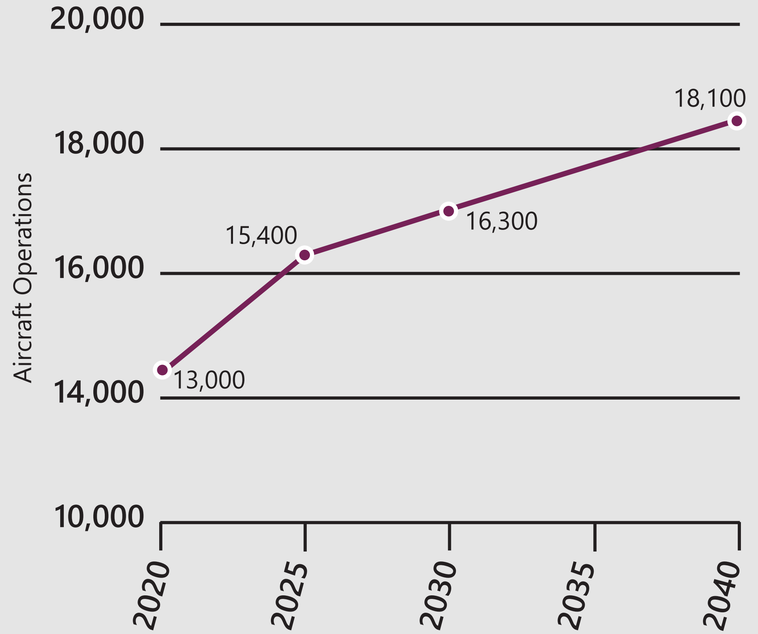
DEMAND FORECAST

Based Aircraft Forecast



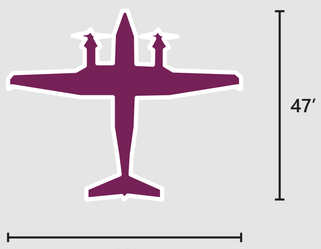
Aircraft Operations

Operations	Base Year Level (2020)	Base Year +5 years (2025)	Base Year + 10 years (2030)	Base Year + 20 years (2040)
Itinerant				
Air Carrier	34	34	34	34
Commuter/Air Taxi	1,466	1,466	1,466	1,466
General Aviation	7,980	9,660	10,290	11,550
Military	100	100	100	100
Local				
General Aviation	3,420	4,140	4,410	4,950
Total Operations	**13,000**	**15,400**	**16,300**	**18,100**

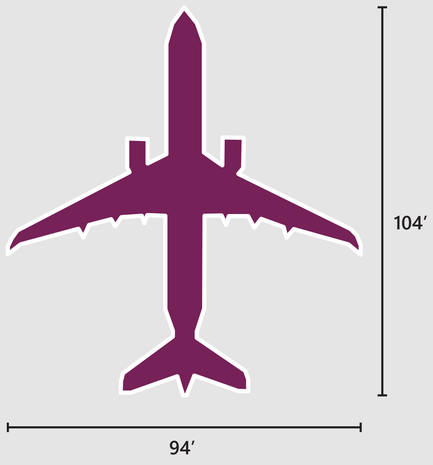


Future Critical Aircraft

Beechcraft King Air 350
(B-II)

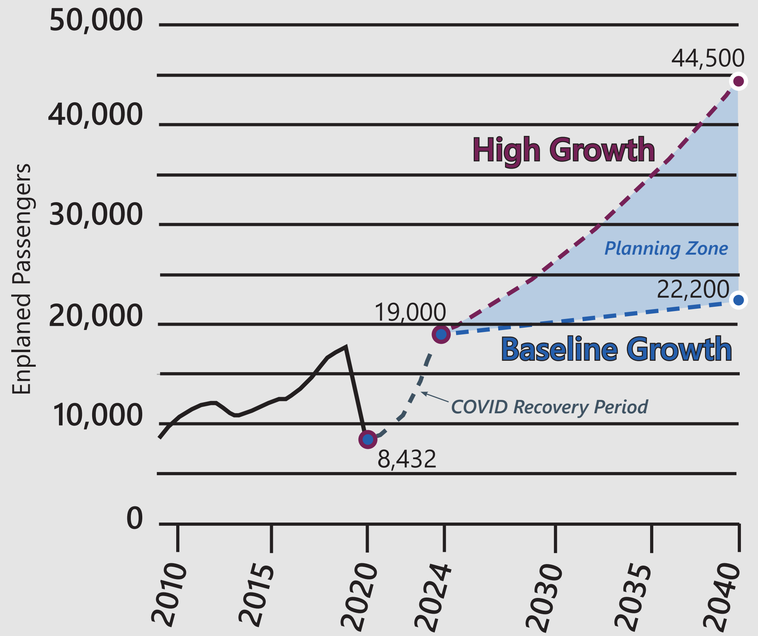


Embraer E-175EWT
(C-III)



Enplaned Passengers

Year	Historical	Baseline Growth Scenario	High Growth Scenario
2010	10,604		
2015	12,271		
2020	8,432	8,432	8,432
2025		19,143	19,992
2030		20,119	26,104
2035		21,145	34,085
2040		22,224	44,506



FACILITY REQUIREMENTS

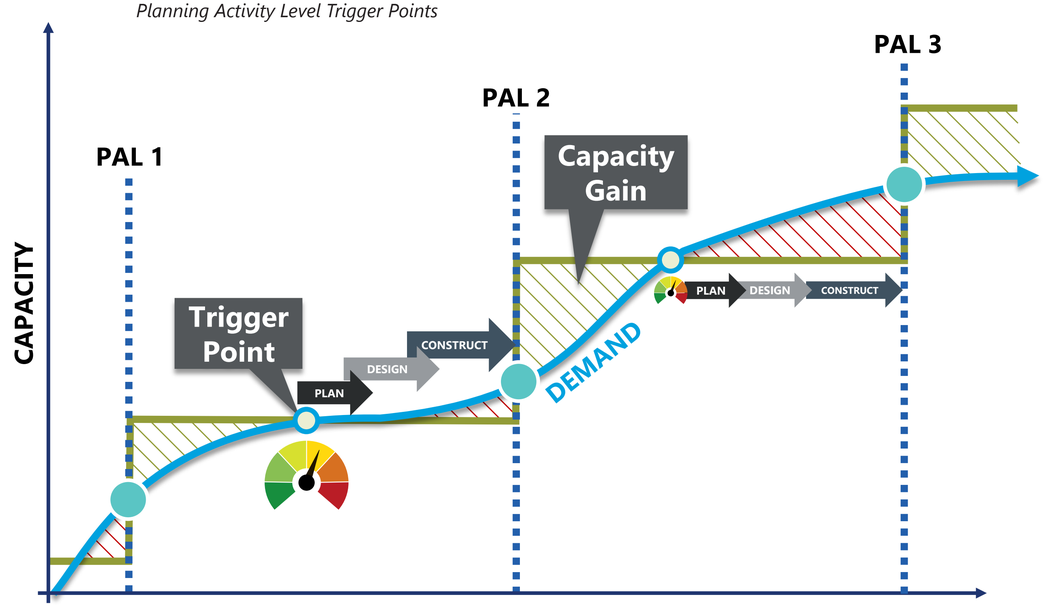
Future airport facility requirements, including the type, size, and quantity, are dependent on future aviation activity levels projected in the aviation demand forecasts. The need for new or expanded facilities is often driven by capacity shortfalls that leave an airport unable to accommodate forecasted growth or desired levels of service using existing facilities. However, the requirements for new or improved facilities can also be driven by other circumstances, such as, updated standards which have been adopted by the FAA or another regulatory agency, an evolving strategic vision for the airport, the replacement of outdated or inefficient facilities that are prohibitively costly to maintain or modernize, or the desire to introduce new services and facilities.

The HIB facility requirements analysis uses the forecast aircraft operation demand levels to define planning activity levels (PALs) which trigger the need for investment to accomodate that user demand in a way which maintains acceptable levels of service. The airfield is the leading facility as the design is highly dictated by terrain, predominant wind patterns, and the aircraft fleet mix. This is followed by the tenant services, airport support facilities, and landside infrastructure.

The image to the right is a high-level representation of how Range Regional Airport can plan to effectively meet PAL demand levels by strategically increasing capacity over time as demand materializes.

One key facility issue studied as part of the master plan was known deficiencies with the Runway Safety Area for Runway 13-31. The image below shows ground areas above the minimum allowable grade (red) and those below maximum grade (blue) to be addressed in a near-term FAA Airport Improvement Program (AIP) funded project.

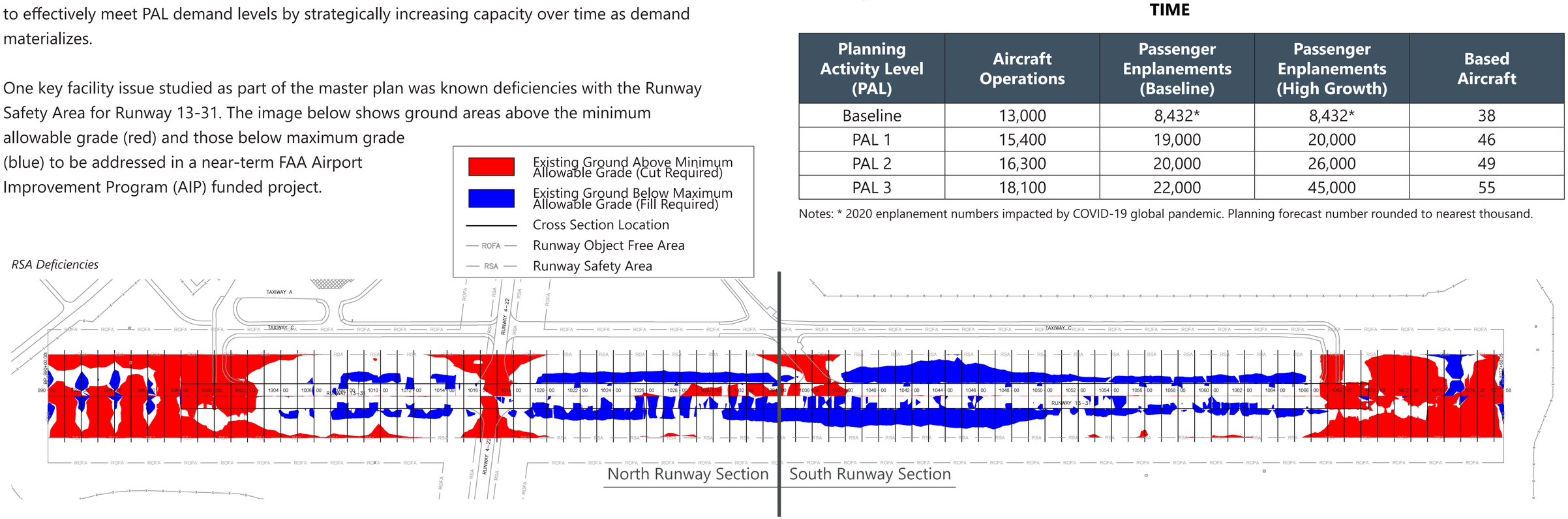
Planning Activity Level Trigger Points



Planning Activity Level (PAL)	Aircraft Operations	Passenger Enplanements (Baseline)	Passenger Enplanements (High Growth)	Based Aircraft
Baseline	13,000	8,432*	8,432*	38
PAL 1	15,400	19,000	20,000	46
PAL 2	16,300	20,000	26,000	49
PAL 3	18,100	22,000	45,000	55

Notes: * 2020 enplanement numbers impacted by COVID-19 global pandemic. Planning forecast number rounded to nearest thousand.

RSA Deficiencies



FACILITY REQUIREMENTS

AIRFIELD RUNWAY REQUIREMENTS

Runway Length » Extend Runway 13-31 to 7,400'–8,400'
Runway Width » 20-foot shoulders Runway 13-31 *(recmnd)*
Pavement Strength
- » Increase PCN from 33/F/C/X/T to 50/F/C/X/T
- » Improve strength prior to B737-800 reaching 130 annual operations

Runway 13-31 Blast Pads » Plan for C-III (200'x200')
Runway 22 Blast Pad » Construct B-II (95'x150')
Runway Designation
- » Designate Runway 4-22 to Runway 5-23
- » Prevent Runway 22 OFZ intrusion with vehicle warning signage

AIRFIELD TAXIWAY REQUIREMENTS

Taxiway Design Standards
- » 20-foot paved shoulders for Taxiway A and B-1
- » Taxiways A, A-1, B, B-1, and C fillets

Taxiway Pavement –
- » Reconstruct Taxilane-1, the MnDNR Apron, and Taxiway A
- » Resolve non-standard airfield design:
  - (D) Direct access
  - (I) Intersection other than right angle
  - (G) Greater than 3 nodes
  - (C) Convergence of multiple taxiway types
  - (N) Nonsequential taxiway designation
  - (M) Middle third crossing *(potential future)*
  - (R) Runway used as a taxiway
  - (W) Wide expanse of pavement
  - (Y) Y-shaped taxiways crossing a runway

NAVIGATIONAL AID REQUIREMENTS

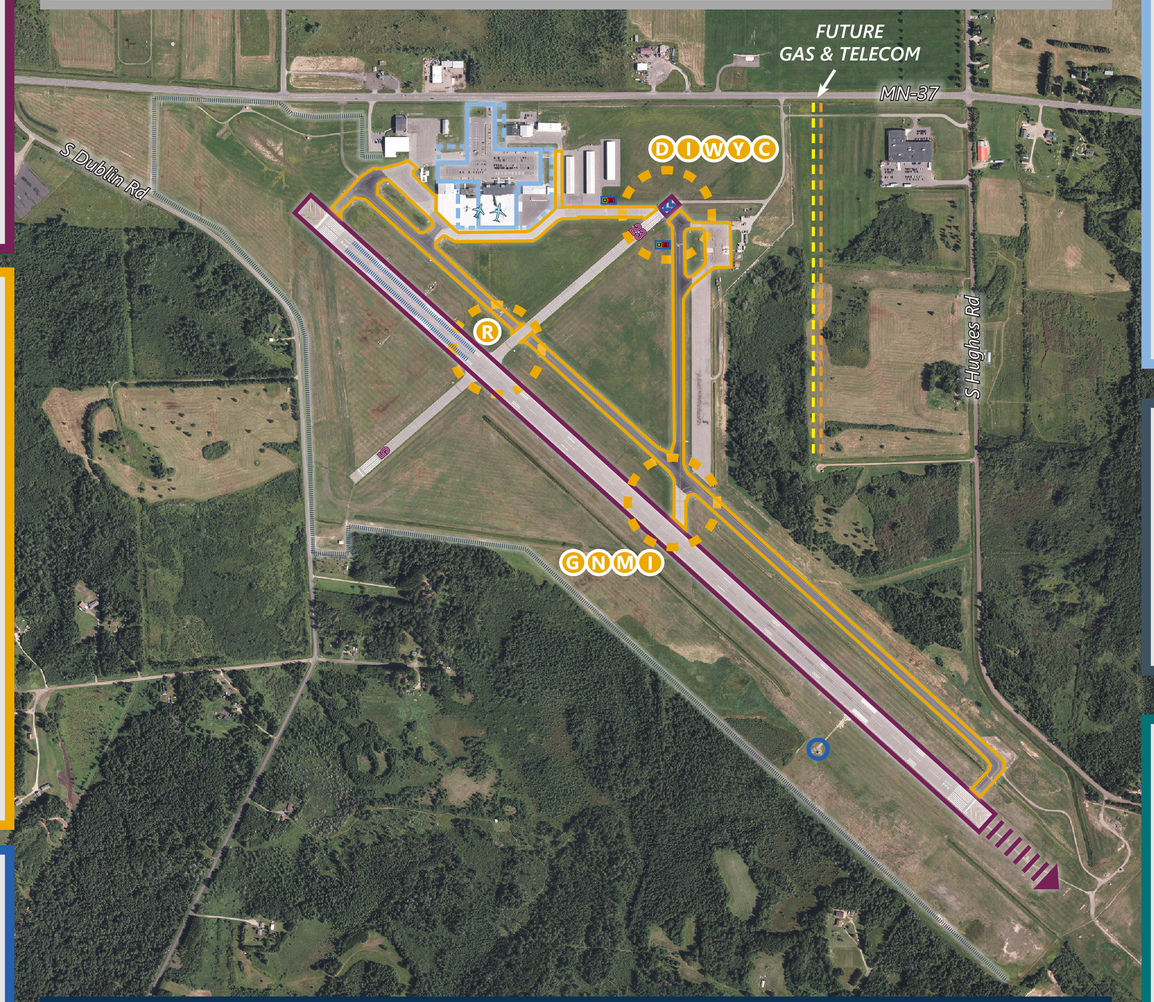
Pavement Markings
- » Threshold/runway remarking
- » Runway 22 Blast Pad chevrons

Lighting
- » Runway 31 touchdown zone
- » Runway 22/Taxiway B threshold lighting
- » Runway 22 Taxiway hold signs for Taxiways A and B

Vehicle Service Road » North & east areas of airfield
Segmented Circle » New recommended
ASOS » Backup generator

UTILITY REQUIREMENTS

Future East Gas and Telecom Extension » Connect Highway 37 lines in a similar path to existing water, sewer, and electrical lines
Airport Energy Sustainability » Solar feasibility study and identify potential sites for harvesting of renewable energy



AIRCRAFT PROPERTY REQUIREMENTS

Bury Fence » Bury wildlife fences to mitigate wildlife hazards on the airfield
Airport Zoning Study » Complete zoning study to meet MnDOT requirements
Land Acquisition
- » Consider future RPZ property needs within the immediate departure end of Runway 13
- » Strategic land purchases for future aeronautical and/or non-aeronautical development

TERMINAL/LANDSIDE REQUIREMENTS

Terminal Building Space
- » *Baseline scenario* – Concessions, restrooms, and administrative
- » *ULCC scenario* – Preserve and prepare

Air Carrier Apron » Increase air carrier apron space with up-gauging of EAS aircraft or increased frequency of Boeing 737-800
Wayfinding and Signage
- » Signage to airport
- » Comprehensive wayfinding

Rental Cars » Assess potential customer facility charge (CFC) for future facilities (terminal expansion)
Parking
- » Parking fee cost-benefit analysis
- » Electric vehicle charging stations
- » Align with terminal expansion

AIRCRAFT PARKING REQUIREMENTS

Based Aircraft Storage (hangars)
- » *T-Hangars* - 11 more required by PAL 3
- » *Conventional* - 3 more required by PAL 3
- » *Corporate* - 1 more required by PAL 3

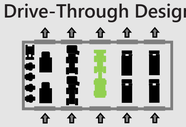
Transient Aircraft Storage (apron)
- » Transient apron requires addl 8,300 sq yds by PAL 3
- » Separation of commercial and GA activities

AIRCRAFT SUPPORT REQUIREMENTS

Airport Maintenance and Equipment Storage Facility
- » Explore different configurations of the Maintenance/ Storage facility to provide adequate space for safe maneuvering of larger equipment

Back-in Design

Drive-Through Design



Fixed-Based Operator
- » Modern facility separate from commercial terminal
- » More transient apron and heated hangar for winter
- » Perform cost-benefit analysis for self-service Avgas

Aircraft Wash Facility » Enclosed or open air 70'x70' facility accommodating up to Beechcraft King Air 350

DEVELOPMENT ALTERNATIVES

Establishing the HIB strategic development vision began with determining highest and best land uses as well as evaluating development constraints such as environmental conditions and airspace. Development alternatives were then explored to meet forecasted HIB demand. These alternatives were divided into four study categories: Airfield, Terminal Area, General Aviation, and Airport Support. From these alternatives, two comprehensive alternatives were established for further review. All alternative concepts were evaluated against a thorough list of criteria including assessments of safety and efficiency; level of service and user experience; ease and cost of implementation; management, staffing, and policy considerations; and environmental impacts.

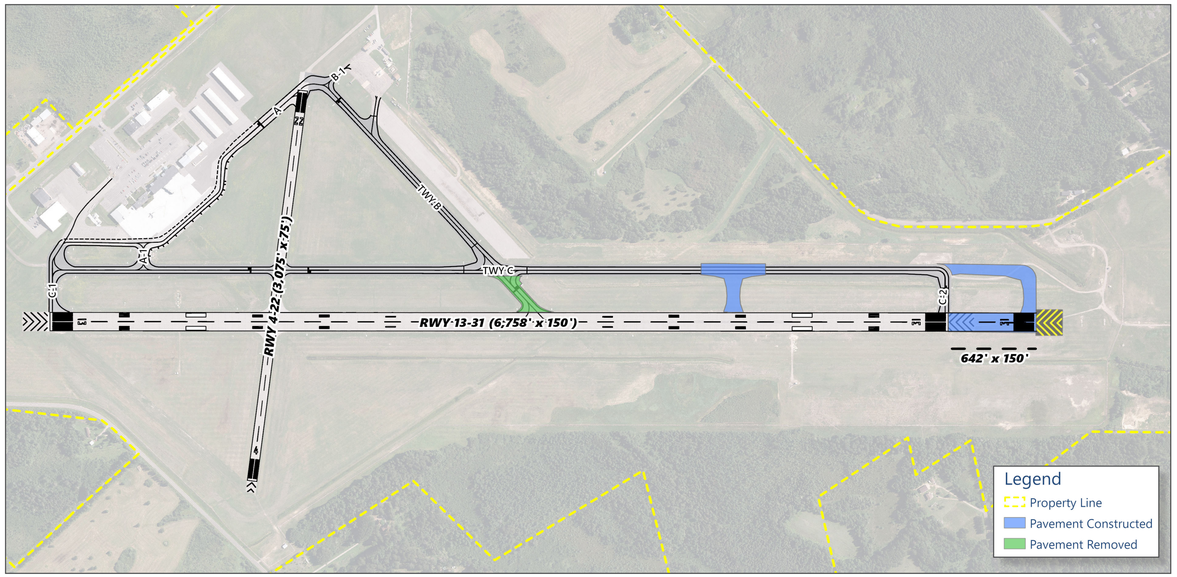
Airfield

Airfield alternatives focused on resolving existing non-standard conditions and the extension of Runway 13-31 to 7,400 feet. Extending the runway to the north was deemed infeasible due to the alignment of Mn-37, the location of Grandview Memorial Gardens, and potential airspace challenges. An extension of Runway 13-31 to the south is the preferred alternative.

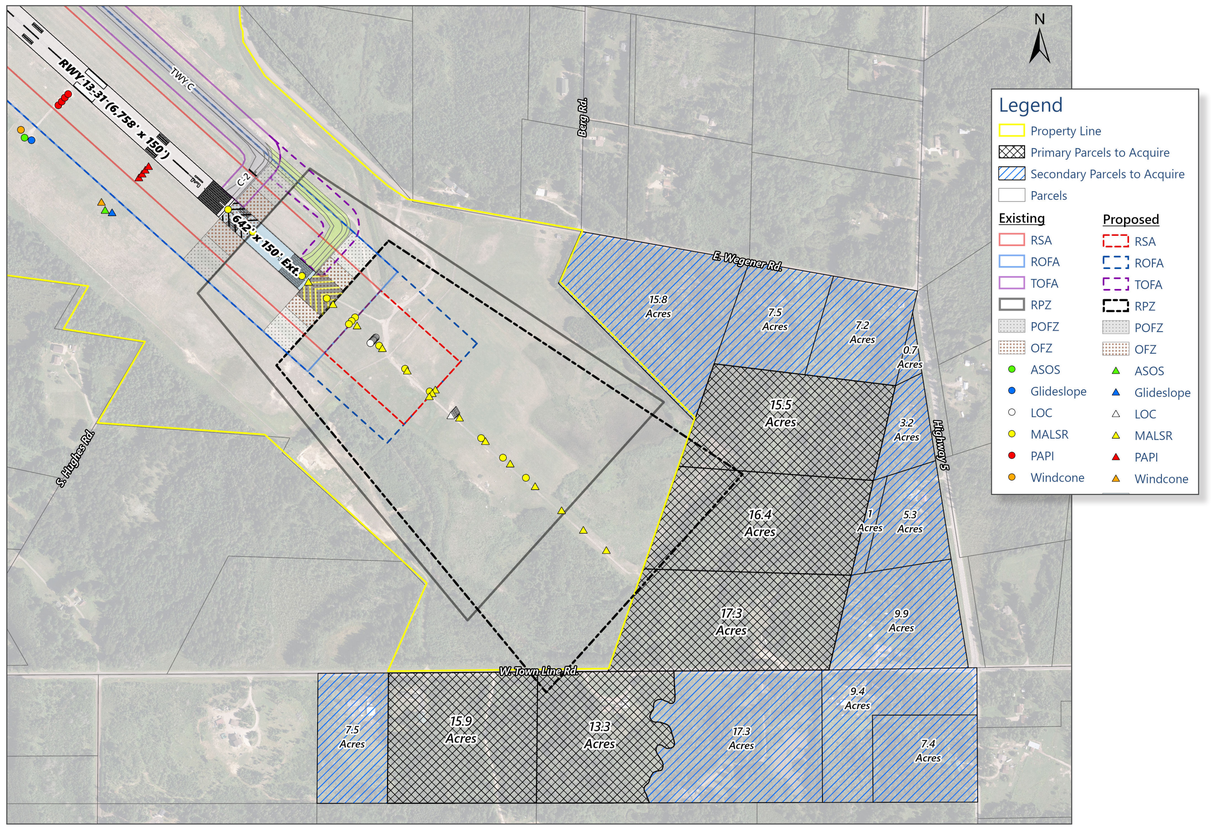
Extending Runway 13-31 south has a number of impacts that need to be addressed from the planning stage through design and implementation. NEPA requires that the Airport undergo an environmental assessment to understand the full environmental impacts of the development and ensure the public has an opportunity to review and comment on the evaluations. Additional requirements for an extension to 7,400 feet include the acquisition of land to control the future RPZ, environmental permitting and wetland mitigation, improvements to the future RSA, and the movement/replacement of existing navigational aids. Correcting the design of the Taxiway B connector will achieve current FAA design standards and locating it outside the middle third of the runway is recommended. To avoid wasted effort, this connector will be planned for in a location compatible with the determined preferred runway length. Additionally, Taxiway C would be extended to reach the new threshold of Runway 31.

The runway extension has a small degree of impact to Town Line Road. The existing right-of-way runs just within the far south corner of a 7,400-foot runway extension's new RPZ. An additional study may need to be performed to determine if safe conditions could be maintained within that portion of the RPZ or if Town Line Road would need to be altered to mitigate the new RPZ impacts.

7,400' South Runway Extension



7,400' South Runway Extension



DEVELOPMENT ALTERNATIVES

Terminal

Terminal planning was an important element of the study and three growth scenarios were considered: Baseline, High Growth, and a specialized assessement looking at what the impacts would be if a scheduled Ultra Low-Cost Carrier (ULCC) began service using large aircraft such as the Boeing 737-800 (which currently operates at HIB for charter flights by Sun Country Airline).

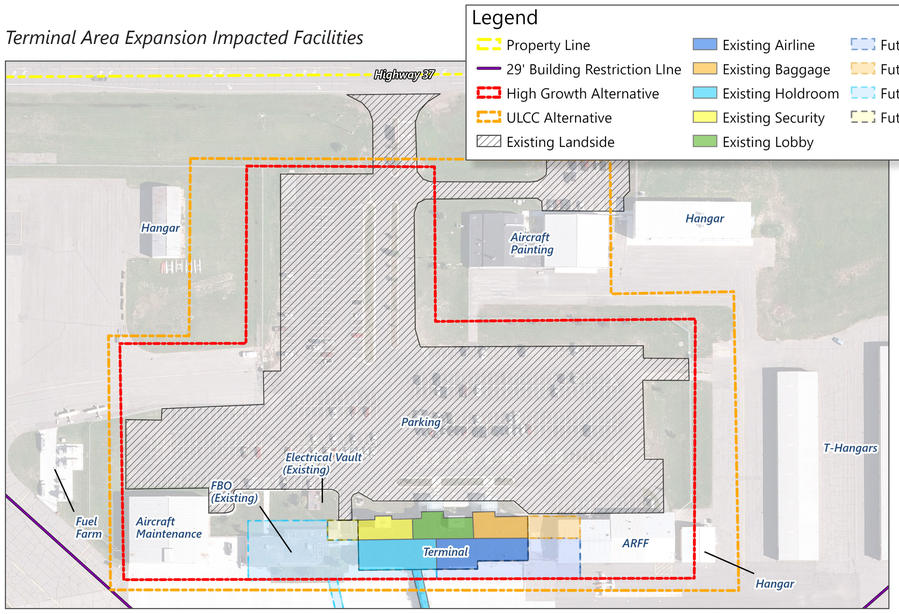
The Baseline growth scenario shows the need for small terminal expansions to accommodate additional concession, restrooms, and administrative space. The High Growth scenario, in addition to Baseline growth needs, increases passenger demands requiring expansion of the security screening area, introduces a new gate and boarding bridge, and expands holdroom space. The ULCC scenario requires a terminal roughly double the size of the existing terminal, with expansion of all terminal functional areas excluding mechanical, electrical, and telecom, which was originally slightly overbuilt in anticipation of future expansion projects. For the purposes of planning for this 20-year period and beyond, needs for the ULCC scenario and impacts on adjacent facilities will be considered as the proper amount of space to plan for future expansion.

The historical development pattern within the terminal area has resulted in mixed commercial and general aviation operations. The preferred development plan creates a path forward to incrementally develop general aviation facilities on the east side of the airfield to allow for replacement and ultimately the removal of existing general aviation facilities within the terminal area. The existing terminal is designed to accomodate future expansion in a linear fashion by expanding the building on the east and west sides. Landside facilities would need to grow accordingly and development of a loop road for circulation and formal parking program is possible but constrained within the existing footprint. Existing general aviation facilities do restrict at-grade expansion of landside facilities under the ULCC growth scenario.

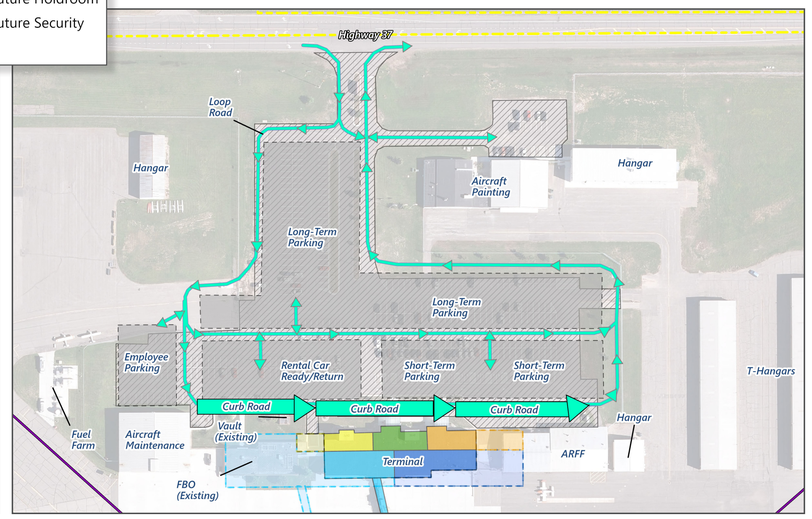
Terminal Area Functional Space Requirements

Commercial Passenger Planning Metrics	Existing	Baseline	High Growth	ULCC
		PAL 3	PAL 3	PAL 3
Total Peak Hour Enplaned	45	50	70	160
Total Peak Hour Deplaned	45	50	70	160
Peak Hour Operations	1	1	1	1
Terminal Area	**Required Space (sf)**			
Airline (Ticketing, Bags, Gates/Holdroom)	6,700	5,360	7,000	17,660
TSA (Screening and Offices)	2,190	3,700	4,000	5,900
Concessions (Sterile and Non-secure)	670	600	900	2,060
Public Space (Circulation, Restrooms, Lobbies)	8,300	4,380	7,640	13,390
Airport Administrative Storage, and Misc.	420	600	1,100	1,600
Utilities (Mechanical, Electrical, Telecom)	2,670	1,610	1,350	1,760
Total Terminal Area	**20,950**	**16,250**	**21,990**	**42,370**
Total Terminal Area Surplus (Deficit)	**-**	**4,700**	**(1,040)**	**(21,420)**

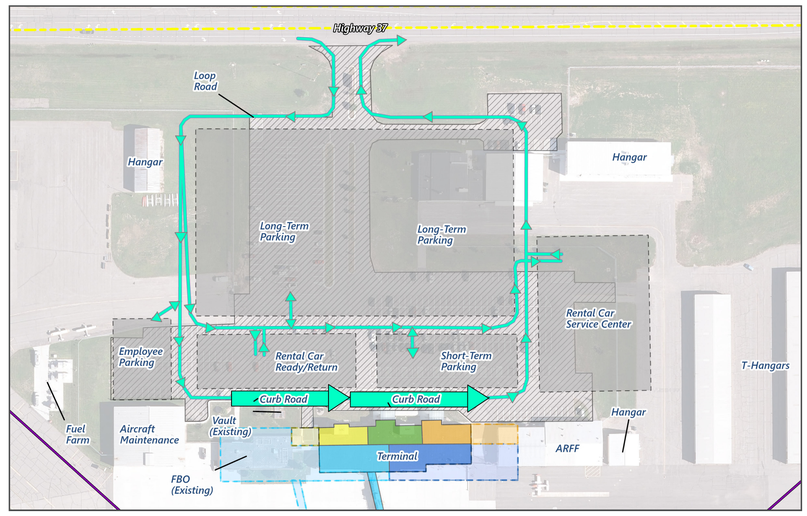
Terminal Area Expansion Impacted Facilities



Landside High Growth Program Alternative



Landside ULCC Growth Program Alternative



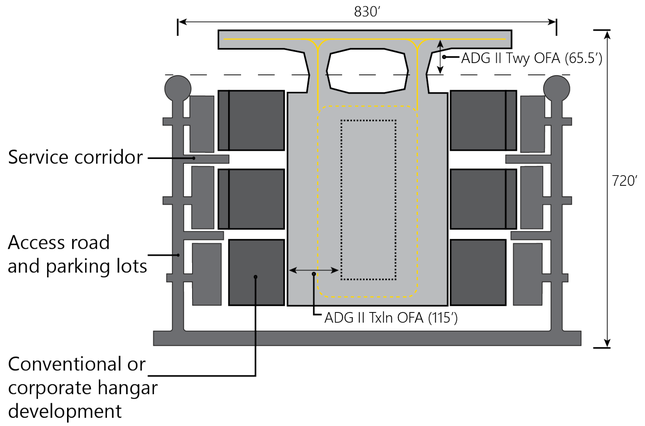
DEVELOPMENT ALTERNATIVES

General Aviation and Airport Support

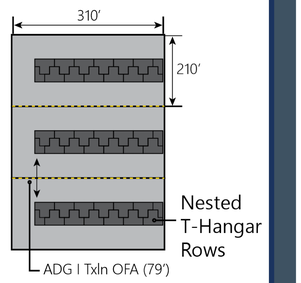
Two multi-phased high-level alternative development strategies were created for the east side of the airfield. This region of the airport was selected because it provides the best location for aeronautical development, with plentiful acreage of Airport-owned land and electrical, water, and sanitary utility lines already on site. Both east side general aviation development alternatives rely on the construction of a new FBO facility and fuel farm as an essential anchoring component to future development in this area.

General aviation facilities alternative one aligns to the existing orientation of Taxiway B and develops facilities to the east on an as-needed basis. Alternative two strategically adds development aligned with the two runways without conflicting with Taxiway B until after it is removed, making the ultimate layout align with the orientation of Taxiway C and both runways.

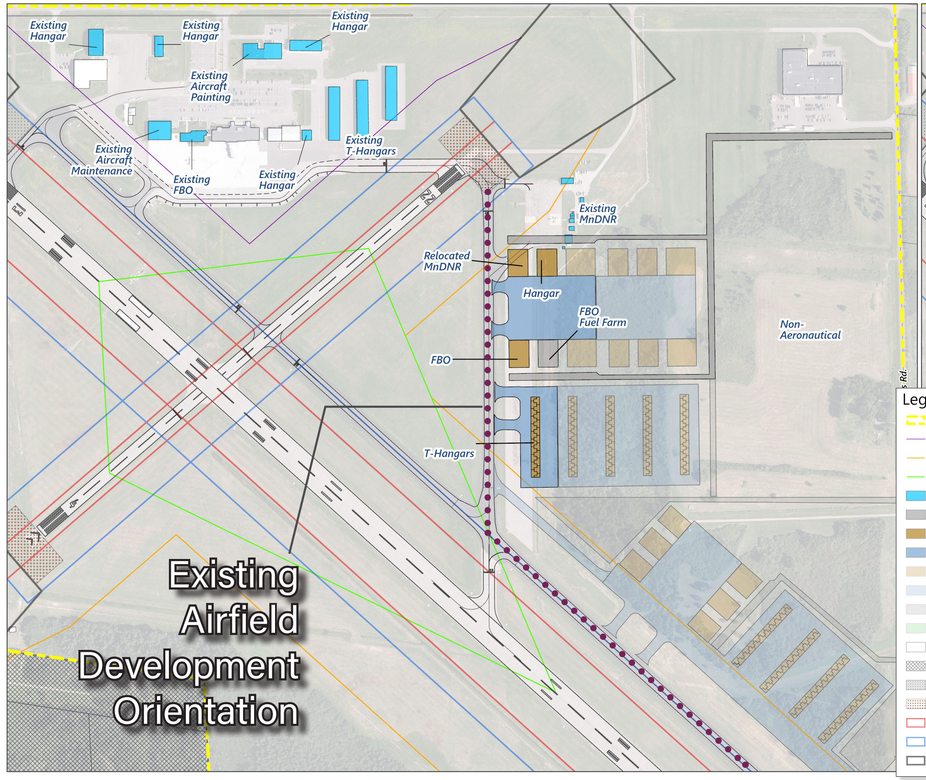
Corporate/Conventional Hangar Layout
~600,000 square feet



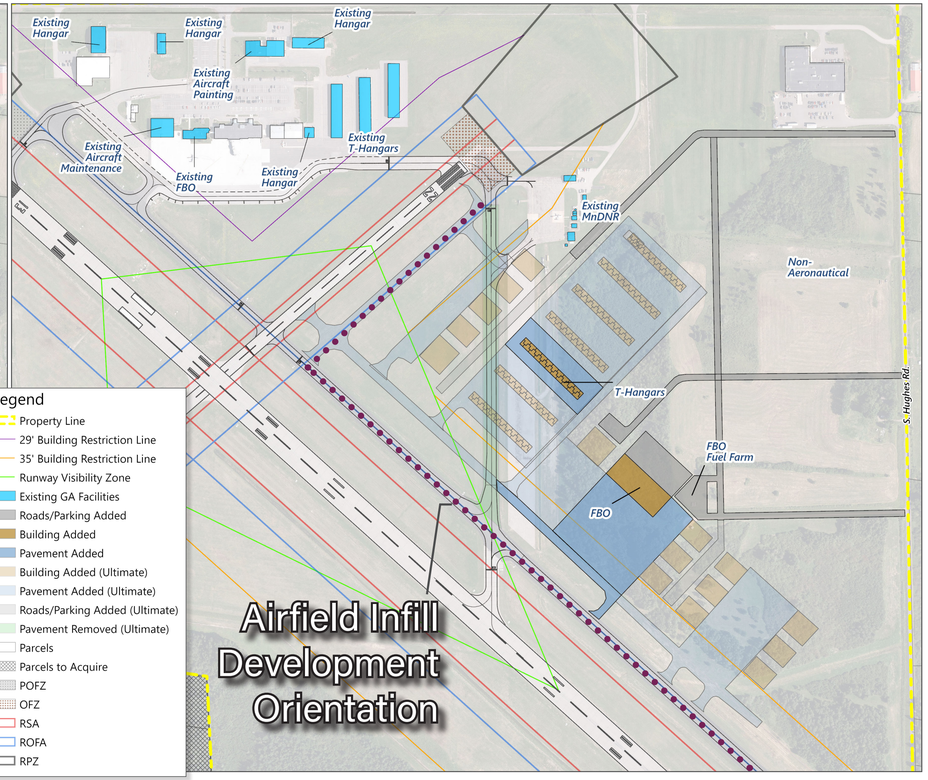
Nested T-Hangar Row
~65,000 square feet



General Aviation Facilities - Eastside Development Alternative 1



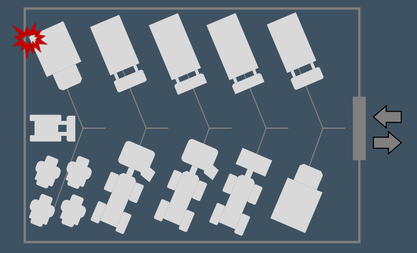
General Aviation Facilities - Eastside Development Alternative 2



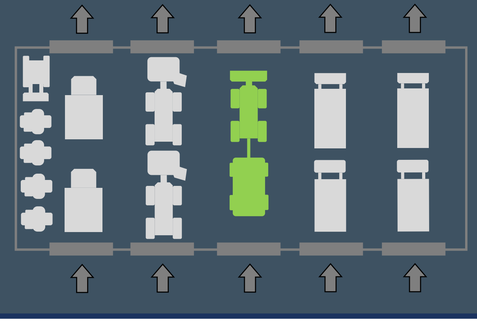
Equipment Storage

The Airport's field maintenance/SRE facility spatial requirements are also adequate; however, the layout of the facility is not optimal for safely and efficiently moving equipment, resulting in Airport staff having to make compromises when organizing equipment for long-term storage and maintenance. Equipment must often be moved on a temporary basis to shift and maneuver around non-seasonal equipment. The existing "back-in style" design is less operationally efficient and poses greater risks to staff safety and equipment integrity than a "drive-through style" design.

Back-in Design



Drive-through Design



STRATEGIC AIRPORT VISION

The strategic airport vision leverages existing airport land and infrastructure to develop in a safe, organized, and operationally efficient manner while retaining the flexibility to adapt to unforeseen circumstances.

Aligning future eastside general aviation-oriented growth with the primary runway maximizes available aeronautical land use and allows orderly future development in the event that funding is no longer available to maintain Runway 4-22 (future 5-23). Positioning a new FBO at the identified eastside location begins the process of incrementally transitioning general aviation operations away from commercial terminal activities. This allows the potential for terminal expansion at its current location, improves overall operational safety, and enhances the experience for all airport users. Relocating the FBO to the eastside location in alignment with Runway 13-31 also takes advantage of existing utilities, constructs the new facility in a convenient location for airport users, and establishes an optimal new orientation for all future eastside development.

Legend

- Ultimate Pavement (20+ years)
- Short-Term Pavement (1-5 years)
- Mid-Term Pavement (6-10 years)
- Long-Term Pavement (11-20 years)
- Airport Property Boundary
- Hangar/Building Within Planning Period
- Hangar/Building Beyond Planning Period
- Nonaeronautical Land Development Area
- Terminal Expansion Area

DEVELOPMENT PHASING

Short-Term - 2022-2026

1 Arrival/Departure Building Improvements (2022)
2 DNR Bituminous Ramp Rehabilitation (2022)
3 Hangar Construction (2022)
4 RSA Improvements (2022)
5 RWY 13 Transition Surface - Esmt E - 2.8 acres (2022)
6 Tree Removal Project (2022) *
7 T-Hangar(s) Taxilane Rehabilitation (2023)
8 T-Hangar(s) Taxiway Rehabilitation (2023)
9 Fuel Farm Improvements (2023)
10 ILS/GS Fiber Optic Repair (2023) *
11 Safety Barricades and Lights (2023) *
12 Taxiway A Rehabilitation (2024)
13 Taxiway A/Fuel Farm Area Rehabilitation (2024)
14 Highway 37 - Hughes Rd Traffic Study (2024)
15 Air Carrier Apron Expansion (2025)
16 Lighted Windcone Installation (2025)
17 Wildlife Fence Improvements (2025)
18 Blast Pad Corrections (2026)
19 Airfield Pavement Design and Construction Phase I (2026)
20 Airfield Pavement Demolition Phase I (2026)

Mid-Term - 2027-2031

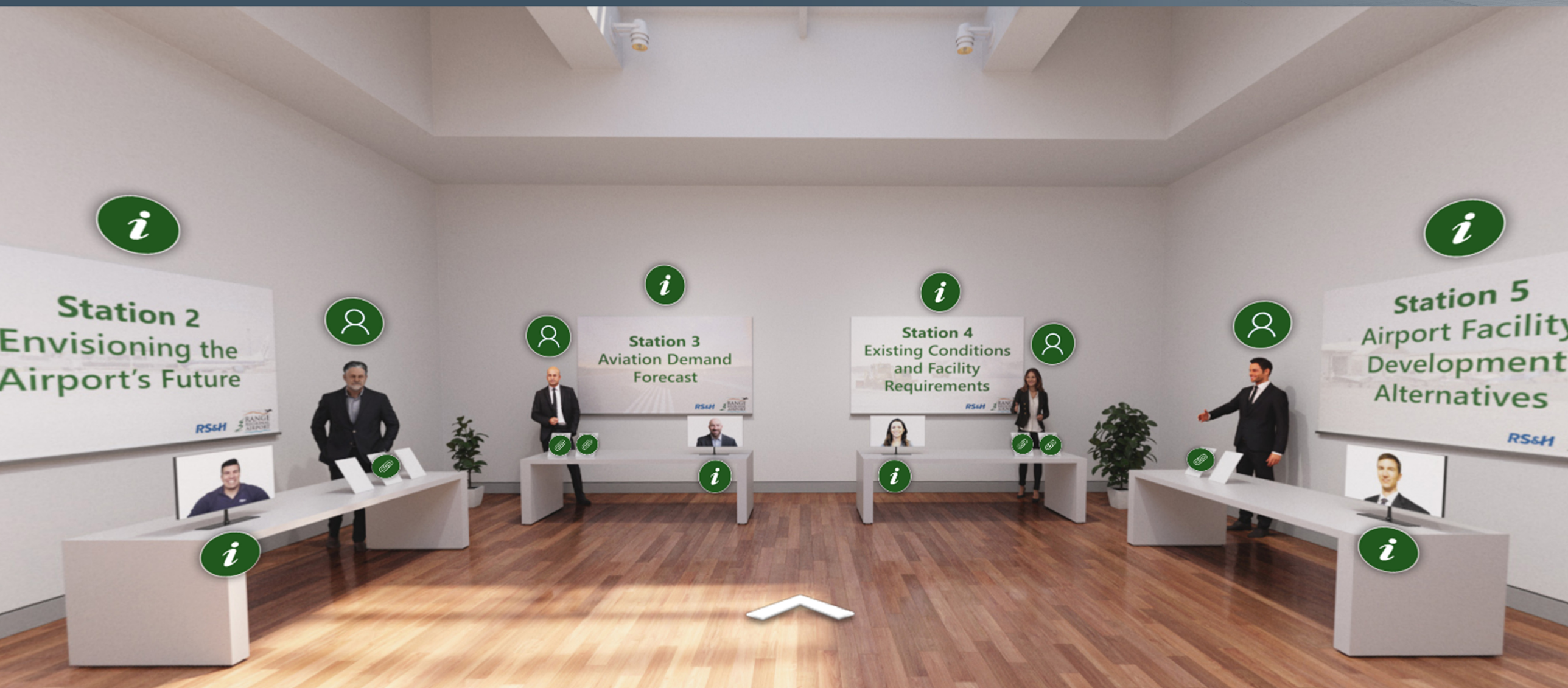
21 Extend RWY 13-31 - Land Acquisition (2028)
22 Extend RWY 13-31/TWY C to 7,400' - Design & Constr (2029)
23 East Side Utility Extension (2030) *
24 Paving of Hughes Road to access East Side GA Area (2030)
25 East Side GA Access Roads and Parking Construction (2030)
26 GA Transient Apron Construction (2031)
27 FBO Facility Construction (2031)
28 FBO Fuel Farm Construction (2031)
29 Nested T-Hangar Construction (2031)

Long-Term - 2032-2041

30 TWY C Rehabilitation (2032)
31 Airfield Pavement Design & Construction Phase II (2033)
32 Airfield Connector Pavement Demolition (2033)
33 Airport Support/Admin/ARFF Facility Relocation (2034)
34 North Perimeter Road (2036)
35 Electrical Vault Relocation (2037)
38 Aircraft Wash Facility Construction (2041) *
36 Airport Parking Study (2039) *
37 Landside Expansion (2040) *

* *Project not shown in graphic*

PUBLIC ENGAGEMENT



RANGE REGIONAL AIRPORT

RS&H

In 2020, when much of the world effectively "shut down" in an effort to halt the spread of the COVID-19 virus, restrictions were put in place in Minnesota preventing traditional in-person public meetings. With need comes innovation, so RS&H and CHAA continued forward by leveraging virtual meeting tools and implementing new information sharing tools to create an interactive multimedia master plan experience for the public.

You can now explore the process and outcomes of the Range Regional Airport Master Plan by scanning the QR code with your device or by entering the following link into your web browser. https://rangeregionalairportmasterplan.com/status.php

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