WORKING PAPER 4

ALTERNATIVES

MARCH 2022

VERSION 3.0

Prepared by RS&H for the
Chisholm Hibbing Airport Authority

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CHAPTER 3

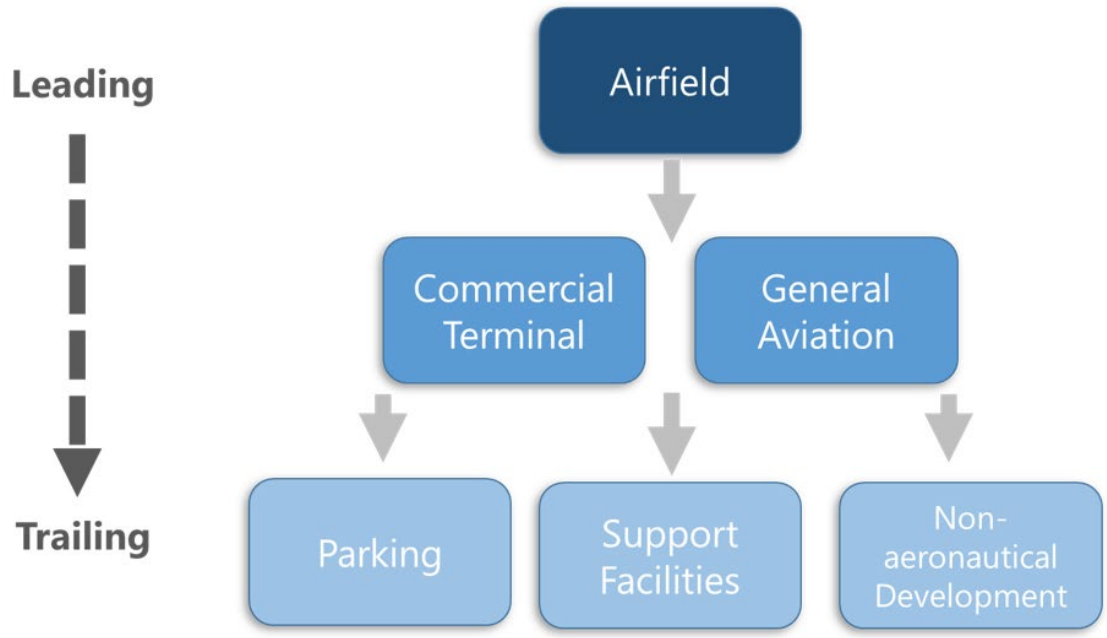
AIRPORT FACILITY DEVELOPMENT ALTERNATIVES

3.1 INTRODUCTION

This chapter identifies and evaluates facility development alternatives for Range Regional Airport based on the facility requirements determined in **Chapter 2, Inventory and Facility Requirements**. The goal of identifying and evaluating various development options is to ensure airport facilities are capable of meeting projected activity demand levels, make efficient and effective use of available airport land, meet FAA airfield design standards, and integrate with a preferred airport management strategy. Development alternatives in this chapter have been thoroughly analyzed, refined, and vetted through stakeholder involvement to establish plans that reflect community values, Airport preferences, and the unique operational nature of Range Regional Airport.

To begin, leading and trailing facility categories are defined to establish a hierarchy relative to the influence each facility has on another. Leading elements include critical airport infrastructure and influence how trailing facility types are developed. At HIB, the leading facilities include the airfield facilities such as runways and taxiways. These are followed by the commercial passenger terminal facilities and general aviation (GA) facilities. Finally, the trailing elements are those whose placement and configuration are influenced and dependent on the leading elements. At HIB, trailing elements include landside vehicle parking, airport support facilities, and nonaeronautical development. **Figure 3-1** shows the relationship between leading and trailing planning elements at Range Regional Airport.

FIGURE 3-1
AIRPORT PLANNING FACILITY CATEGORIES



Source: RS&H Analysis, 2021

3.1.1 Alternatives Development Process

A rational planning process is followed in the development of facility alternatives to meet demand requirements at Range Regional Airport. This process involves the following steps:

- Evaluate and define preferred airport management structure and policies
- Describe and evaluate existing airport land use patterns
- Craft an ultimate on-airport land use pattern vision
- Consider locations of off-airport properties with strategic acquisition significance
- Delineate FAA airspace limitations and existing environmental conditions
- Define facility alternatives evaluation criteria
- Create alternative facility development options in-line with forecast demand, a preferred management/policy structure, and the established airport vision
- Evaluate preferred options against established criteria
- Share analysis information with stakeholders and general public for feedback and insights and refine as appropriate
- Select preferred future development

3.1.2 Alternative Concept Evaluation Criteria

The alternatives process must establish a set of evaluation criteria by which all facility development concepts can be measured. Throughout the alternative development process, evaluations are performed based on guidance provided in the Airport visioning process, aviation industry research, and established planning best practices. At a high level, each facility alternative is evaluated against the following criteria:

- Operational safety and public safety
- Operational efficiency
- FAA airfield design standards for critical aircraft
- Balance of airfield, terminal, and landside facilities
- Resolution of current issues
- Adequate/appropriate level of service provided (pedestrian and vehicular)
- Long-term facility requirements are met
- Ease of implementation
- Costs (capital and operating)
- Flexibility and future expansion potential
- Public and tenant operational impacts mitigated/minimized
- Environmental impacts and sustainability

3.2 AIRPORT MANAGEMENT STRUCTURE ALTERNATIVES

Planning for airport facility development alternatives is directly impacted by strategic management and policy decisions. Therefore, understanding preferred management strategies and future airport staffing needs is critical to the creation of informed airport land use and facility plans. This Master Plan incorporates planning assumptions and growth factors based on future staffing necessary to meet established current and future goals and objectives. Much like the Airport's Capital Improvement Plan (CIP), strategic management decisions should be built on a baseline of the airport's current management staff, organization, roles, and responsibilities. Then, options can be evaluated to understand how current and future demand levels are accommodated. This section identifies the various roles and responsibilities

that currently exist among the Airport's management team and staff, quantifies any surplus/deficit labor capacity for existing and future conditions through a gap analysis[1], and identifies a preferred management structure by which to plan future facility alternatives within the Airport Master Plan.

3.2.1 Airport Staff Roles and Responsibilities

Airports require different levels of management and types of personnel. In general, most airports have a designated individual, or group of individuals, who oversee and manage the operations and facilities. At Range Regional Airport, this responsibility falls under the executive director and assistant director. Due to the size and nature of HIB and the wide variety of daily tasks required to support safe airport operations, administrative staff must have an extensive aviation background and the ability to quickly shift attention from administrative roles to operational support tasks. Similarly, maintenance staff must perform ARFF duties and be versatile enough to safely and effectively operate and maintain a large range of equipment varying from handheld tools to large snow removal machinery.

3.2.1.1 HIB Airport Staffing Baseline Conditions

As a 14 CFR Part 139 (commonly known as "Part 139") certificated commercial service and general aviation airport, HIB facilities are prudently maintained to support a safe operating environment for all operators and users including scheduled air carriers, general aviation users, tenants, employees, and the general public. As of 2021, the current Airport administrative team is made up of two full-time directors and a part-time administrative assistant. The maintenance of the airfield and other Airport facilities is performed by three full-time maintenance positions, one part-time or seasonal maintenance position, and one part-time custodian.

For the purposes of this study, the Airport's management team has been divided into the primary roles and responsibilities of the administrative staff and the maintenance staff. **Table 3-1** shows the current management team at Range Regional Airport.

TABLE 3-1
RANGE REGIONAL AIRPORT MANAGEMENT TEAM

Administration	Maintenance
Executive Director	Airport Maintenance Level 3
Assistant Director	Airport Maintenance Level 2
Administrative Assistant*	Airport Maintenance Level 1
	Airport Maintenance (Seasonal)*
	Custodian*

*Indicates part-time.
Source: Chisholm-Hibbing Airport Authority, 2021

[1] A gap analysis is a method of examining a difference that may exist between the performance ability of current personnel versus required performance necessary to meet future goals or objectives.

3.2.1.2 Administrative Staff Roles and Responsibilities

At Range Regional Airport the roles and responsibilities of the administrative staff are extensive. The executive director works closely with the assistant director and a part-time administrative assistant to ensure the following responsibilities are managed:

Administration and Financial Functions - Airport managers have a responsibility to handle a variety of administrative duties as well as developing a budget.

- General administrative functions
- Budget development
- Airline agreements, tenant leases, and minimum standards
- Emergency preparedness

Legal and Regulatory – Airport managers have a responsibility to abide by FAA, federal, state, and locally defined rules, standards, policies, and guidelines.

Maximization of Resources

- Coordination with stakeholders
- Versatility of airport management and staff
- Management of staff

Strategic Planning

- Airport vision and mission
- Update airport master plans and layout plans
- Acquisition of land
- Land uses and zoning
- Local plans

Environmental Planning and Public Safety

- Environmental issues
- Airport safety

Level of Service

- Responding to customer inquiries
- Americans with Disabilities Act (ADA) compliance
- Cleaning and maintenance of facilities

Communication and Coordination

- Open lines of communication

Goodwill and Public Relations

- Marketing strategies
- Public statements

3.2.1.3 Maintenance Roles and Responsibilities

The full-time three-person maintenance team at Range Regional Airport is made up of one level-three position, one level-two position, and one level-one (or "line") position. The level two and three maintenance staff (2 positions) have the responsibility of ensuring the airfield condition is always maintained in compliance with Part 139 certificate requirements. This is a challenging task at HIB given

the range in weather conditions experienced on an annual basis. At a minimum, the maintenance crew must be trained to mow the airfield, operate snow removal equipment (SRE) to clear all airfield pavements during winter conditions, clear wildlife hazards from the airport operations area, and perform aircraft rescue and firefighting (ARFF) duties during emergency responses. As a small but growing commercial service airport, the Executive Director and Assistant Director still regularly assist in these roles on an as-needed basis. As the airport continues to grow, a reassessment of the degree administrative staff plays in performing maintenance duties is warranted.

The level one maintenance position (line position) supports fixed-based operator (FBO) operations for aircraft services such as fueling, deicing, and ground support equipment (GSE). The part-time custodian provides cleaning and sanitation services to the terminal building. Additionally, all Airport staff currently assist in ground handing operations to support air carrier operations.

The below list provides a more detailed account of the roles and responsibilities of the maintenance team members:

Administrative Functions

- Responding to inquiries
- CIP management
- Knowledge and adherence to FAA and state DOT regulations
- Auditing and reporting of facilities and equipment

Airfield, Building, and Grounds Maintenance

- Airfield maintenance duties
- Building maintenance duties
- Grounds maintenance duties
- Equipment maintenance duties (SRE, ARFF truck, mowers, generators, vehicles, etc.)

ARFF, Fueling, and Deicing Support

- ARFF
- Aircraft fueling
- Aircraft deicing

Daily operations

- Weather equipment and radio communication
- Airfield inspection
- Notice to airmen (NOTAM) issuances/cancellations
- Ground Support Equipment (GSE) operations
- Security

Emergency Preparedness

- Emergency education and trainings
- Staffing

3.2.1.4 Dedicated and Shared Airport Staff

Defining staff roles is an important part of managing and staffing an airport. By dedicating individuals to a particular set of tasks, the requisites for the position are clearly defined and the individual can hone specific skills through repetition to increase their efficiency and effectiveness. Comparatively, a shared staffing approach requires staff to be versatile and relatively skilled across a wide range of airport functions. Obtaining, training, and retaining staff with diverse skillsets can all prove challenging because of the high marketability these individuals ultimately command within the labor force.

Both types of management and staffing approaches are used by airports. An airport's approach is often dictated by constraints such as budget, applicant pools, and management history. For Range Regional Airport, management has a set budget for staffing, and one of the major tasks is ensuring that the airfield is maintained regularly and on-time especially during periods of inclement weather.

Given their current job responsibilities at HIB, the executive director and assistant director are the only two positions that are considered shared staff. This approach has worked for the Airport under its current organization and facility layout. Should the Airport expand and move from a centralized support facility pattern to a more decentralized pattern under future development preferences, staffing and workload adjustments that move toward task specialization should be considered as well as additional staff to support those needs.

The maintenance team does a wide variety of tasks on a daily basis and may assist in the completion of some unexpected jobs, but in general they are dedicated to maintenance and repair of all Airport facilities.

3.2.2 Layout-Based Management Alternatives

Two key factors are applied in establishing the preferred management structure that is used as the baseline for developing facility alternatives. These two factors are:

1. The types of services offered, and
2. Where support facilities are located in relation to one another.

The facility types commonly found among small airports include:

Commercial passenger facilities

- Passenger terminal building
- Landside / Auto parking facilities
- Air carrier apron
- GSE storage
- Glycol operations, storage, and recovery

General aviation facilities

- FBO facilities
- Hangars and T-hangars

Airport support facilities

- Administrative spaces

- ARFF facilities
- Field maintenance storage and repair facilities
- Fuel farm and fuel truck staging
- Glycol storage, truck staging, and recovery

Aircraft maintenance facilities

- Airframe
- Avionics
- Maintenance, Repair, and Overhaul (MRO) facilities

Cargo facilities

- Warehouses
- Loading docks
- Parking areas
- Aprons

Other aeronautical facilities

- NAVAIDs
- Electrical vaults

Non-aeronautical facilities

- Manufacturing
- Warehouses

The following three Airport support facility layout alternatives, provide a high-level organization for some or all of the facilities listed above:

1. **Centralized Layout -** The centralized layout alternative is built on the concept of the Airport's core (at HIB, the commercial terminal area). In this layout, Airport support facilities are in close proximity to one another regardless of their service or use.

2. **Decentralized Layout** - The decentralized layout alternative has no specific core and instead disperses the development of future facilities and buildings to logical locations for long-term development given their service or use.

3. **Satellite Hybrid Layout** - The satellite hybrid layout alternative is a combination of the centralized and decentralized layout alternatives. In it, some Airport facilities are centralized in a core area, however, other facilities with similar uses and adjacency benefits are located as satellite facilities outside of the Airport's core.

3.2.2.1 Centralized Layout Alternative

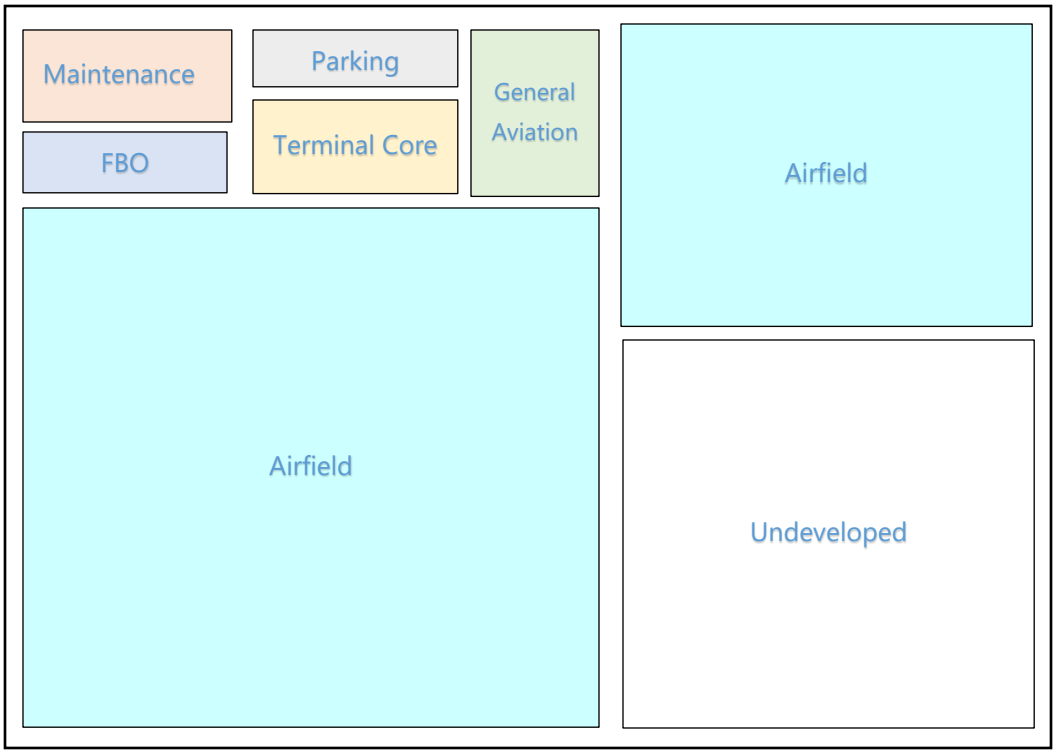
The centralized layout alternative clusters the majority, if not all of the Airport's facilities and buildings within the primary core of Airport support facilities. This layout is Range Regional Airport's current configuration, which is common among smaller airports before they experience extensive growth and

development. Its proximal layout supports a management and staffing structure complimentary to having fewer shared staff, but depending on workload, risks creating a higher rate of staff exhaustion due to the degrees of responsibility held.

The centralized layout alternative maximizes the use of personnel and resources to the extent possible and is generally the least costly alternative of the three discussed. Given the proximity to the other facilities, it is typically easier for administrative staff to share responsibilities and assist operations during peak demand times or other time sensitive events such as snow removal events. Administrative staff can then return to administrative functions as time permits. This versatility and ability for administrative staff to support operations is beneficial from an operations perspective, however, the time spent by management supporting operations and maintenance tasks is time not spent focusing on the administrative responsibilities necessary to effectively manage the Airport. This is why centralizing facilities does not necessarily guarantee greater staff efficiency. For small airports, shared responsibility is often a beneficial feature, but as an airport grows it can also be detrimental as the director and staff become overburdened with too many responsibilities. This alternative is not likely to be sustainable for a growing airport such as HIB and can only exist for as long as an airport's activity allows it.

Figure 3-2 shows a general diagram for one option of the centralized layout alternative.

FIGURE 3-2
CENTRALIZED LAYOUT ALTERNATIVE DIAGRAM



Source: RS&H, 2021

3.2.2.2 Decentralized Layout Alternative

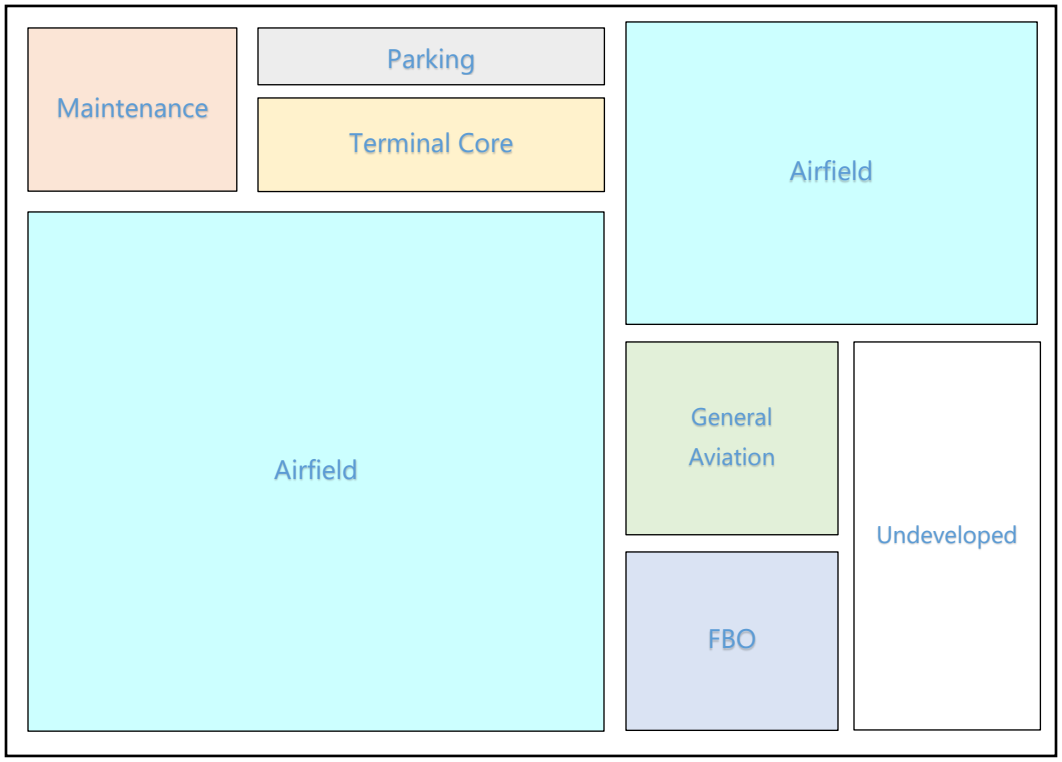
The decentralized layout alternative locates facilities and services to logical areas of the Airport where they can function with both locational and adjacency benefits, and often with less constraints. This type of layout is common among larger airports because, as operating demands increase, there is a greater need for management staff, additional facilities, and support function space. Overall, this spatially driven layout compliments a management style that utilizes more dedicated and specialized staff. It's important to recognize that adding staff increases costs to pay for the personnel.

For Range Regional Airport, it is logical for either the FBO or maintenance facilities to be decentralized first, and then other general aviation facilities would move as demand and varying factors necessitate it. If the FBO were to be decentralized, a key factor would be whether the FBO remained Airport-owned, or whether land/facilities were leased to a private entity. This management alternatives analysis does not delve into the benefits and costs associated with public and private FBOs. These would need to be evaluated as part of a more targeted study.

Having facilities and services decentralized does introduce the need for a greater number of Airport staff, but the overall impact can be positive because less variability in staff responsibilities often enables them to be more effective at their tasks, more satisfied in the position, and can contribute to higher employee retention rates when adequate development opportunities exist. The decentralized facility layout also allows for the opportunity to share responsibilities/services with the city or county, for example, ARFF emergency response duties. In this layout concept at HIB, needed staff would likely be an operations manager to take over some responsibilities currently held by administrative staff, and either an FBO manager or an additional senior level maintenance personnel.

When compared to a centralized layout, the decentralized layout has the potential to improve an airport's efficiency because administrative staff have more time to focus on their specific job responsibilities with less interruptions by time-sensitive operations requirements. To sustain the decentralized layout alternative an airport would need to invest in the different staff areas under the assumption administrative staff would not perform shared responsibilities as frequently. As with all management structures, attracting and retaining staff to ensure facilities and services are not neglected is critical. The decentralized concept allows for a management structure that enables attraction and retention of staff. **Figure 3-3** shows a general diagram for one option of the decentralized layout alternative.

FIGURE 3-3
DECENTRALIZED LAYOUT ALTERNATIVE DIAGRAM



Source: RS&H, 2021

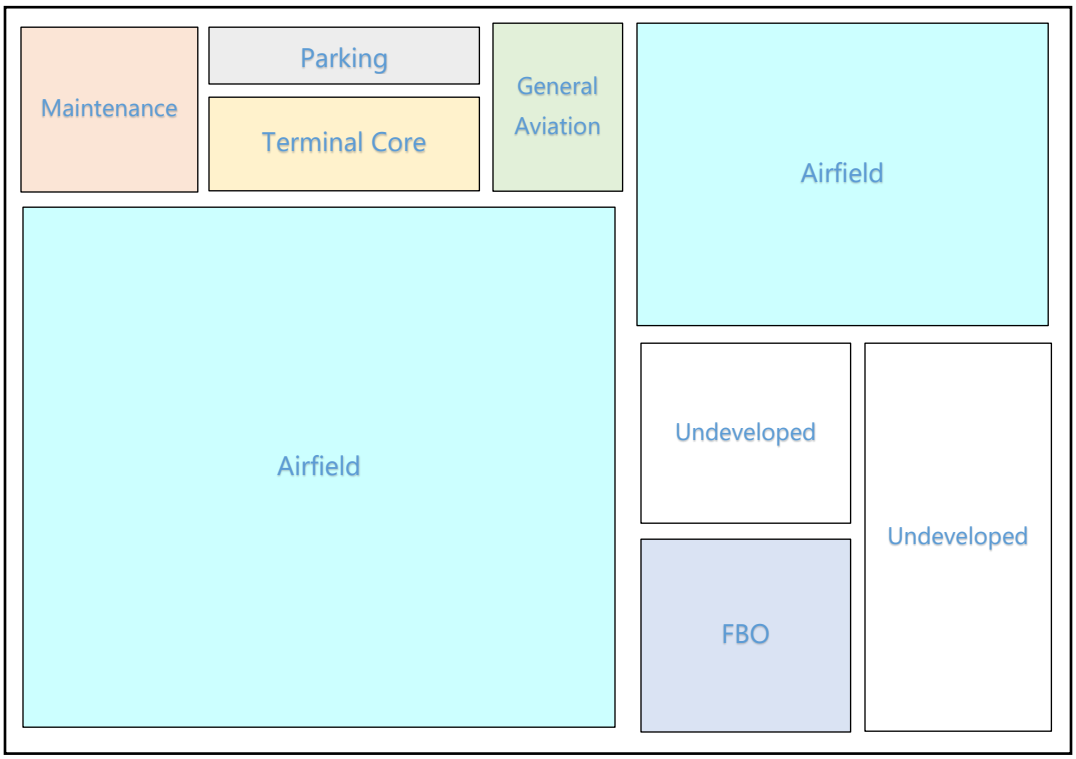
3.2.2.3 Satellite Hybrid Layout Alternative

The satellite hybrid layout alternative makes similar logical moves for facilities and services and has similar benefits to the decentralized layout alternative, but does so more incrementally, keeping the majority of facilities centrally located in the Airport's core. This type of layout alternative can be an interim step as an airport shifts from a centralized to decentralized layout, or it can be permanent if specific facilities and services dominate the airport and require a move from the core to operate more efficiently. For instance, if general aviation facilities accounted for the greatest amount of activity, then these facilities could be part of the satellite group managed separate from the other core facilities.

Similar to the decentralized alternative, this alternative requires additional staff dedicated to newly developed facilities. Potential positions for HIB would include either an FBO manager or an additional high level maintenance personnel. Because the central core would still house the majority of the Airport's activity, there would be less justification to incorporate a new operations manager position. This concept assumes a more "as-needed" approach to management, dedicating staff for the services with the highest demand. From a cost perspective, the satellite hybrid approach would increase labor costs more than the centralized layout alternative, but this increase is anticipated to be less than a fully decentralized layout because administrative staff still share some duties. This makes the satellite hybrid layout a reasonable near-term compromise to transitioning directly into a decentralized layout because staffing efficiencies can still be achieved at a lower overall expense.

The satellite hybrid alternative enables the director to dedicate new staff where they are needed most. Meanwhile, the remaining facilities and services are still capable of being managed by the existing team. **Figure 3-4** shows a general diagram for one option of the hybrid satellite layout alternative.

FIGURE 3-4
SATELLITE HYBRID LAYOUT ALTERNATIVE DIAGRAM



Source: RS&H, 2021

3.2.3 Staffing Gap Analysis

The gap analysis method of comparing actual performance with desired performance was used to evaluate baseline (existing) Airport management staff counts against existing requirements and surplus/deficiencies created under the three conceptual layouts. An ordinal scale (3=high workload; 2=moderate workload; 1=low workload) was used to quantify estimates of time and energy each team member typically contributes to the Airport's management tasks on a weekly basis. An average of each staff member's workload was calculated to quantify planning factors for roles and utilization. The purpose of this analysis is to strategically balance workloads and determine staffing impacts under alternative facility layout conditions.

3.2.3.1 Existing Conditions

The gap analysis for baseline 2021 conditions, shown in **Table 3-2**, indicates the Airport's administrative team is overloaded with high average workload on most tasks. It also shows that the Airport's maintenance team has a moderate-to-high utilization in its tasks. These initial findings suggest that the Airport would benefit by hiring a full-time administrative assistant and a second maintenance position to

better balance the shared workload of existing administrative staff. These proposed changes are assumed to be necessary in all evaluated alternatives, with increased workloads anticipated relative to the Airport's future operational growth.

3.2.3.2 Centralized Layout Alternative

The centralized layout alternative facilitates creation of two new full-time positions over the planning period: one administrative position and one maintenance position. Because the centralized layout alternative does not assume any new development, administrative staff (presently the executive director and assistant director) still maintain significantly high average workload per task values. The workload per task for the remaining airport staff remains consistent because it assumes that as workload increases, staff increases marginally, as noted previously in **Section 3.2.2.1**. Without any other administrative team additions or adjustments to roles and responsibilities, it is anticipated under this development layout that various members of the Airport's management team continue to be overburdened by workload demands. **Table 3-3** shows the gap analysis for the centralized layout alternative.

3.2.3.3 Decentralized Layout Alternatives

The decentralized layout alternatives facilitate creation of four new full-time positions over the planning period. All decentralized layout alternatives assume that management requires another administrative position. For the sake of this study, this position is titled "operations manager". The operations manager position relieves a significant amount of the routine daily operations workload currently undertaken by the executive director and assistant director, resulting in lower average workload per task overall for the entire administrative staff. Additionally, all decentralized alternatives assume the same staffing additions as the centralized layout alternative to offset the overall growth of the Airport.

The decentralized layout alternatives are further broken down into two different variations. The first variation, decentralized layout alternative (D-1), is centered on the relocation of the FBO outside of the Airport's core. With this change the Airport is assumed to require addition of an FBO manager to oversee FBO services. The degree of utilization for administrative tasks in D-1 would vary depending on whether or not the FBO is managed by the Airport or leased to a private company. In total, alternative D-1 creates three new administrative positions and two new maintenance positions over the planning period. Overall, the decentralized alternatives result in the lowest average workload per task and the most evenly distributed workload of any alternative. **Table 3-4** shows the gap analysis for the D-1 alternative.

The other decentralized layout alternative (D-2) assumes that under this pattern of airport development, the maintenance team count will need to increase rather than creating a new position for an FBO manager, resulting in a new level 3 maintenance position. This added senior level maintenance position would enable greater assistance in the expanded facilities and reduce the overload workload per task for the maintenance team keeping a high level of service and reducing chances for exhaustion. In total, alternative D-2 creates two new administrative positions and two new maintenance positions over the planning period. **Table 3-5** shows the gap analysis for the D-2 alternative.

3.2.3.4 Hybrid Satellite Layout Alternatives

Unlike the decentralized layout alternatives, the hybrid satellite alternatives 1 and 2 (H-1 and H-2) assume that, because the majority of facilities are still located in the Airport's core, the administrative team can

still adequately function without adding an operations manager. However, under this structure there is still significant workload demand on the executive director and assistant director. Akin to the other three alternatives, both H-1 and H-2 assume the same staffing additions to offset the overall growth of the Airport.

The H-1 alternative follows the same assumption as alternative D-1, adding an FBO manager to address the relocated FBO as a satellite of the Airport's core. The results of this gap analysis show that while the added administrative role would slightly decrease the average workload of the administrative staff, they may still experience high workloads, dependent upon the skillset and versatility of a new FBO manager. In total, alternative H-1 creates two new administrative positions and two new maintenance positions over the planning period. **Table 3-6** shows the gap analysis for the H-1 alternative.

The H-2 alternative follows the same assumption as alternative D-2, by adding a senior level 3 maintenance position to address larger and more expansive facility needs. This alternative decreases the overall workload per task for the maintenance team but results in a much higher average workload per task for the administrative team. The lack of additional designated FBO staff does require the administrative team or members of the maintenance staff to support operations as needed during peak times. In total, alternative H-2 creates one new administrative position and two new maintenance positions over the planning period. **Table 3-7** shows the gap analysis for the H-2 alternative.

TABLE 3-2
BASELINE CONDITIONS (2021) GAP ANALYSIS

		Administration			Maintenance					
	Task / Responsibility	**Executive Director**	**Assistant Director**	**Administrative Assistant**	**Airport Maintenance Level 3**	**Airport Maintenance Level 2**	**Airport Maintenance (Seasonal)**	**Airport Maintenance Level 1 (Line)**	**Custodian**	**Meets Requirements**
	Personnel	1	1	1	1	1	1	1	1	
	Status	Full	Full	Part	Full	Full	Part	Full	Part	
Dedicated	*General Administrative Functions*	3	3	1						No
Dedicated	*Financial / Budget*	3	3							No
Dedicated	*Accounting / Book Keeping*	3	3							No
Dedicated	*Property / Leases*	3	3							No
Dedicated	*Legal / Regulatory*	3	3							No
Dedicated	*Planning / Environmental*	3	3							No
Dedicated	*Aviation Operations Management*	3	3							No
Dedicated	*Emergency Planning / Training*	3	3							No
Dedicated	*Media / Communication*	3	2							No
Dedicated	*Public Relations*	3	2							No
Dedicated	*Meet and Greet*	2	3							No
Dedicated	*Safety / Security*	3	2							No
Shared	*Fixed-Based Operator Management*							3		No
Shared	*Aircraft Fueling*							3		No
Shared	*Ground Support Equipment Services*							3		No
Shared	*Mowing*	1	1		3	3	3			No
Shared	*Snow Removal*	3	3		3	3	2			Yes
Shared	*Building / General Maintenance*				2	2	2		2	No
Shared	*ARFF Support*	1	1		2	2	2			No
Shared	*Wildlife / Nuissance Removal*	1	1		2	2	2			No
Shared	*Professional Development / Training*	3	3	1	2	2	1	1	1	No
	Workload	High	High	Low	Mod.	Mod.	Mod.	Mod.	Low	
	Average Workload per Task	3.2	3.0	1.0	2.3	2.3	2.0	2.5	1.5	

Note: The average workload per task for the administrative positions includes a weighted addition of 25%, for shared responsibilities.
Source: RS&H, 2021

TABLE 3-3
CENTRALIZED LAYOUT ALTERNATIVE GAP ANALYSIS

		Administration			Maintenance						
	Task / Responsibility	**Executive Director**	**Assistant Director**	**Administrative Assistant**	**Airport Maintenance Level 3**	**Airport Maintenance Level 2**	**Airport Maintenance Level 2**	**Airport Maintenance (Seasonal)**	**Airport Maintenance Level 1 (Line)**	**Custodian**	**Meets Requirements**
	Personnel	1	1	1	1	1	**1**	1	1	1	
	Status	Full	Full	**Full**	Full	Full	**Full**	Part	Full	Part	
Dedicated	*General Administrative Functions*	**3**	**3**	**2**							**No**
	Financial / Budget	**3**	**3**	**2**							**No**
	Accounting / Book Keeping	**3**	**3**	**2**							**No**
	Property / Leases	**3**	**3**	**2**							**No**
	Legal / Regulatory	**3**	**3**	**2**							**No**
	Planning / Environmental	**3**	**3**	**2**							**No**
	Aviation Operations Management	**3**	**3**	**2**							**No**
	Emergency Planning / Training	**3**	**3**	**2**							**No**
	Media / Communication	**3**	**2**								**No**
	Public Relations	**3**	**2**								**No**
	Meet and Greet	**2**	**3**								**No**
	Safety / Security	**3**	**2**								**No**
Shared	*Fixed-Based Operator Management*								**3**		**No**
	Aircraft Fueling								**3**		**No**
	Ground Support Equipment Services								**3**		**No**
	Mowing	**1**	**1**		**3**	**3**	**3**	**3**			**Yes**
	Snow Removal	**1**	**1**		**3**	**3**	**3**	**3**			**Yes**
	Building / General Maintenance				**2**	**2**	**2**	**2**		**2**	**Yes**
	ARFF Support	**1**	**1**		**2**	**2**	**2**	**2**			**Yes**
	Wildlife / Nuissance Removal	**1**	**1**		**2**	**2**	**2**	**2**			**Yes**
	Professional Development / Training	**3**	**3**	**1**	**2**	**2**	**2**	**1**	**1**	**1**	**Yes**
	Workload	High	High	Mod.	Mod.	Mod.	Mod.	Mod.	Mod.	Low	
	Average Workload per Task	**3.1**	**2.9**	**1.9**	**2.3**	**2.3**	**2.3**	**2.2**	**2.5**	**1.5**	

Note: New positions are identified in red text. The average workload per task for the administrative positions includes a weighted addition of 25%, for shared responsibilities.
Source: RS&H, 2021

TABLE 3-4
DECENTRALIZED LAYOUT ALTERNATIVE 1 (D-1) GAP ANALYSIS

		Administration				Maintenance							
	Task / Responsibility	**Executive Director**	**Assistant Director**	**Operations Manager**	**Administrative Assistant**	**Airport Maintenance Level 3**	**Airport Maintenance Level 2**	**Airport Maintenance Level 2**	**Airport Maintenance (Seasonal)**	**FBO Manager**	**Airport Maintenance Level 1 (Line)**	**Custodian**	**Meets Requirements**
	Personnel	1	1	**1**	1	1	1	**1**	1	**1**	1	1	
	Status	Full	Full	**Full**	**Full**	Full	Full	**Full**	Part	**Full**	Full	Part	
Dedicated	*General Administrative Functions*	**2**	**2**	**2**	**3**								**Yes**
Dedicated	*Financial / Budget*	**2**	**2**	**3**	**2**								**Yes**
Dedicated	*Accounting / Book Keeping*	**2**	**2**	**3**	**2**								**Yes**
Dedicated	*Property / Leases*	**2**	**2**	**3**	**2**								**Yes**
Dedicated	*Legal / Regulatory*	**3**	**3**	**1**	**2**								**Yes**
Dedicated	*Planning / Environmental*	**3**	**3**	**1**	**2**								**Yes**
Dedicated	*Aviation Operations Management*	**3**	**2**	**2**	**2**								**Yes**
Dedicated	*Emergency Planning / Training*	**3**	**2**	**2**	**2**								**Yes**
Dedicated	*Media / Communication*	**2**	**2**	**2**									**Yes**
Dedicated	*Public Relations*	**2**	**2**	**2**									**Yes**
Dedicated	*Meet and Greet*	**2**	**2**	**2**									**Yes**
Dedicated	*Safety / Security*	**3**	**2**	**1**									**Yes**
Shared	*Fixed-Based Operator Management*									**3**	**3**		**Yes**
Shared	*Aircraft Fueling*									**3**	**3**		**Yes**
Shared	*Ground Support Equipment Services*									**3**	**3**		**Yes**
Shared	*Mowing*	**1**	**1**			**3**	**3**	**3**	**3**				**Yes**
Shared	*Snow Removal*	**1**	**1**			**3**	**3**	**3**	**3**				**Yes**
Shared	*Building / General Maintenance*					**2**	**2**	**2**	**2**			**2**	**Yes**
Shared	*ARFF Support*	**1**	**1**			**2**	**2**	**2**	**2**				**Yes**
Shared	*Wildlife / Nuissance Removal*	**1**	**1**			**2**	**2**	**2**	**2**				**Yes**
Shared	*Professional Development / Training*	**2**	**2**	**1**	**1**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**Yes**
	Workload	High	High	Mod.	Mod.	Mod.	Mod.	Mod.	Mod.	Mod.	Mod.	Low	
	Average Workload per Task	**2.6**	**2.3**	**2.0**	**2.0**	**2.3**	**2.3**	**2.3**	**2.2**	**2.5**	**2.5**	**1.5**	

Note: New positions are identified in red text. The average workload per task for the administrative positions includes a weighted addition of 25%, for shared responsibilities.
Source: RS&H, 2021

TABLE 3-5
DECENTRALIZED LAYOUT ALTERNATIVE 2 (D-2) GAP ANALYSIS

		Administration				Maintenance							
	Task / Responsibility	**Executive Director**	**Assistant Director**	**Operations Manager**	**Administrative Assistant**	**Airport Maintenance Level 3**	**Airport Maintenance Level 3**	**Airport Maintenance Level 2**	**Airport Maintenance Level 2**	**Airport Maintenance (Seasonal)**	**Airport Maintenance Level 1 (Line)**	**Custodian**	**Meets Requirements**
	Personnel	1	1	**1**	1	1	**1**	1	**1**	1	1	1	
	Status	Full	Full	**Full**	**Full**	Full	**Full**	Full	**Full**	Part	Full	Part	
Dedicated	*General Administrative Functions*	**2**	**2**	**2**	**3**								**Yes**
Dedicated	*Financial / Budget*	**2**	**2**	**3**	**2**								**Yes**
Dedicated	*Accounting / Book Keeping*	**2**	**2**	**3**	**2**								**Yes**
Dedicated	*Property / Leases*	**2**	**2**	**3**	**2**								**Yes**
Dedicated	*Legal / Regulatory*	**3**	**3**	**1**	**2**								**Yes**
Dedicated	*Planning / Environmental*	**3**	**3**	**1**	**2**								**Yes**
Dedicated	*Aviation Operations Management*	**3**	**2**	**2**	**2**								**Yes**
Dedicated	*Emergency Planning / Training*	**3**	**2**	**2**	**2**								**Yes**
Dedicated	*Media / Communication*	**2**	**2**	**2**									**Yes**
Dedicated	*Public Relations*	**2**	**2**	**2**									**Yes**
Dedicated	*Meet and Greet*	**2**	**2**	**2**									**Yes**
Dedicated	*Safety / Security*	**3**	**2**	**1**									**Yes**
Shared	*Fixed-Based Operator Management*										**3**		**No**
Shared	*Aircraft Fueling*										**3**		**No**
Shared	*Ground Support Equipment Services*										**3**		**No**
Shared	*Mowing*					**3**	**3**	**3**	**3**	**2**			**Yes**
Shared	*Snow Removal*					**3**	**3**	**3**	**3**	**2**			**Yes**
Shared	*Building / General Maintenance*					**2**	**2**	**1**	**1**	**2**		**2**	**Yes**
Shared	*ARFF Support*					**2**	**2**	**2**	**2**	**2**			**Yes**
Shared	*Wildlife / Nuissance Removal*					**1**	**1**	**2**	**2**	**2**			**No**
Shared	*Professional Development / Training*	**2**	**2**	**2**	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**Yes**
	Workload	High	High	Mod.	Mod.	Mod.	Mod.	Low	Low	Mod.	Mod.	Low	
	Average Workload per Task	**2.5**	**2.2**	**2.1**	**2.0**	**2.2**	**2.2**	**2.0**	**2.0**	**1.8**	**2.5**	**1.5**	

Note: New positions are identified in red text. The average workload per task for the administrative positions includes a weighted addition of 25%, for shared responsibilities.
Source: RS&H, 2021

TABLE 3-6
SATELLITE HYBRID LAYOUT ALTERNATIVE ONE (H-1) GAP ANALYSIS

		Administration			Maintenance							
	Task / Responsibility	**Executive Director**	**Assistant Director**	**Administrative Assistant**	**Airport Maintenance Level 3**	**Airport Maintenance Level 2**	**Airport Maintenance Level 2**	**Airport Maintenance (Seasonal)**	**FBO Manager**	**Airport Maintenance Level 1 (Line)**	**Custodian**	**Meets Requirements**
	Personnel	1	1	1	1	1	**1**	1	**1**	1	1	
	Status	Full	Full	**Full**	Full	Full	**Full**	Part	**Full**	Full	Part	
Dedicated	*General Administrative Functions*	**3**	**3**	**3**								**Yes**
	Financial / Budget	**3**	**3**	**3**								**Yes**
	Accounting / Book Keeping	**3**	**3**	**3**								**Yes**
	Property / Leases	**3**	**3**	**3**								**Yes**
	Legal / Regulatory	**3**	**3**	**3**								**Yes**
	Planning / Environmental	**3**	**3**	**3**								**Yes**
	Aviation Operations Management	**3**	**3**	**3**								**Yes**
	Emergency Planning / Training	**3**	**3**	**3**								**Yes**
	Media / Communication	**3**	**2**	**1**								**Yes**
	Public Relations	**3**	**2**	**1**								**Yes**
	Meet and Greet	**3**	**2**	**1**								**Yes**
	Safety / Security	**2**	**3**	**1**								**Yes**
Shared	*Fixed-Based Operator Management*								**3**	**3**		**Yes**
	Aircraft Fueling								**3**	**3**		**Yes**
	Ground Support Equipment Services								**3**	**3**		**Yes**
	Mowing	**1**	**1**		**3**	**3**	**3**	**3**				**Yes**
	Snow Removal	**1**	**1**		**3**	**3**	**3**	**3**				**Yes**
	Building / General Maintenance				**2**	**2**	**2**	**2**			**2**	**Yes**
	ARFF Support	**1**	**1**		**2**	**2**	**2**	**2**				**Yes**
	Wildlife / Nuissance Removal	**1**	**1**		**2**	**2**	**2**	**2**				**Yes**
	Professional Development / Training	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**Yes**
	Workload	High	High	Mod.	Mod.	Mod.	Mod.	Mod.	Mod.	Mod.	Low	
	Average Workload per Task	**3.1**	**2.9**	**2.2**	**2.3**	**2.3**	**2.3**	**2.3**	**2.8**	**2.8**	**1.5**	

Note: New positions are identified in red text. The average workload per task for the administrative positions includes a weighted addition of 25%, for shared responsibilities.
Source: RS&H, 2021

TABLE 3-7
SATELLITE HYBRID LAYOUT ALTERNATIVE 2 (H-2) GAP ANALYSIS

		Administration			Maintenance							
	Task / Responsibility	**Executive Director**	**Assistant Director**	**Administrative Assistant**	**Airport Maintenance Level 3**	**Airport Maintenance Level 3**	**Airport Maintenance Level 2**	**Airport Maintenance Level 2**	**Airport Maintenance (Seasonal)**	**Airport Maintenance Level 1 (Line)**	**Custodian**	**Meets Requirements**
	Personnel	1	1	1	1	**1**	1	**1**	1	1	1	
	Status	Full	Full	**Full**	Full	**Full**	Full	**Full**	Part	Full	Part	
Dedicated	*General Administrative Functions*	**3**	**3**	**3**								**Yes**
	Financial / Budget	**3**	**3**	**3**								**Yes**
	Accounting / Book Keeping	**3**	**3**	**3**								**Yes**
	Property / Leases	**3**	**3**	**3**								**Yes**
	Legal / Regulatory	**3**	**3**	**3**								**Yes**
	Planning / Environmental	**3**	**3**	**3**								**Yes**
	Aviation Operations Management	**3**	**3**	**3**								**Yes**
	Emergency Planning / Training	**3**	**3**	**3**								**Yes**
	Media / Communication	**3**	**2**	**1**								**Yes**
	Public Relations	**3**	**2**	**1**								**Yes**
	Meet and Greet	**3**	**3**									**Yes**
	Safety / Security	**3**	**3**									**Yes**
Shared	*Fixed-Based Operator Management*	**1**	**1**	**1**						**3**		**Yes**
	Aircraft Fueling	**1**	**1**	**1**						**3**		**Yes**
	Ground Support Equipment Services	**1**	**1**	**1**						**3**		**Yes**
	Mowing	**1**	**1**		**3**	**3**	**2**	**2**	**2**			**Yes**
	Snow Removal	**1**	**1**		**3**	**3**	**2**	**2**	**2**			**Yes**
	Building / General Maintenance				**1**	**1**	**2**	**2**	**2**		**2**	**Yes**
	ARFF Support	**1**	**1**		**2**	**2**	**1**	**1**	**2**			**Yes**
	Wildlife / Nuissance Removal	**1**	**1**		**2**	**2**	**1**	**1**	**2**			**Yes**
	Professional Development / Training	**1**	**1**	**1**	**3**	**3**	**2**	**2**	**1**	**1**	**1**	**Yes**
	Workload	High	High	Mod.	Mod.	Mod.	Low	Low	Mod.	Mod.	Low	
	Average Workload per Task	**3.2**	**3.1**	**2.1**	**2.3**	**2.3**	**1.7**	**1.7**	**1.8**	**2.5**	**1.5**	

Note: New positions are identified in red text. The average workload per task for the administrative positions includes a weighted addition of 25%, for shared responsibilities.
Source: RS&H, 2021

3.2.4 Management Alternatives and Gap Analysis Summary

A comprehensive airport management plan requires careful thought and insight to required tasks, workload, timing, cost, and overall output generated by staff. There is no single correct answer to developing a management structure, but the intention of looking at staffing needs and the impact of facility development alternatives on staffing requirements is the logical starting point for defining future positions on a team that strategically balance overall staff responsibilities and utilization.

This high-level review of airport staff current roles and responsibilities indicates a significant workload demand for all staff, with an especially imbalanced workload for administrative staff. Review of maintenance team responsibilities and utilization indicates all existing positions are necessary with significant workload increases during peak times which lead to administrative staff supporting operations and maintenance duties.

The potential layout alternatives for the Airport show that it could retain a centralized core with all of its facilities in the terminal area for some time or strategic decisions can be made to begin relocating some facilities/services outside the core, as shown in the decentralized and hybrid satellite alternatives. Regardless of the preferred management direction taken, it is evident that growth experienced at HIB will require additional personnel to help maintain a safe and thriving airport environment.

The gap analyses for each layout alternative indicates all staff are utilized and necessary today and over the 20-year planning horizon. Two of the existing part-time positions – administrative assistant and custodian – should be considered for near-term conversion to full-time. Likewise, the immediate addition of a new level 2 maintenance position would greatly alleviate imbalances in administrative staff workload and utilization.

The gap analysis of the centralized layout alternative (which grows Airport support facilities under the existing condition), indicates that all personnel will retain a very high workload which ultimately introduces potential risks to safety and service quality. The gap analysis of D-1 and D-2 introduces the most notable changes for reducing the very high utilization of the administration team, by adding an operations manager, and an FBO manager or additional maintenance position. The H-1 and H-2 alternatives suggest the potential for achieving smaller incremental improvements to average staff workload, with more dramatic improvements for maintenance personnel.

Understanding the benefits, challenges, and opportunities presented within these varied approaches to airport management planning, this Master Plan facility development alternatives analysis will move forward with the assumption that HIB will gradually move away from a centralized layout toward a decentralized or satellite hybrid facility layout to better balance staff responsibilities and optimize use of available resources.

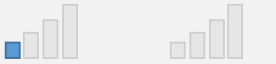
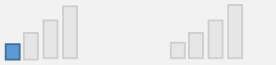
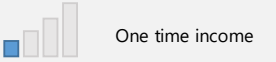
3.2.5 Airport Development Strategy Alternatives

Financial security and the ability to meet grant assurances are high priority for any airport sponsor and understanding the impacts of differing financial policies and management structures on facility development is critical to Airport management. There are a variety of land development strategies for Airport management to consider, all of which can significantly impact the course of development and carry varying degrees of responsibility, risk, and reward. These development strategies include:

1. Traditional Land Lease
2. Outright Land Sell and Full Development by Private Partner
3. Partnership: The Airport and a private developer join forces
4. Airport Control
5. Airport Control + Operations and Maintenance (O&M) Contract
6. Concession

These options are explained further in this section and are summarized and evaluated according to share of responsibility and levels of owner risk in **Figure 3-5**.

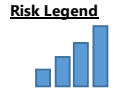
FIGURE 3-5
AIRPORT DEVELOPMENT STRATEGY ALTERNATIVES: RESPONSIBILITY, RISK, AND REWARD MATRIX

	Issue	Development Options					
		Traditional Land Lease	Outright Land Sell and Full Development by Private Developer	Partnership	Airport Control	Airport Control + O&M Contract	Concession
INVESTMENT RESPONSIBILITY	**Land**	Leased by Airport	Sold by Airport to private developer	Airport as % of partnership	Airport	Airport	Airport
	Development Infrastructure Investments	Airport / Private developer	Private developer	Airport as % of partnership	Airport	Airport	Private developer
	Investments in Environmental Issues	Airport / Private developer	Private developer	Airport as % of partnership	Airport	Airport	Private developer
	Investment in Buildings and Associated Facilities	Private developer	Private developer	Private sector as % of partnership	Airport	Airport	Private developer
	Investment Aprons and Taxiways	Airport[1]	Airport[1]	Airport as % of partnership[2]	Airport[1]	Airport[1]	Airport[1]
	Maintenance	Private sector	Private sector	Partnership	Airport	Third party responsible for O&M contract	Private sector
RISK LEVELS	**Airport Investment**						
	Airport Risk						
	Impact to Airport Finances						
	Revenue Potential		One time income				

Notes:
(1) If exclusive use. If not, investment shared by FAA and Airport.
(2) Only investment made by Airport would be counted as a percent of partnership.
(3) Airport will need to invest in land release effort and changes to Exhibit 'A' - Airport Property Inventory Map.

Source: RS&H Analysis, 2021

Risk Legend



Low High

Traditional Land Lease - *Airport leases land shovel-ready and private operator builds, operates, and maintains building facilities.*

Under this option the Airport enters into some type of arrangement in which it grants a long-term land lease to the private sector for the exploitation of a given asset provided the following conditions are met by the private party: (1) Responsibility for full funding of the required investments in the development or upgrading of the asset; (2) Operation and management of the asset; and (3) Transfer of the asset to the owner/landlord at the end of the lease period (infrastructure built under the arrangement).

Outright Land Sell and Full Development by Private Partner - *Airport sells land to private developer who is responsible for full development of property and facilities.*

This option is the least frequently employed mechanism for private sector participation in airport infrastructure development because it entails private ownership of the property and no transfer back to the Airport. Under this option the airport simply receives a one-time payment for the property occupied by the facility and no longer has access to that property. FAA action is required to release the Airport from its obligations in the event the Airport wants to sell land.

Partnership - *Airport provides land shovel-ready and other infrastructure as its share of investment in the partnership for the development of the facility. Private operator builds, operates, and maintains building facilities. Revenues and risks are shared based on percentage of contribution from each party.*

Under this option the Airport becomes a silent or active partner of the private sector in the development of airport facilities by either providing airport assets as equity into the partnership or cash investments in return for a share of the net revenues in the operation of the facility. The following approaches can be used under this option:

- Airport as a Silent Partner - Under this approach the Airport provides the land and/or facility that will be developed by the private sector as their equity contribution to the partnership. The Airport's financial contribution to the partnership is determined based on an agreed value of the land where the facility will be built or if the facility already exists based on the value of the asset. The Airport's percent ownership share of the partnership is established based on its financial contribution to the partnership. The private firm is responsible for the investments required to develop a new facility or improve and upgrade an existing facility as well as with the operation and maintenance of the facilities. Profits from the operation of the facility are divided between the private firm and the Airport based on each of the party's respective percent ownership share.

- Airport as an Active Partner - Under this approach the Airport, in addition to providing the land and/or facility that will be developed by the private sector, also invests in its development as their equity contribution to the partnership. The Airport's financial contribution to the partnership is determined based on an agreed value of the land where the facility will be built or if the facility already exists based on the value of the asset plus an agreed investment amount between the parties. Based on the value of the Airport's financial contribution the parties establish the Airport's

percent ownership share of the partnership. The private firm is responsible for the remaining investments required to develop a new facility or improve and upgrade an existing facility as well as with the operation and maintenance of the facilities. Profits from the operation of the facility are divided between the private firm and the Airport based on each of the party's respective percent ownership share.

Airport Control - *Airport develops all facilities including building and support facilities. All investments and maintenance costs of the facility are under the responsibility of the Airport.*

This approach presents the highest risk for an airport which bears the full burden of ownership and operation cost, but conversely, also receives full benefits for its success.

Airport Control + Operations and Maintenance (O&M) Contract - *Airport develops all facilities including building and support facilities and enters into a contract with third party to operate and maintain facilities.*

This is the most commonly used option for private sector participation in airport-related facility development. Activities such as shops, car parking, porters, aircraft catering, and city-airport transport have traditionally been handled by private enterprises. More recently, there have been cases in which the entire airport infrastructure (airside and landside activities) has been transferred to the private sector for management and operation. The investment commitments of the private sector, in this option, are relatively low and are largely associated with the remodeling and redesign of commercial space in the case of landside infrastructure, and with minor repairs in the case of airside infrastructure. The legal configuration or instrument through which this privatization option is implemented can take the following forms:

- Service Contract - This is an agreement whereby the private entity is awarded the right, by the airport, to exploit a particular service for a given period of time and under certain agreed conditions (quality of service, leasing and or concession fees, minor repairs and maintenance commitments, etc.) These types of contracts are used as a mechanism to decentralize management and employ qualified experts in each field of business, so as to maximize the economic potential of the airport's commercial side. More and more, airport owners perceive airports as business centers and this perspective favors embracing revenue opportunities by expanding the types of goods and services offered and making the airport operate as a business venture.

- Contracting Out - This is an arrangement in which the airport owner subcontracts the provision of a particular service with a private entity. This type of arrangement is commonly used for maintenance services. The agreements are usually simpler than those used for service concession contracts, and they are typically for shorter terms (one year or less). The use of private entities is very frequent among all sizes of airports. Contracting out has the effect of allowing the private sector to take over a function that is being provided by the airport at a given time.

- Management Contracts - Under this type of agreement the management of all, or part of, airport related activities is contracted by the airport to a specialized airport operator for a given period of time and under specified conditions (e.g., key performance metrics, economic incentives, maintenance commitments). Management contracts can take different forms in the case of airport related activities, depending on the type of services to be managed, the type of autonomy in the day-to-day administration, and the financial incentives provided to the private operator. In some cases, the management contracts can include some form of equity participation in the development of the facilities being managed. This option is used when the airport wants to maintain ownership of the asset and has committed to investment in the development, improvements, and expansion of the asset; however, the airport believes that a private operator can better manage and operate the facility with the expectation that this arrangement reduces operating expenses and increases operating revenues.

Concession - *Airport leases land and collects a percent of generated revenues with Minimum Annual Guarantee.*

Under this arrangement, the Airport charges for use of property and collects a share of revenues generated by the land and associated facilities as a concession. A contractual Minimum Annual Guarantee (MAG) is defined and in the event that the percentage of revenues collected that would be collected by the Airport do not meet the MAG, the higher MAG amount is collected. The concession agreement is commonly known in financial terms as a build-operate-transfer (BOT) approach which is widely used in infrastructure development. The following are some of the most common categories of long-term concessions arrangements with preestablished investment commitments used in the development of airport infrastructure:

- Build-Operate-Transfer (BOT) - Under this approach, a long-term concession (normally between 20 and 40 years) is given to a private firm for the exploitation of a particular airport facility. The private firm has the responsibility to finance, build, and operate the facility for a given period, after which time the property of the facility is transferred to the airport owner. The private firm does not have title of the property at any point during the concession. The private firm manages the cash flows from the operation of the facility, accounting for operational costs, capital costs, concession fees, and profits. The BOT approach allows the airport owner to benefit from private capital market funding at no cost and without project risk (i.e., construction is the responsibility of the private sector) and commercial risk (i.e., the approach also transfers operational responsibility for the facility to the private sector).

- Build-Own-Operate-Transfer (BOOT) - A similar approach to the BOT but under this approach the private firm takes property title to the facility during the construction period and transfers it back to the airport owner at the end of the concession contract with the airport (e.g., this is used in cases in which loan guarantees or collateral are required).

- Build-Own-Operate (BOO) - A similar approach to the BOT, but in this case the property is not transferred back to the Airport the end of the concession contract.

- Build-Transfer-Operate (BTO) - A approach similar to the BOT, though under this approach the Airport takes property title of the facility immediately after construction is completed but the private sector continues to operate and manage the facility until the end of the concession contract. The private firm retains all revenues generated by the facility as well as covering all related operational expenses associated with the facility until the end of the concession contract.

- Buy-Build-Operate (BBOT) - This approach is used when the Airport owns underdeveloped or deteriorated facilities which are sold by the Airport to a private firm at a bid price, providing the private firm the right to exploit the facility for a given number of years (i.e., a concession). The facilities are upgraded and/or expanded, and the property title is owned by the private sector until the end of the concession contract after which the facility is transferred back to the Airport at a nominal pre-agreed price.

- Lease-Develop-Operate (LDO) - Under this approach the Airport leases under a long-term concession an existing facility with a private firm. The private firm is required under the contract to upgrade and expand the facility and operate and maintain it for the given period, managing its cash flows and paying the Airport an agreed lease fee. The Airport holds the property rights throughout the concession period.

- Wrap-around Addition - An existing Airport owned facility is expanded by a private enterprise, which holds title only to the addition. The private enterprise operates the entire facility through a concession contract/operational contract of the Airport owned section. At the end of the contract the entire facility is transferred back at no cost to the Airport.

3.2.6 Land Lease Options and Best Practices

Land and the facilities occupying it are two of the most valuable assets to an airport. A comprehensive approach to leasing encourages transparency and consistency, properly responds to the interest of the accountable entities, and ultimately reduces ad-hoc decision-making which can lead to unintentional noncompliance. Understanding development constraints is also an important step in creating a long-term development plan. It's important to note that legally executed lease contracts are a form of land development constraint because interim uses cannot occur during the leased without a renegotiation of terms by willing participants.

The foundation for all airport lease agreements is the FAA establishment of certain 'rights' and 'privileges' granted through the leasing (contracting) process. These rights affirm three fundamental principles:

1. The airport's obligation to provide the lessee the right to use the airfield (airport) and public facilities in common with others so authorized.
2. The airport's obligation to provide the lessee the right to occupy (area through lease) as a lessee and to use certain designated premises exclusively.
3. The airport's obligation to provide the lessee the right and privilege to engage in commercial activities, offering high-quality products, services, and facilities to airport users.

The adoption of certain leasing policies can directly impact the Airport's ability to develop land or redevelop certain Airport land or facility assets. At HIB, review of available compliance documentation identified the following areas where further examination of policy is recommended to support airport development:

- Minimum Standards
- Rules and regulations
- Lease policy and equity
- Lease terms
- Lease rents

3.2.6.1 Minimum Standards / Rules and Regulations

Minimum Standards for Commercial Aeronautical Activities (minimum standards) are the set of requirements at HIB that commercial operators must meet or exceed in order to conduct business at the Airport. Airport rules and regulations set the standards for airport user conduct. These may be in the form of local ordinances, or a stand-alone document developed by the airport sponsor. Airport rules and regulations may include, but are not limited to, the following elements: general provisions, aircraft, vehicle, commercial vehicle, hangar lessee and sublessee for which the airport deems essential for the safe, efficient use and operation of the airport. The establishment of lessee facility improvements, operational, and functional standards for the provision of services at an airport helps prevent economic unjust discrimination and the granting of an exclusive right to conduct aeronautical activities at the airport, which violates federal grant obligations. It is important to note that the "right of first refusal" clause may be considered as granting an exclusive right. Consultation with legal counsel and thoughtful consideration should be given to how and when such language should be included in lease agreements.

Airport minimum standards and rules and regulations are intended to serve as the foundation for Airport management compliance policies and may be modified over time by CHAA as necessary, but lease agreements may span several decades. For this reason, it is important that lease agreements reference both minimum standards and rules and regulations policy and contain language that properly conveys that minimum standards, and rules and regulations, are subject to change (as amended by CHAA) from time to time. Should there be a conflict between the lease agreement and established policy, the most recent minimum standards and rules and regulations should then take precedence. Minimum standards are especially relevant to leasing and developing airport property because they speak to what improvements are required for a specific activity. For example, if a parcel of land is less than one acre in size and the minimum standards require five acres of land for FBO, the value of that property, and any improvements on the property, may be affected by the fact that only certain activities will be allowed on a parcel of that size.

3.2.6.2 Formal Leasing Policy

A practical approach to remaining compliant with FAA Assurances is the adoption of a thoughtful leasing policy. Range Regional Airport currently has no formal leasing policy in place. The purpose and practice of incorporating a leasing policy is to provide sound, consistent requirements through which CHAA can do the following:

- Respond to the interests of financially stable and responsible lessees

- Administer airport leased premises in accordance with the Assurances
- Ensure the airport sponsor's ability to meet its obligation to provide a stable revenue source for the airport
- Provide guidelines for airport-related business decisions

An often-used industry best management practice is developing a comprehensive airport leasing policy that applies to both land and improvement leases. To be successful, leasing policies must strike a balance between allowing flexibility for unanticipated development opportunities while remaining comprehensive enough to account for multiple lessee types and operations. A standard comprehensive leasing policy supports the equitable treatment of all airport lessees and also helps minimize questions, concerns, and potential conflicts between the airport sponsor and its lessees.

When crafting and adopting a formal leasing policy, the Airport should understand that, when not implemented properly, there is potential for limiting the flexibility to tailor leases according to present circumstances. A poorly written formal leasing policy could also potentially limit or delay the Airport's ability to customize terms for any unqualified but desirable lease applications if policies needed to be amended through a formal process. If establishing a base term length in any formal lease policy, it is beneficial to allow room for tailoring individual leases to specific levels of investment, therefore avoiding situations where smaller investors may otherwise be "locked out" of potential business ventures based on leasing policies that favor larger developments. When the leasing process is not formalized, it is also especially important to document the history of leasing decisions and considerations taken so that both current and future staff understand how decisions were made. This helps maintain continuity as Airport leadership changes and avoids a loss of important information regarding current leases and Airport-established best practices.

3.2.6.3 Lease Terms

Land leases are routinely set at between 20 to 40-year terms[2]. Industry best practice holds that aeronautical lease terms should be long enough for a tenant to fully amortize their initial investment, but not so long as to relinquish Airport control over the property. Lease terms of 20 to 30 years are common for land leases that include leased premises of greater than 1-acre and commensurate lessee investment based on the type of use (e.g., commercial, non-commercial, aeronautical, and/or non-aeronautical). Lease terms of 50 years or more are considered by FAA to be a disposal of federally obligated land and violate sponsor assurances if the proper processes for releasing land from federal obligations are not followed.

Industry best practices recommend that provisions for the extension of a land lease be included in lease agreements as well as outlines for the requirements that must be met before the lessee is allowed to extend the lease, preferably contingent upon the lessor's concurrence and approval, usually by periods of 5 to 10 years. These extensions of the lease should be considered addendums to the original lease document with all covenants and provisions of the original remaining in effect. The length of a lease and the ability to extend the lease term is an important consideration for potential lessees who will be making substantial investment in improvements that need to be amortized over many years. It is important to

[2] Land leases should always include requirements for reasonable investment to be made by the lessee. Term lengths may also be limited by local statute.

consider the useful and economic life of the improvements and the size of the lessee's investment when negotiating length of term. If an extension is being considered, then considerations should be given to the relationship between the term extension and required improvements.

An element that must be included in any lease policy is lease reversion. Lease reversion is when, at the end of the initial lease term, all improvements become the property of the airport sponsor (assuming an adequate lease term was provided for amortization of the investment). Industry best management practices for leasing and developing airport property include reversion of all improvements (financed by the lessee or otherwise), regardless of when and how the lease is terminated. Prior to executing a lease agreement, the lessee must sign a reversion clause acknowledgement statement, stating they understand that all improvements (existing and future, such as a hangar an associated facilities) will revert to the airport sponsor at the end of the lease term. At the preference of the airport, it is possible to include language requiring any/all improvements constructed on the leased premises to be removed and the premises restored to pre-lease condition at the sole cost and expense of the lessee. Therefore, the lease must be long enough for the commercial service operator to be able to amortize the investment the company makes in improvements, but not so long as to unnecessarily restrict the options available to the sponsor to develop and improve the airport in the future. The savvy airport sponsor will secure cost-based fees that will support the operational costs of the airport in a sustainable manner.

Lease transfer fees are another important element to consider including into lease terms. The purpose and practice of the lease transfer fee is to provide the Airport with an effective means to recover the business cost associated with the assignment and/or development of a new lease agreement and subsequent transactions. The lease transfer fee can also capture the change in value of an asset as the improvements transfer from one party to the next. This fee can be a flat fee or a percent of sales price.

3.2.6.4 Lease Rents

Through acceptance of federal grant funds, Airport Sponsors are obligated to meet FAA grant assurances. Grant Assurance 24 states that, "[airport sponsors] will maintain a fee and rental structure of the facilities and services at the airport which will make the airport as self-sustaining as possible under the circumstances existing at the particular airport." This is intentionally stated by FAA to lessen the need for local subsidies and to assist airports in operating in a financially self-sustaining manner over the long-term.

Applicable lease rent considerations include airside land, aeronautical improvements, and hangar rents based on comparable facilities at surrounding airports with similar attributes. In order to accurately assign a market value for land and facilities, benchmarking airports of similar size and with similar infrastructure (runway length, instrument approaches, security, and air traffic control for example), should be used in a consistent manner. The same benchmarked airports can then be tracked over time for comparative purposes. These appraisals and benchmark rates can then be used as guidelines for the Airport to determine baseline rates that can be subsequently adjusted as new information becomes available.

An airport may vary its lease rates depending upon size, function (commercial vs. non-commercial), location, and level of improvements to the land (improved vs. unimproved) and the facilities being leased.

For example, the rental price of a building or hangar may vary based on size, amenities, location, access, condition, construction, and allowable use by the airport. Likewise, an airport may want to vary land lease rates based upon factors such as the magnitude of the project, the synergistic effect the project may have on other tenants and/or future development, airside versus landside location, availability of utilities, and access (from both the airside and the landside).

Industry best practice for setting lease rents is to adjust annually and consider price changes from comparable airports (markets). Adjustments are typically based on a not-to-exceed consumer price index (CPI)[3] of 3 percent or, more commonly, a fixed rate of 2 to 3 percent. Establishing a fixed rate increase is generally easier for airport staff to administer and the predictability tends to make it more desirable to airport lessees and stakeholders. Conducting a formal market rent study to determine market rents that could be applied to all new or amended leases is an excellent way to ensure Airport lease rates are competitive in the market. Industry best practice recommends performing rent studies every 3 to 5 years.

3.2.7 Airport Management Policy Recommendations

The following are recommendations for best practices HIB management can use to support implementation of the preferred development plan.

- Develop and adopt minimum standards
- Develop and adopt rules and regulations for airport tenants and users
- Establish a formal leasing policy
- Develop a lease template and leasing guidelines/best practices for internal use
- Incorporate market rate adjustments into all new leases
- Review existing leases for necessary amendments at time of extension
- Conduct regular Market Rate Study (every 3 to 5 years)
- Conduct annual benchmarking studies to gauge airport sustainability performance

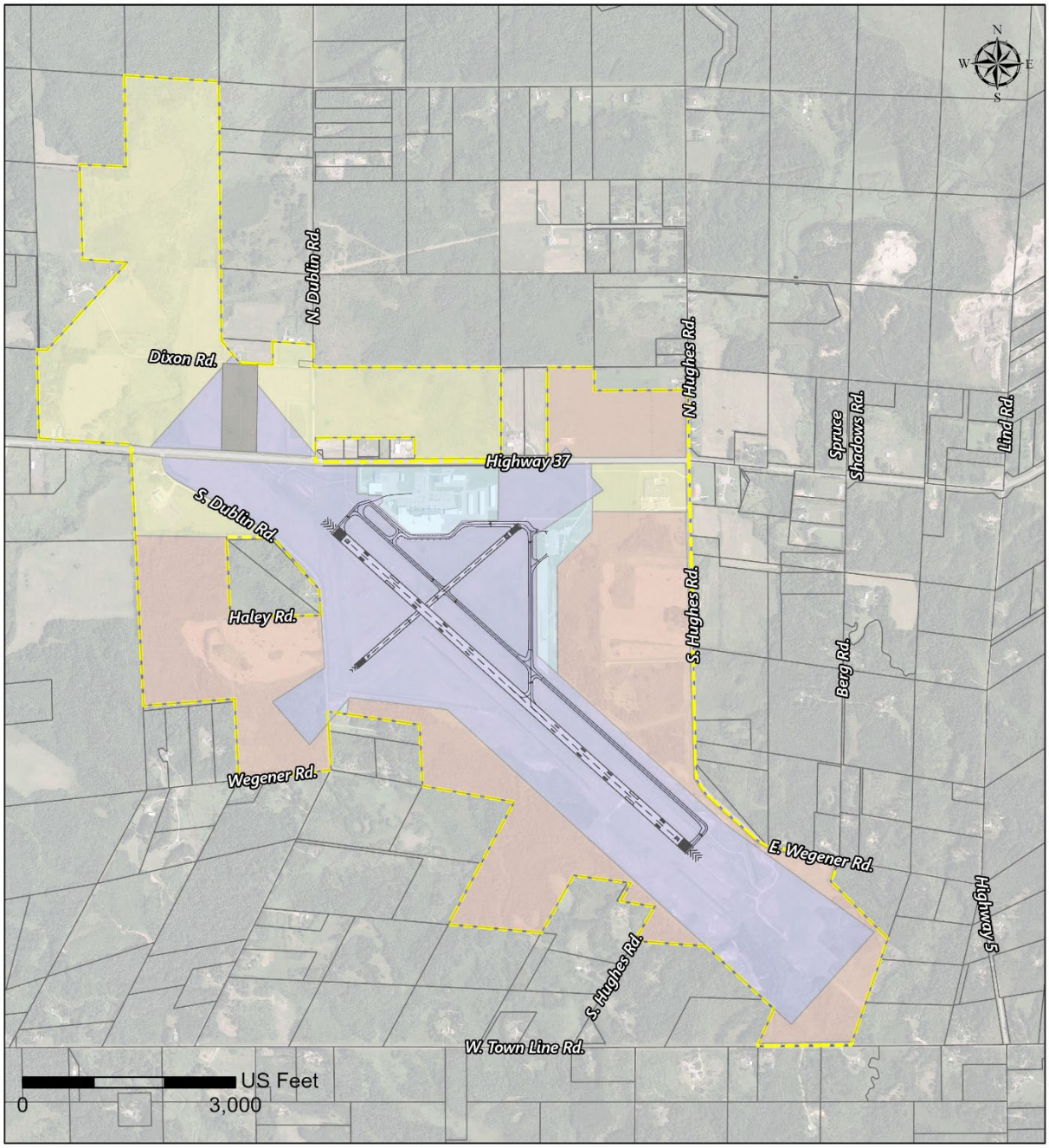
3.3 AIRPORT LAND USE

Prior to solving immediate facility needs and directing development throughout the PAL 3 planning period, it is beneficial for an airport to have an ultimate land use pattern vision in place to strive toward. This helps to guide decision making over the life of the airport, regardless of current leadership, and maintain continuity in airport growth to better serve the community and minimizes costly counter-productive development. This begins with evaluating existing land use patterns, reviewing FAA guidance on dimensional criteria (e.g., FAR Part 77, AC 150/5300-13A, etc.), and reviewing environmental conditions on and around the airport.

With Airport goals and the established vision in mind (see **Appendix C**), developing airport facilities requires an understanding of the complex relationships between programmed land use patterns allowed within the existing airport zone. **Figure 3-6** shows existing airport land uses and **Figure 3-7** shows the vision for future airport land uses based on that established Airport vision.

[3] It is important to note that CPI does not have a direct correlation to changes in the market and that CPI or fixed rate adjustments may not wholly cover the difference in appraised values.

FIGURE 3-6
AIRPORT EXISTING LAND USE PATTERN

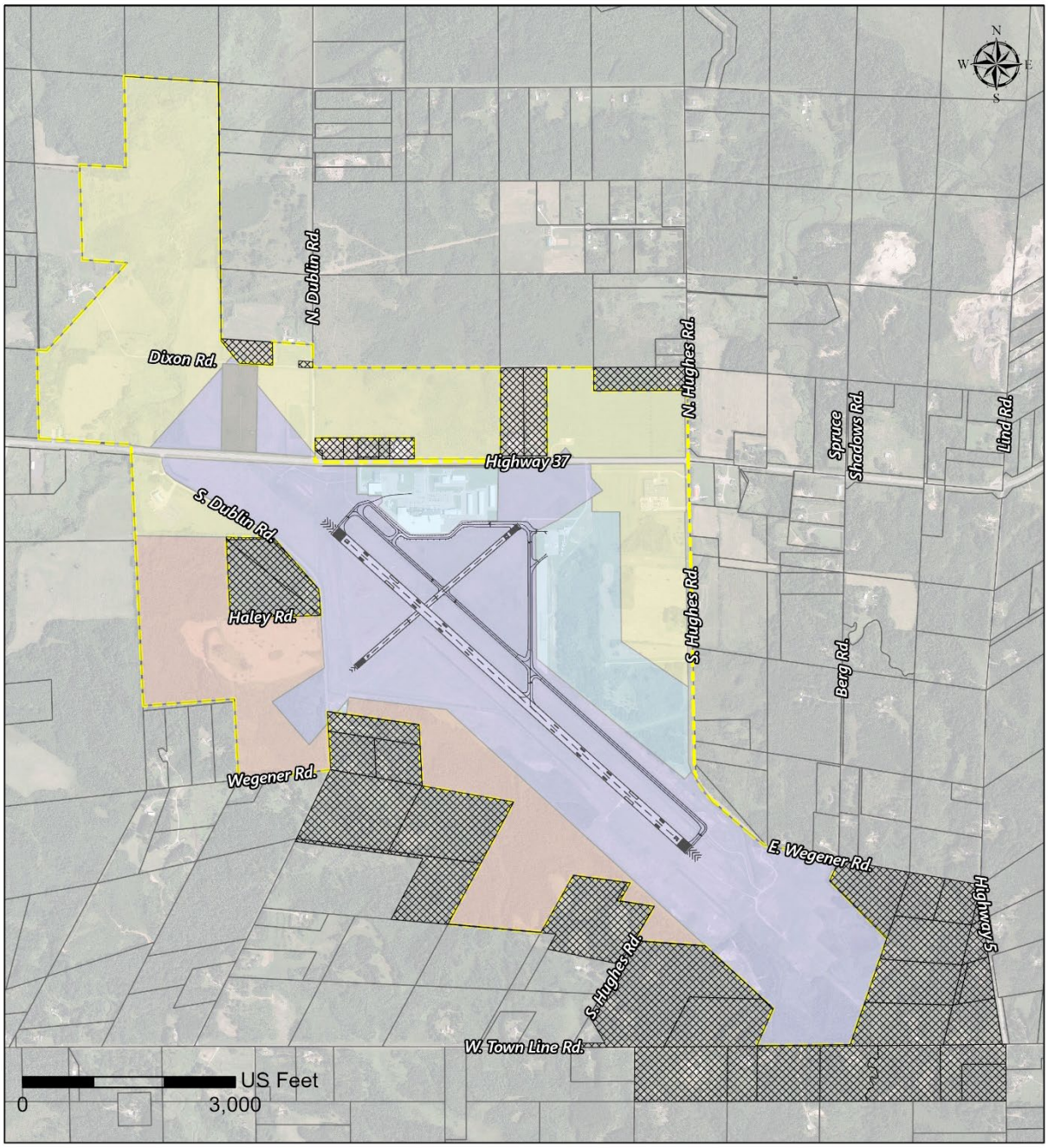


Legend

- Airport Property Line
- Airport Operations Area
- Aeronautical
- Non Aeronautical
- Preserved for Future Use
- City - Cemetary
- Parcels

Source: RS&H, 2021

FIGURE 3-7
AIRPORT PREFERRED FUTURE LAND USE PATTERN



Legend

- Airport Property Line
- Airport Operations Area
- Aeronautical
- Non Aeronautical
- Preserved for Future Use
- City - Cemetary
- Parcels
- Parcels to Acquire

Source: RS&H, 2021

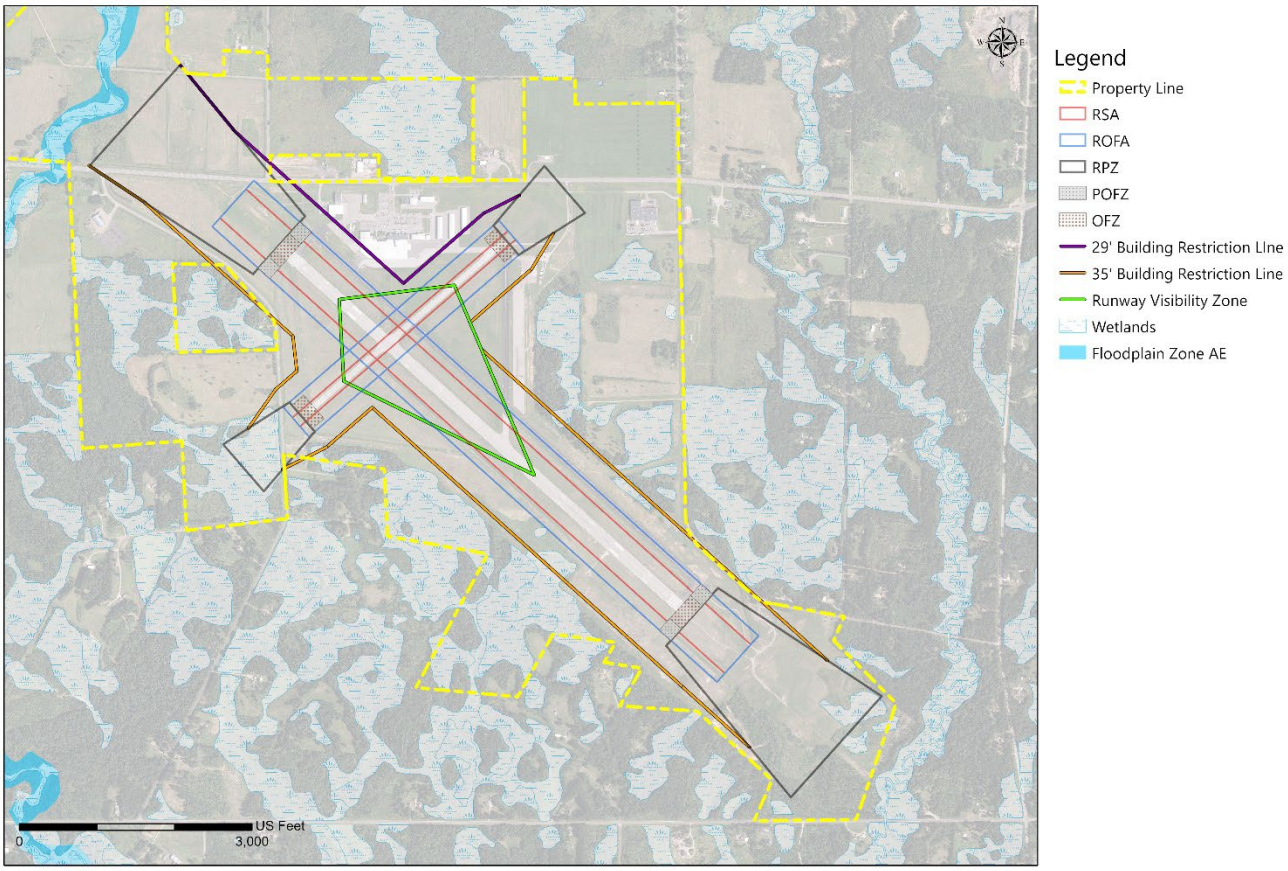
3.4 FAA AND ENVIRONMENTAL DEVELOPMENT CONSTRAINTS

Development at any airport faces prohibitions, limitations, or additional procedural requirements when it lies within an FAR Part 77 protected airspace surface or a wetland area. FAR Part 77 surfaces are defined to promote air safety and the efficient use of airspace. These imaginary surfaces limit and identify potential obstructions to air navigation.

At HIB, the most prominent FAA design guidance limits relate to the Runway Protection Zones (RPZs), the Building Restriction Lines (BRL), and the Runway Visibility Zone (RVZ), as shown in **Figure 3-8**. The BRLs show the maximum height of 29 feet and 35 feet for any vertical obstruction. It is important to consider any object height which will be present within the BRL area, even if temporary, and particularly the tails of aircraft parked near or within any protected surface areas. The RPZs at each runway end are sized based in the runway category and existing approach procedures and should be free of any development. Any potential obstruction within proximity of an airport, whether permanent or temporary, is subject to the FAA Form 7460 obstruction evaluation process. Proposed alternative concepts will take caution not to impact any protected surfaces.

Wetlands are protected by the United States Environmental Protection Agency (EPA) under the Clean Water Act of 1972 (CWA) and the National Environmental Policy Act of 1969 (NEPA). The CWA serves to protect wetlands from pollutants and adverse impacts to surface water quality. NEPA serves as a tool to inform and involve the public in any development decisions which carries significant impact to the natural environment, such as waters and wetlands. The National Wetland Inventory provides federally identified wetland information to inform the Airport of areas where additional procedural requirements, such as an environmental assessment (EA) and wetland mitigation efforts may be required. This allows a public process to take place prior to any development, which also adds time and cost to any impacted project. All projects funded by federal grants which take place in determined wetlands, as determined under jurisdiction of the US Army Corps of Engineers District Office, would require the EA process, and permits authorizing proposed development alterations under Section 404 of the CWA. All land which may have potential wetland impacts are identified in **Figure 3-8**.

FIGURE 3-8
AIRPORT DEVELOPMENT CONSTRAINTS



Source: RS&H Analysis, 2021

3.5 AIRFIELD ALTERNATIVES

Airfield alternatives for HIB focus on four aspects of improvement:

1. Meet established FAA airfield geometry and design standards
2. Meet performance requirements for current and future design aircraft
3. Address known or anticipated operational safety concerns
4. Serve areas future facility development

Facility requirements identified three areas of the airfield not meeting current FAA design standards. These include the intersection of Runway 22/Taxiway A/Taxiway B, the Runway 13-31/Taxiway B connector, and the segment of Runway 4-22 used as a Runway 13-31 exit.

The aircraft performance analysis (**Appendix B**) identified the takeoff length of Runway 13-31 as adequate to serve existing and future design aircraft, however, the landing length is inadequate to serve CRJ-901 aircraft (which operate at HIB with regularity) during winter conditions without significant payload restrictions. The analysis identifies the need for a runway length providing a landing distance available (LDA) of 7,400 feet to 8,000 feet. These Runway 13-31 extension alternatives and the resulting impacts are evaluated in the following section.

3.5.1 Runway 13-31 Extension Alternatives

An extension to the Runway 13 threshold end poses two immediately challenging constraints including the presence of a key state highway (Mn-37) and the Grandview Memorial Gardens cemetery, both of which lie in the RPZ. Any extension to this end of the runway would require a major realignment of a key state highway and an involved NEPA process relating to impacts to the cemetery. Alternatively, extension of the Runway 31 threshold end, while not without its challenges, would not require such drastic measures to achieve even the 8,000-foot runway length. For these reasons, only alternatives extending the runway on the Runway 31 threshold end have been evaluated.

Extending Runway 13-31 southeast 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 any extension between 7,400 feet and 8,000 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. The relocation of the Taxiway B connector to outside the middle third of the runway is already required to meet standards, even without any extension. 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.

Under both runway extension alternatives, the Airport would need control of land within five currently unowned parcels. RPZ protection is best achieved through purchase of the land within it, preferably in fee simple title. The degree of RPZ impacts between the two extension alternatives vary but the same five parcels are impacted regardless. It is possible that these parcels could be subdivided and only land within the RPZ be purchased, more so as it relates to a 7,400-foot extension, however, if possible, it is

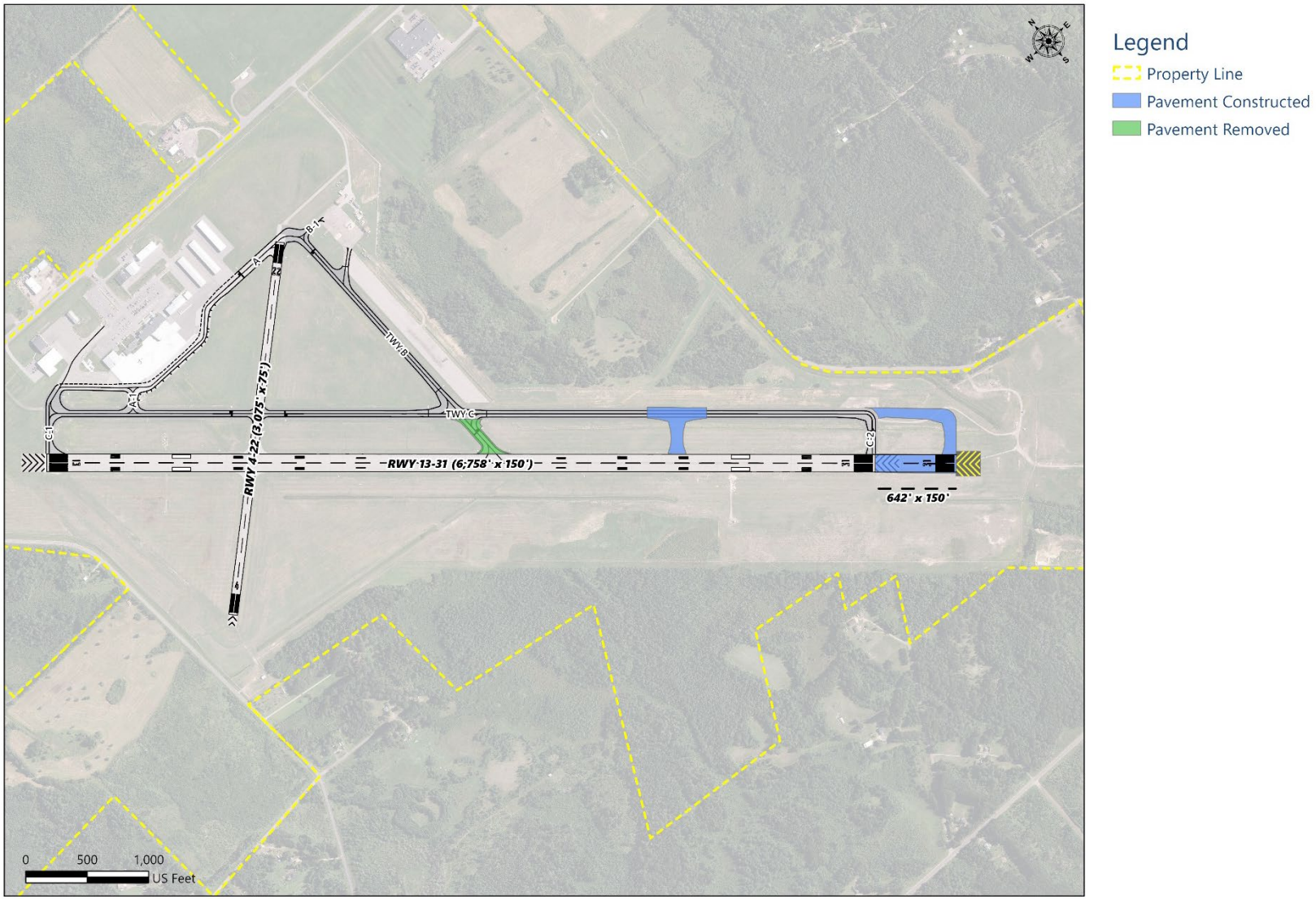
recommended at this time that the entire parcels be purchased outright. Additionally, purchasing land within the immediate proximity of the airfield and RPZ is generally a good practice to alleviate potential land use conflicts and "bank" the land for future Airport purposes.

Each of the runway extension alternatives has a 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 extension to 8,000 feet places Town Line Road further into the south corner of the associated new RPZ. Because there is some degree of impact to a new RPZ, an additional study may need to be performed to determine if safe conditions could be maintained within that portion of the RPZ of if Town Line Road would need to be altered to mitigate the new RPZ impacts.

Figure 3-9 and **Figure 3-10** show future conditions for the 7,400-foot runway extension.

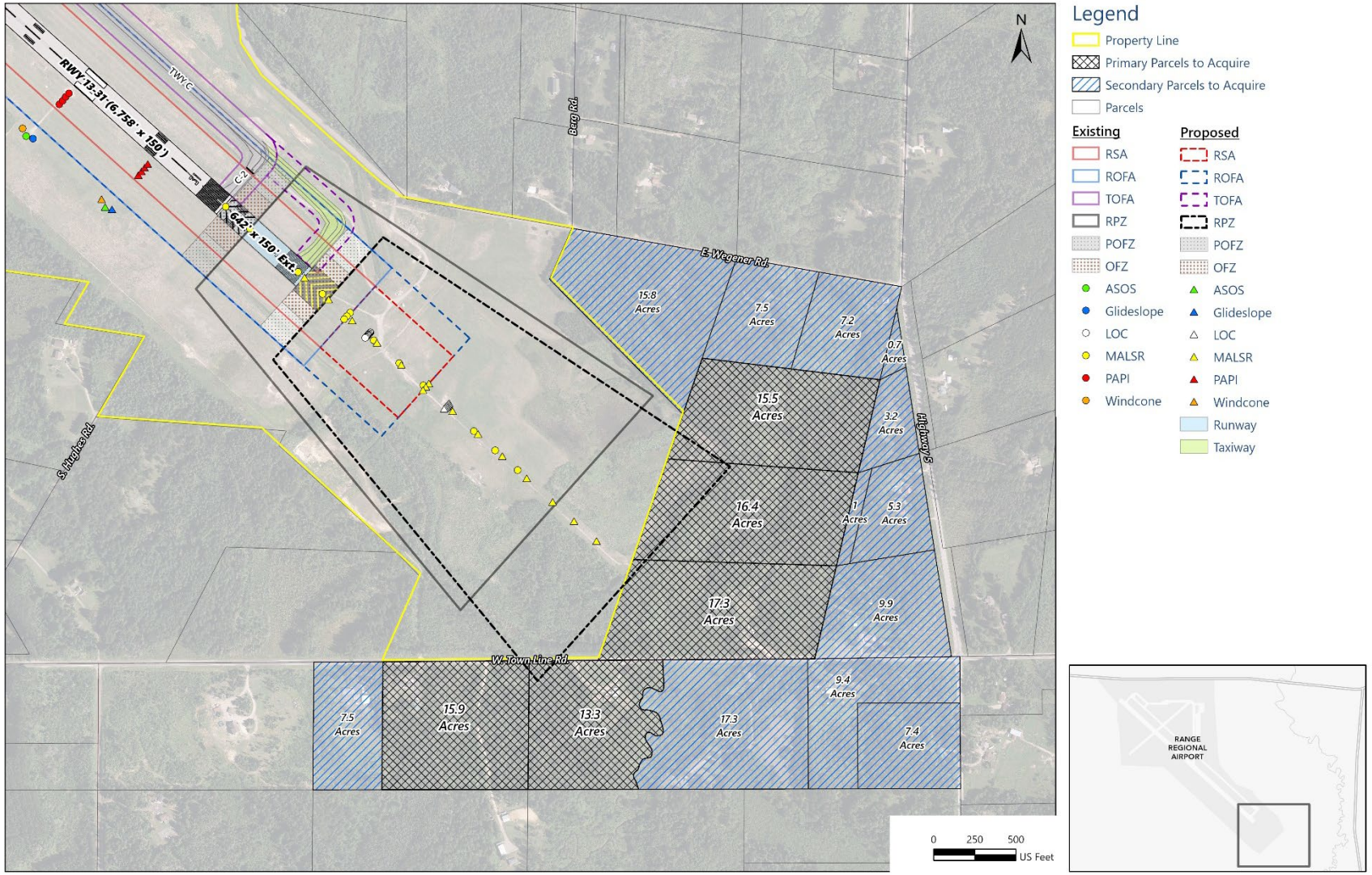
Figure 3-11 and **Figure 3-12** show future conditions for the 8,000-foot runway extension.

FIGURE 3-9
RUNWAY 13-31 AT 7,400' WITH RELOCATED RUNWAY EXIT



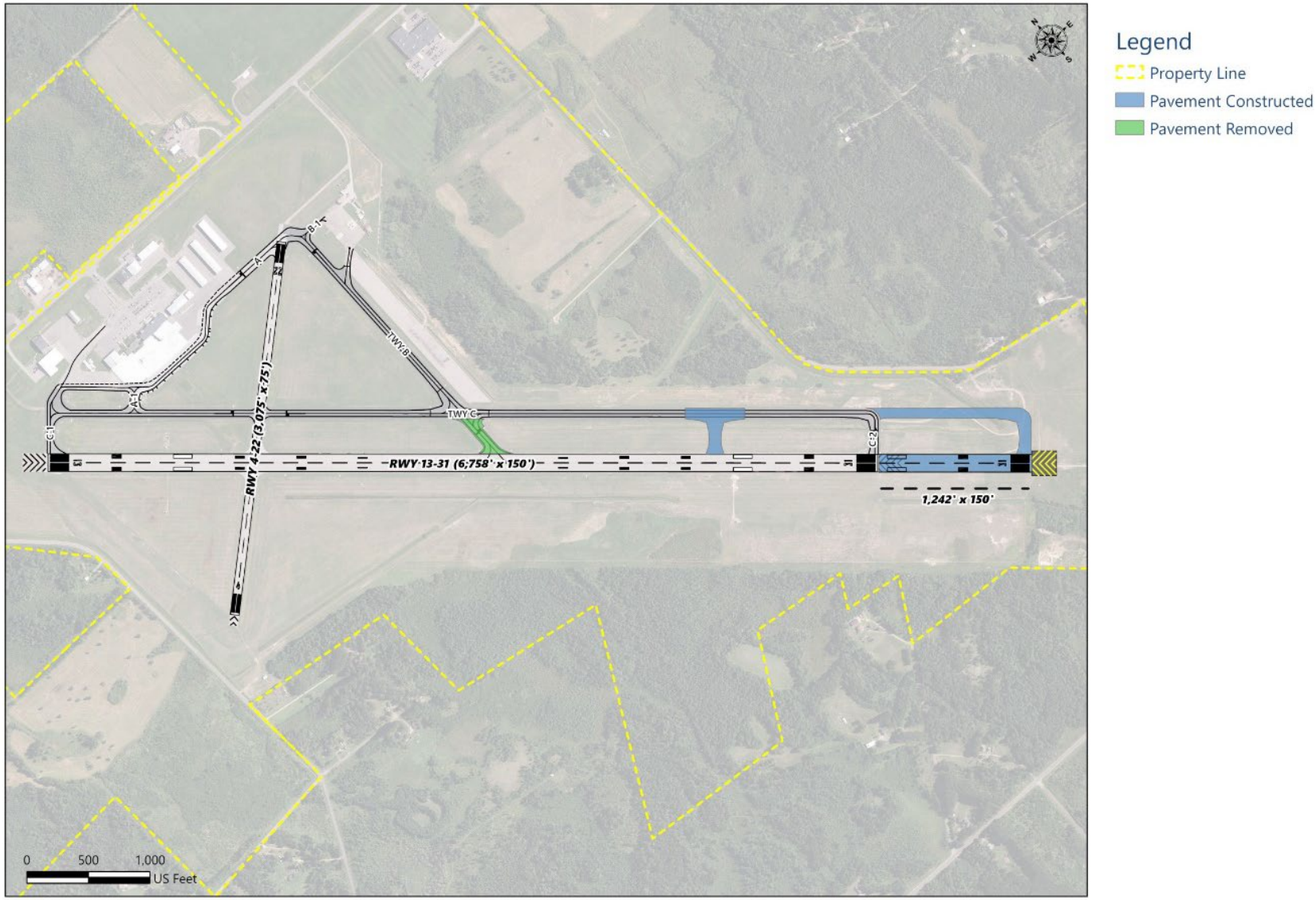
Source: RS&H Analysis, 2021

FIGURE 3-10
7,400' SOUTH RUNWAY EXTENSION



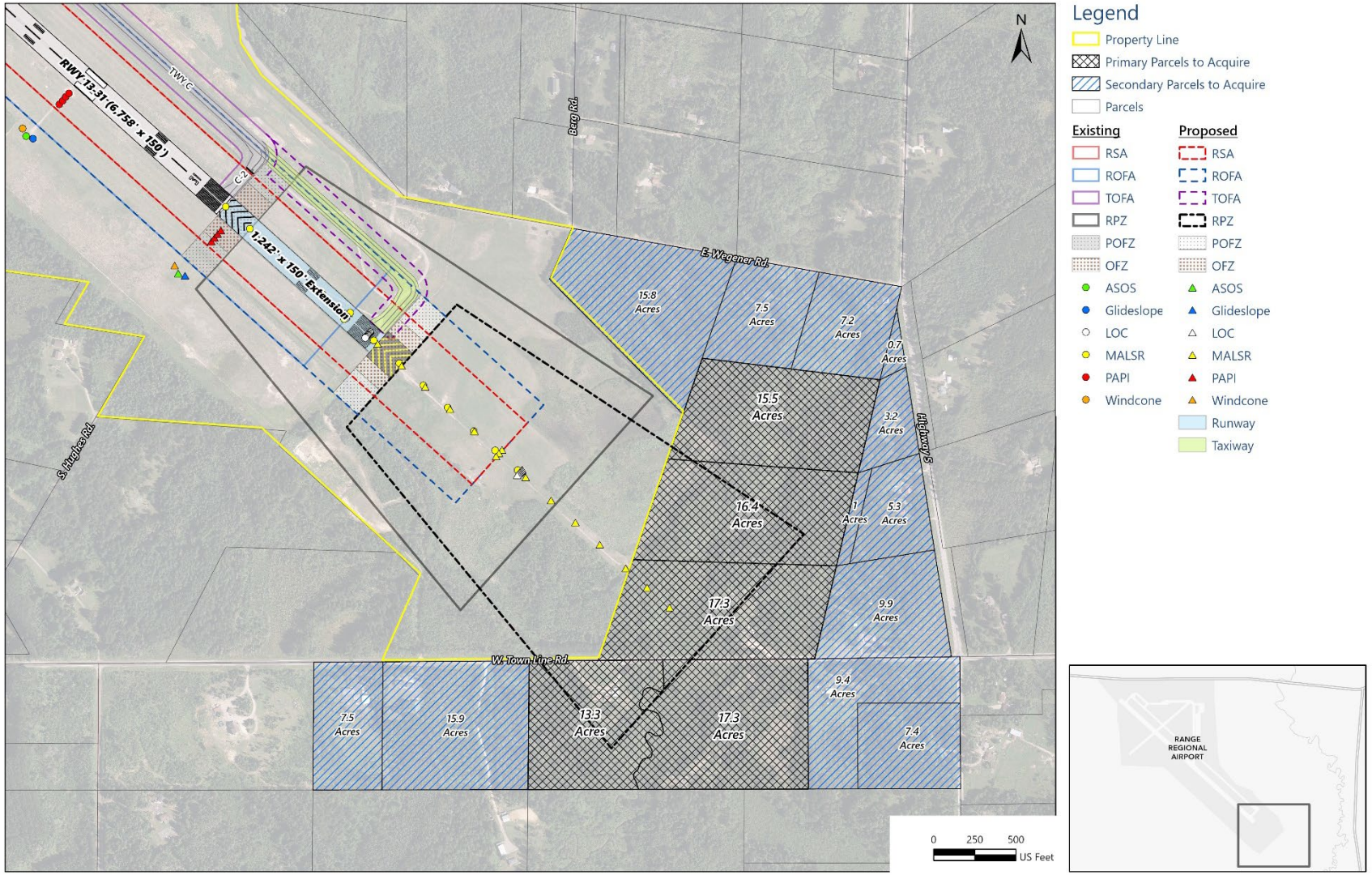
Source: RS&H Analysis, 2021

FIGURE 3-11
RUNWAY 13-31 AT 8,000' WITH RELOCATED RUNWAY EXIT



Source: RS&H Analysis, 2021

FIGURE 3-12
8,000' SOUTH RUNWAY EXTENSION



Source: RS&H Analysis, 2021

3.5.2 Runway 13-31 Extension Alternatives Evaluation

An evaluation of the two Runway 13-31 extension alternatives and the existing (No Action) condition is provided below and shown in **Table 3-8**.

- **Safety:** The safety of the runway and its users improves with length, especially during periods of inclement weather.

- **Operational Efficiency:** Extending the runway to a total LDA between 7,400' and 8,000' would improve the Airport's operational efficiency by meeting operating aircraft performance demands and limiting air carrier delays, diversions, or cancelations.

- **Meets FAA Design Standards:** FAA design standards can be met when providing a total LDA of between 7,400' and 8,000'.

- **Effectively Serves Target User:** Currently, the runway effectively serves the commercial aircraft using during dry conditions, however, if the runway were extended it would meet dispatch performance requirements for CRJ-701 and CRJ-901 aircraft. One additional benefit of extending the runway is that added LDA could ultimately attract increased commercial air service by new or existing operators with more diverse fleets and currently unserved markets.

- **Resolves Current Issues:** In its current state, the runway does not provide the performance safety margins needed by operators of CRJ-701 and CRJ-901 aircraft during contaminated runway conditions (RCC 3). Extending the runway length LDA to 7,400' or 8,000' resolves this issue.

- **Meets Long-Term Facility Needs:** Extending the runway would meet forecast near-term and long-term facility needs.

- **Appropriate Level of Service**: Passenger level of service is improved by extending the runway in both of the alternatives because it effectively reduces air carrier delays, diversions, or cancelations. Keeping the runway at its existing length maintains the Airport's existing level of service by maintaining the existing issues with service reliability as well as limiting the potential for increasing the commercial service fleet and markets available to the community.

- **Ease of Implementation:** Both runway alternatives can be implemented with generally the same degree of minimal operational impacts.

- **Cost of Implementation:** Implementation costs for any runway extension is manageable when funded through available federal, state, and local financially supportive agencies. Associated costs a runway extension include advanced planning studies, the NEPA process, land acquisition (for the extended RSA, ROFA, and RPZ), design, and construction.

- **Flexible for Future Expansion:** A runway extension between 7,400′ and 8,000′ maintains flexibility for future expansion of the airfield and runway without causing additional conflicts to previously developed land and roadways to the north.

- **EONS Impact:** Impacts to EONS categories vary by each alternative. No action jeopardizes economic viability, operational efficiency, and community social responsibility factors. Extending the runway has the impact of changing the natural environment and potentially displacing property owners south of the runway end.

- **Support Sustainable Development Principles:** It is the Airport's responsibility to support aeronautical activities in the region. Restricting the availability of air transportation access by limiting runway length needed for safe landing operations limits the communities overall economic opportunities.

3.5.3 Runway 13-31 Extension Alternatives Summary

Evaluating the existing and alternative runway lengths against established criteria clearly demonstrates the benefits an extending Runway 13-31 by a minimum of 642′ in the near-term. Extending the runway by 1,242′ to a length of 8,000′ offers further long-term benefits at higher implementation cost. It is recommended that HIB plan to extend the runway to 7,400′ within the near- to mid-term of the planning period and begin planning for an ultimate runway length of 8,000′. **Table 3-8** shows an evaluation of the runway extension alternatives.

TABLE 3-8
RUNWAY 13-31 ALTERNATIVES EVALUATION MATRIX

Evaluation Criteria	Runway Extension Alternatives		
	Existing (No Action)	Alternative 1 (642' Ext.)	Alternative 2 (1,243' Ext.)
Safety	Good	Good	Good
Operational Efficiency	Fair	Good	Good
Meets FAA Design Standards	Fair	Good	Good
Effectively Serves Target User	Fair	Good	Good
Resolves Current Issues	Poor	Good	Good
Meets Long-Term Facility Needs	Poor	Good	Good
Appropriate Level of Service	Poor	Good	Good
Ease of Implementation	Good	Good	Good
Cost to Implement	Good	Fair	Fair
Flexible/Future Expansion	Good	Good	Good
EONS Impact	Fair	Fair	Fair
Supports Sustainable Development Principles	Fair	Good	Good

Performance Legend

Good	
Fair	
Poor	

Source: RS&H, 2021

3.5.4 Additional Airfield Considerations

There are additional airfield requirements that can only be determined once a comprehensive development plan addressing leading planning factors is established. The following items will be included in the preferred development plan and implied if not explicitly represented on the graphic.

- Taxiways/taxilanes
  - Eliminate use of Runway 4-22 as taxiway
  - Construct 20-foot paved shoulders for Taxiway A and B-1
  - Correct designations of Taxiway B and Taxiway C-2 to make them sequential
- NAVAIDS, signage, and pavement markings/lighting
  - Plan for runway extension NAVAID impacts
  - Taxiway B lighting for commercial operations
  - Runway 4-22 signage lighting
  - ASOS backup generator
  - Segmented circle

3.6 TERMINAL AREA ALTERNATIVES

The commercial terminal building and other terminal area facility alternatives are based on the three growth scenarios identified within **Chapter 2, Inventory and Facility Requirements**. These include the Baseline, High Growth, and Ultra Low-Cost Carrier (ULCC) scenarios.

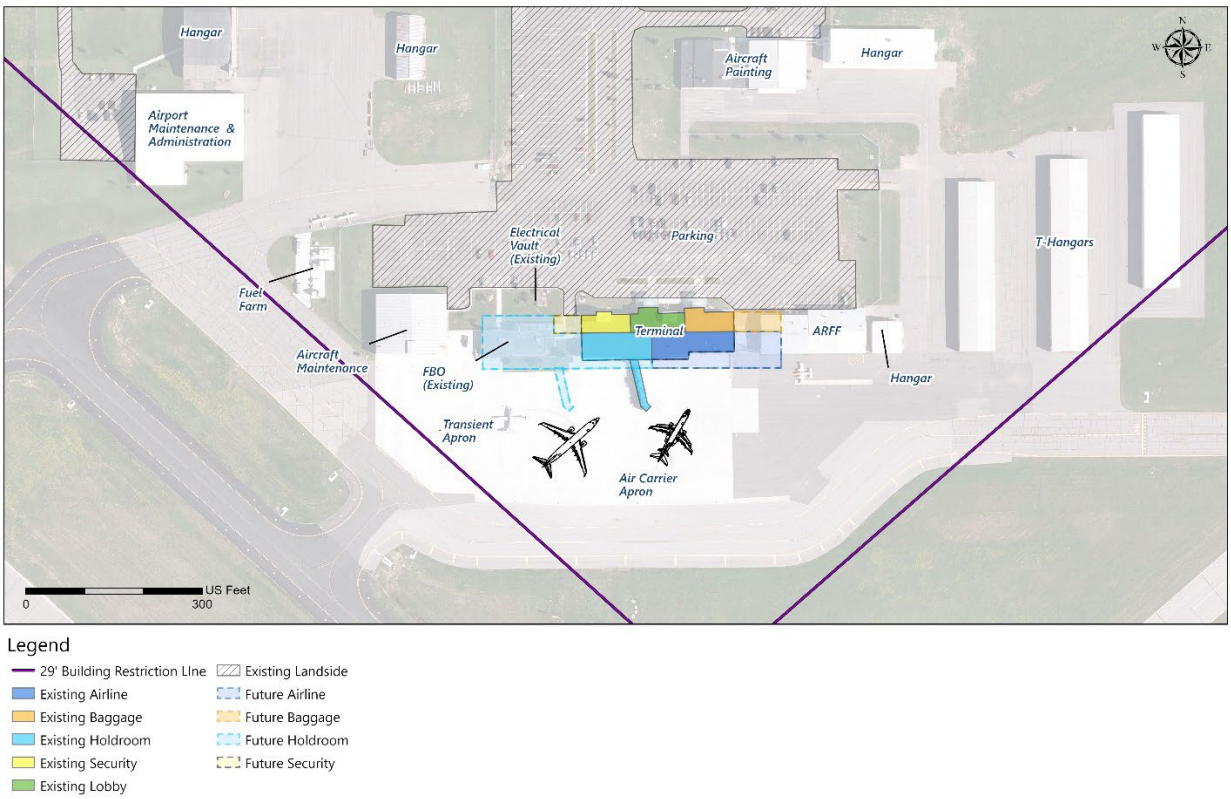
Terminal area airfield alternatives will be evaluated to address capacity constraints and safety concerns in, and around, the Secure Identification Display Area (SIDA) and air carrier apron. Alternatives will also address deicing operations for commercial aircraft. All additional facility requirements related to the airfield and airport operational safety will be included within a comprehensive preferred airport development plan.

3.6.1 Terminal Building Expansion Area

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 slightly overbuilt in anticipation of future expansion projects. For the purposes of planning for this 20-year period, needs for the ULCC scenario and impacts on adjacent facilities will be considered as the proper amount of space to plan for expansion.

The existing terminal is well designed to accommodate expansion. **Figure 3-13** shows a diagram of the area which primary terminal functional spaces would require under the ULCC scenario. The diagram also shows the proposed location for a new gate and boarding bridge, as well as adjacent impacted facilities. The facility most immediately impacted by the expansion is the existing FBO. Expansion at this magnitude requires relocation of the existing FBO and the nearby electrical vault.

FIGURE 3-13
TERMINAL EXPANSION AREA



Source: RS&H Analysis, 2021

3.6.2 Landside Expansion Area

Area to expand terminal landside facilities at HIB is extremely limited. Analysis estimates that if no further development occurs within the immediate terminal area adjacent to parking facilities, there may be enough space to accommodate Baseline and High Growth demand levels.

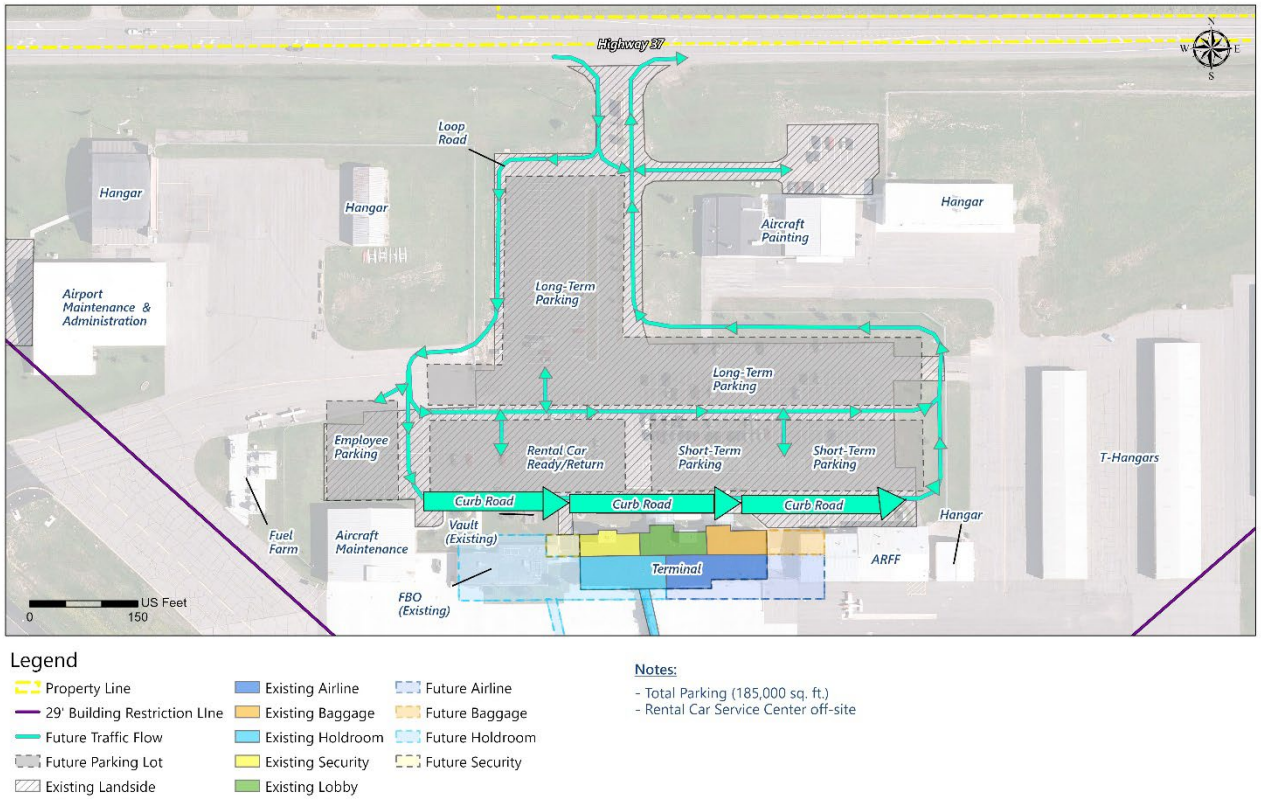
As the airport grows, a simple entry-exit driveway from the regional access road (Mn-37) is less effective at safely and efficiently circulating vehicle traffic volumes during peak times. Roadway level of service conditions begin to deteriorate, warranting investment in infrastructure solutions. For the purposes of this study, landside alternatives will consider the following landside objectives and planning principles:

- Provide a common approach experience to all landside destinations
- Provide facilities designed to meet domestic "driver expectations" such as
  - Terminal destinations on the right
  - Parking and rental car destinations on the left
  - Intuitive wayfinding with visual cues for driver confirmation
- Create binary choices at all decision points
- Design for safe decision and maneuvering distances between sequential decision points
- Avoid unnecessary bypass traffic on terminal curb road
- Place highest value landside functions closest to the terminal

- Minimize walking distances for most passengers/customers
- Eliminate pedestrian and auto conflicts on curb roads
- Tailor terminal and landside interface for safety and desired level of service
- Provide a simple range of public parking options to create highest level of service and maximize overall net revenue
- Avoid creating a need to shuttle parking customers, or if necessary, minimize shuttle circulation distance, time, and cost
- If possible, place service vehicle traffic on independent roadways

Figure 3-14 shows an alternative for the Baseline and High Growth scenarios that allows the creation of a small airport terminal loop road. While possible, a landside loop road is not fully necessary for the existing level of landside traffic. However, as demand approaches ULCC scenario levels, a loop road should be considered as an appropriate investment to ensure safe and efficient landside operations. Under this landside alternative, designated short-term surface parking is placed closest to the terminal baggage area on the east side of the parking lot. Rental car ready-return spaces are located closest to the terminal on the west side of the parking lot. Employee parking is located outside of the terminal loop on the far west side of the parking area. The remaining spaces are designated for long-term surface parking. A bypass access roadway runs between the programmed parking areas to provide access and eliminate the need for these vehicles to use the curb road, thereby improving its lifespan and capacity. A parking garage was not considered as a practical alternative at this time because high-level cost-benefit analysis showed the cost to build, manage, and maintain it could not yet be supported through the implementation of parking fees. At the time the Airport is considering establishing a landside "loop road" system, advanced landside planning should be done to determine the proper parking program specific to known demand levels. Parking programs shown in these alternatives are high-level approximations and may not best reflect space allocations to meet future demand needs.

FIGURE 3-14
LANDSIDE BASELINE AND HIGH GROWTH ALTERNATIVE

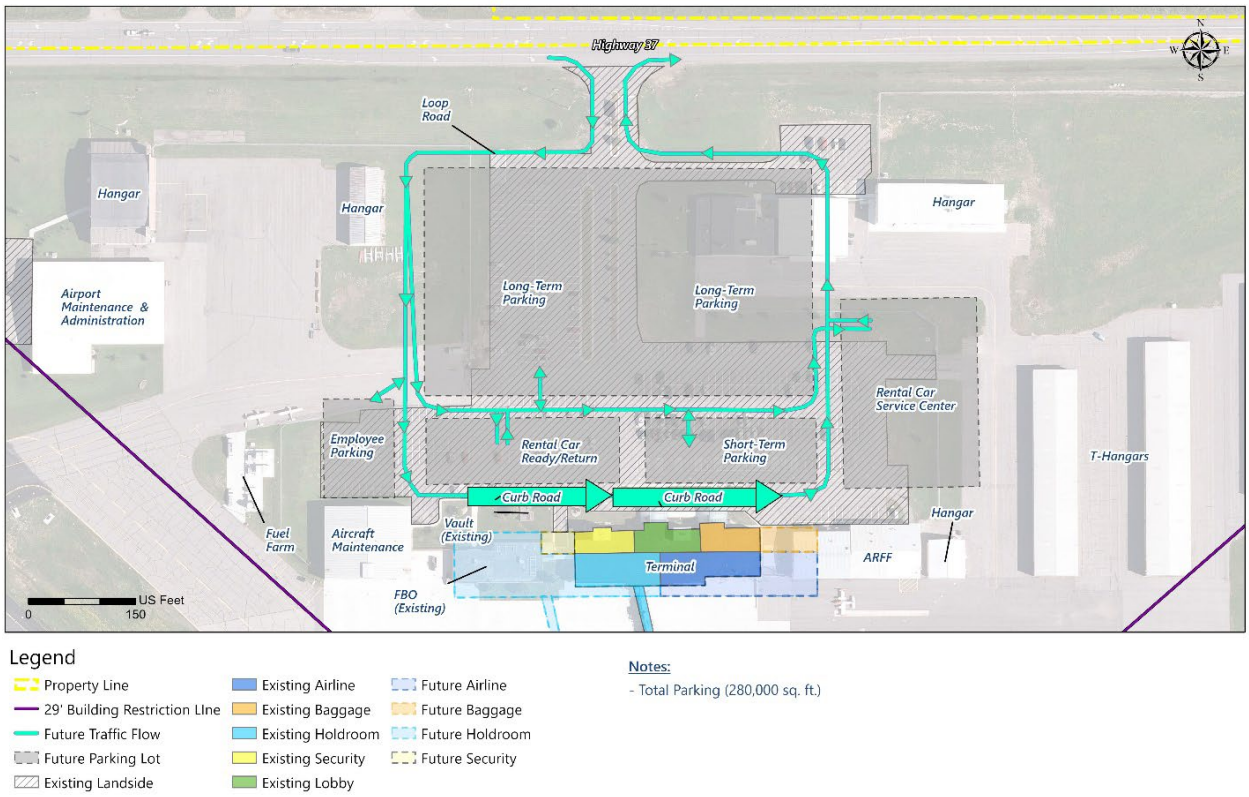


Source: RS&H Analysis, 2021

The land area required for landside facilities that support demand under the ULCC scenario was evaluated in the alternative shown in **Figure 3-15**. This alternative expands the loop road and parking area shown in the Baseline and High Growth scenario, which directly impacts multiple existing general aviation facilities that flank the terminal/landside area. The addition of a potential space for rental car servicing (washing, fueling, maintenance and storage is shown exterior to the loop road on the east side. Alternatively, this area could be located off-site to provide additional room for passenger parking, however, rental car agencies typically prefer nearby locations with limited required shuttling on public roadways to reduce operating costs and liability, as well as improving the ability to provide a customer level of service.

Knowing that landside facility space is highly constrained, critical to meeting terminal customer demand, and landside expansion has direct impacts on existing general aviation facilities, this Master Plan establishes a plan for the eventual relocation of general aviation facilities impacted by future landside expansion. By doing so, as general aviation facilities age, amortize, and inevitable reach the end of their useful life, adequate replacement options will already be available for impacted tenants needing to relocate.

FIGURE 3-15
LANDSIDE ULCC GROWTH ALTERNATIVE



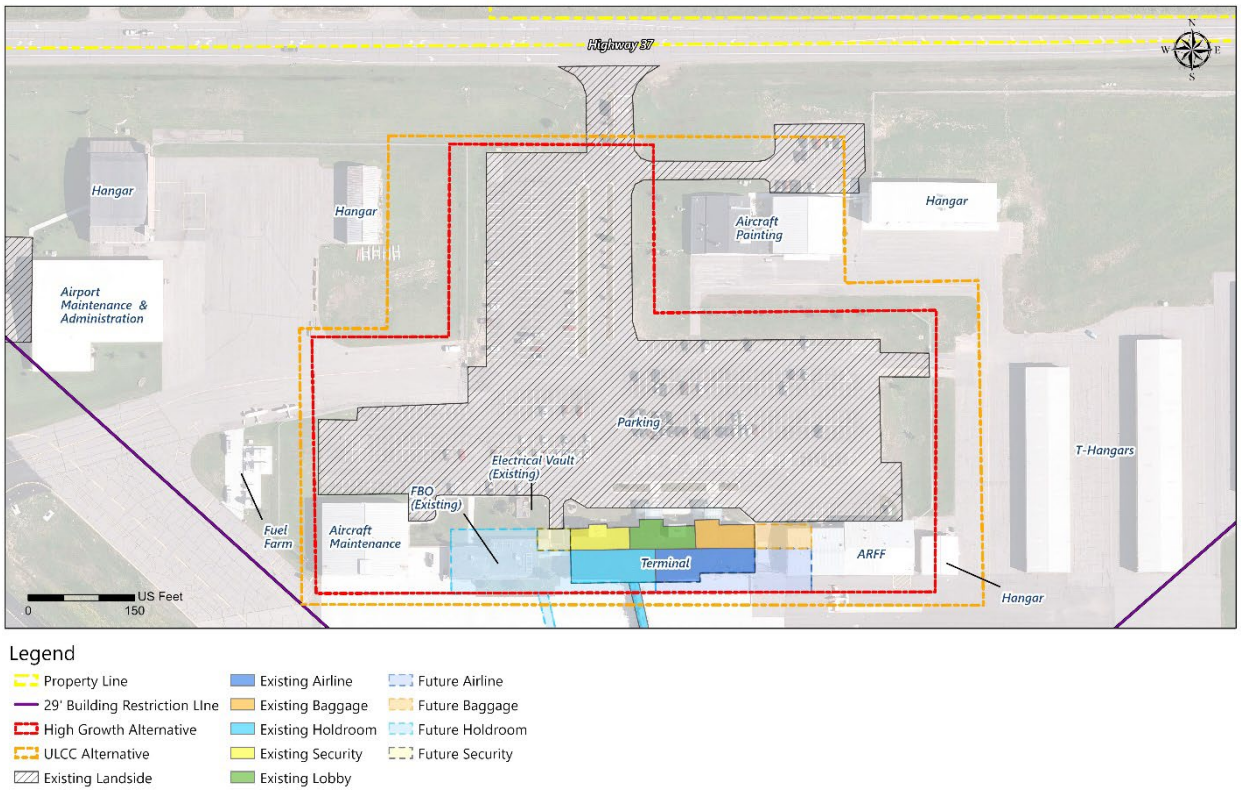
Source: RS&H Analysis, 2021

3.6.3 Terminal Area Expansion Impacted Facilities

The current terminal building was planned and designed for future expansion to the east and west. This flexibility enables each designated area of the terminal to grow outward, retaining the same functional uses to prevent any operational gap during and after construction as well as maximizing the Airport's value for the incurred project cost. With this pattern of growth, multiple facilities that are not a part of the terminal will also be impacted. **Figure 3-16** shows the facilities impacted by the terminal expansion area.

Primary facilities are impacted by the future expanded terminal area footprint regardless of which forecast scenario occurs. Critical impacted facilities include the FBO and transient apron, an aircraft maintenance facility, ARFF facilities, and the electrical vault. The facilities identified as secondary impacted facilities, are those that are only affected by the terminal area footprint of the ULCC scenario landside alternative. These secondary facilities include the aircraft painting hangars, the westernmost T-hangar building, and a small conventional hangar on the east side of the air carrier apron. As terminal area expansion planning begins, it is essential that new replacement primary facilities be constructed in a new preferred location that fits into the preferred facility layout strategy. These enabling projects will ensure that each facility and its operators are able to transition to a new facility without a serious disruption to operations as terminal area projects begin.

FIGURE 3-16
TERMINAL AREA EXPANSION IMPACTED FACILITIES



Source: RS&H Analysis, 2021

3.6.4 Terminal Area Airfield Facilities

This section focuses on the requirements and issues of the airfield pavement surrounding, or in the immediate vicinity of, the Airport's terminal and core.

Taxiway A and Taxilane A surround southern edge of the aprons and taxilanes with access to the Airport's terminal, FBO, ARFF, and GA facilities. Taxiway/Taxilane A is connected to the rest of the airfield by Taxiway Connector C-1 to the northwest, Taxiway Connector A-1 to the west, and Taxiway B to the east. Due to the limited available connectors and the majority of Airport aeronautical facilities being located near the terminal, there are many instances where GA aircraft taxiing east and west along Taxilane A are forced to pass by the air carrier apron, the transient apron, and any aircraft or ground support equipment parked in the terminal area. The Airport has already experienced near-miss incidents between GA aircraft and commercial operations in the terminal area which makes improving safety in this area a priority.

The intersection of Taxiway A, Runway 22, Taxiway B and Taxiway B-1 is also non-standard. In its current orientation, taxiing aircraft are forced to cross over the Runway 22 blast pad. Additionally, because the terminal area apron and the adjacent aprons' access is limited to a few taxiway connectors, the intersection of Runway 4-22 with Runway 13-31 poses a safety risk where aircraft taxiing to/from Taxiway C to Runway 13-31 may inadvertently use Runway 4-22 as a connector taxiway.

The air carrier apron meets the spatial requirements necessary to park a single Bombardier CRJ200 or Embraer E-175 aircraft. However, when a second commercial aircraft is parked on the air carrier apron it encroaches upon the GA transient apron requiring an expanded security identification display area (SIDA) along with it. The enlarged SIDA can then potentially be compromised if there are any transient aircraft already parked there. Even though these occurrences do not occur regularly, they could easily happen during a diversion, or when a Boeing 737-800 charter is parked there. In the interest of public safety and Airport security, it is recommended that the air carrier apron and SIDA both expand in size by 1,800-2,300 sq. yds. before a second commercial aircraft is parked there consistently.

Because the FBO facilities do not have any hangars for transient aircraft, short-term parking for GA aircraft is limited to the transient apron or one of seven tie-down spaces surrounding the fuel farm. Given the peak periods of activity by GA aircraft on the transient apron, the facility requirements indicate that the apron is currently deficient in space by 5,000 sq. yds. and is anticipated to be deficient by 8,300 sq. yds. by the end of the 20-year planning horizon.

The deicing of aircraft also occurs on the air carrier and transient aprons. Commercial aircraft are deiced at the gate and during pushback depending on the ability of the deicing truck to reach the front of the aircraft. Generally, the deicing of GA aircraft occurs where they are parked on the transient apron. Because both of these aprons are relatively small, any additional maneuvering by aircraft or deicing trucks could pose a safety concern to bypassing GA aircraft taxiing along Taxilane/Taxiway A to/from the T-hangar facilities.

Given these non-standard designs, deficiencies, and safety risks, each of the following alternatives will include airfield pavement changes to correct them.

3.6.5 Terminal Area Airfield and Deicing Alternatives

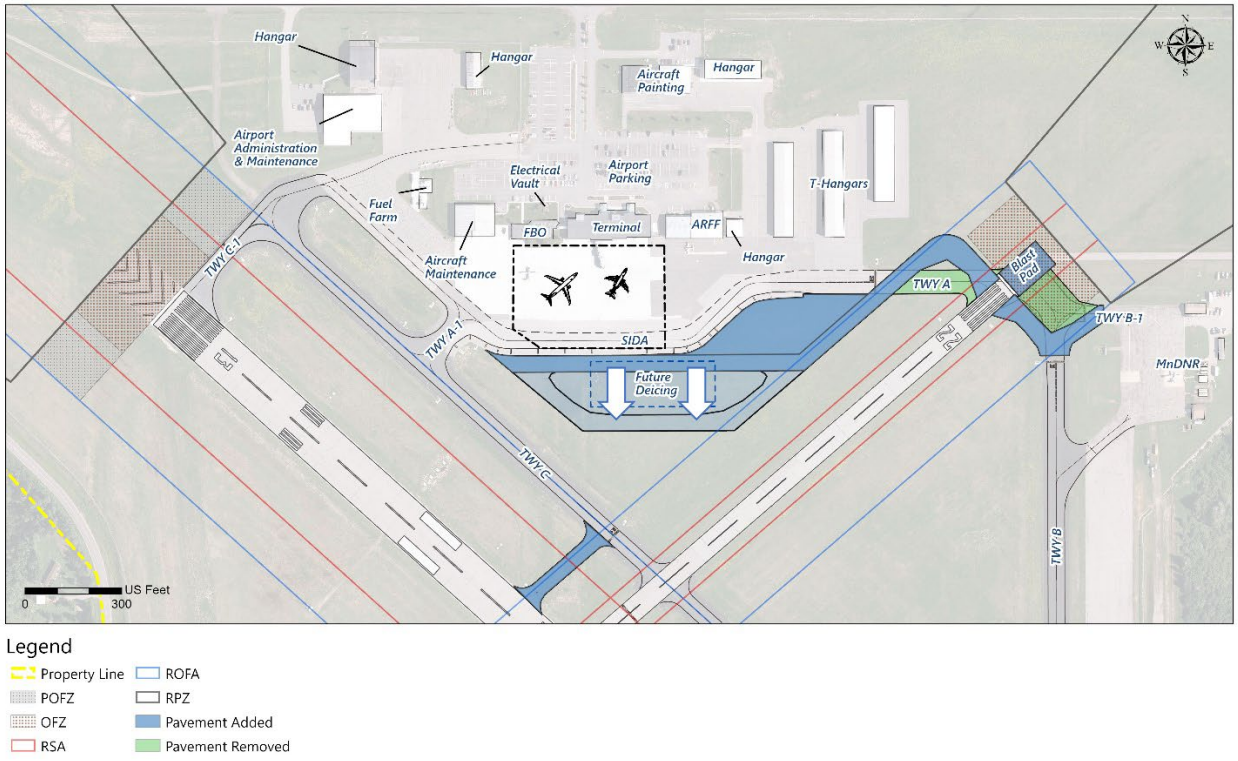
This section describes three terminal area airfield alternatives to address existing and forecast deficiencies.

3.6.5.1 Terminal Area Airfield Alternative One

Alternative one improves the overall safety and efficiency of the terminal area through design enhancements. The alternative increases the space of the apron areas by shifting the southern and eastern segments of Taxilane A farther from the terminal and converting the exiting taxilane to apron pavement. The extension of the eastern segment of Taxilane A also enables a significant amount of pavement to be added in unpaved space between the new Taxiway and the existing apron pavement. This new apron and taxilane configuration can improve safety by reducing the number of turns by taxiing aircraft and creating a greater buffer between general aviation aircraft and commercial aircraft operations. Ultimately, the apron could expand even farther to the south creating an ideal location for a designated deicing pad to be constructed. The designated deicing pad could be multi-functional and also provide the necessary space needed for diversion parking, remain-over-night (RON) or long-term commercial aircraft parking, and staged fuel or deicing trucks. Taxiway A would be realigned and reconstructed so aircraft are able to make a 90-degree turn on both sides of the end of Runway 22. This would enable the blast pad design to be bought up to FAA standards in the process. On the southeast side of Runway 22, the realigned 90-

degree intersection would help eliminate the expansive pavement at the intersection of Taxiway B, Taxiway B-1, and Runway 4-22. The reconstructed intersection would increase user safety. Finally, a new connector taxiway could be located north of the two runway's intersection to provide a proper runway exit that reduce the chances of aircraft taxiing on the short segment of Runway 4-22 between Runway 13-31 and Taxiway C. **Figure 3-17** shows terminal area airfield alternative one.

FIGURE 3-17
TERMINAL AREA AIRFIELD ALTERNATIVE ONE



Source: RS&H Analysis, 2021

3.6.5.2 Terminal Area Airfield Alternative Two

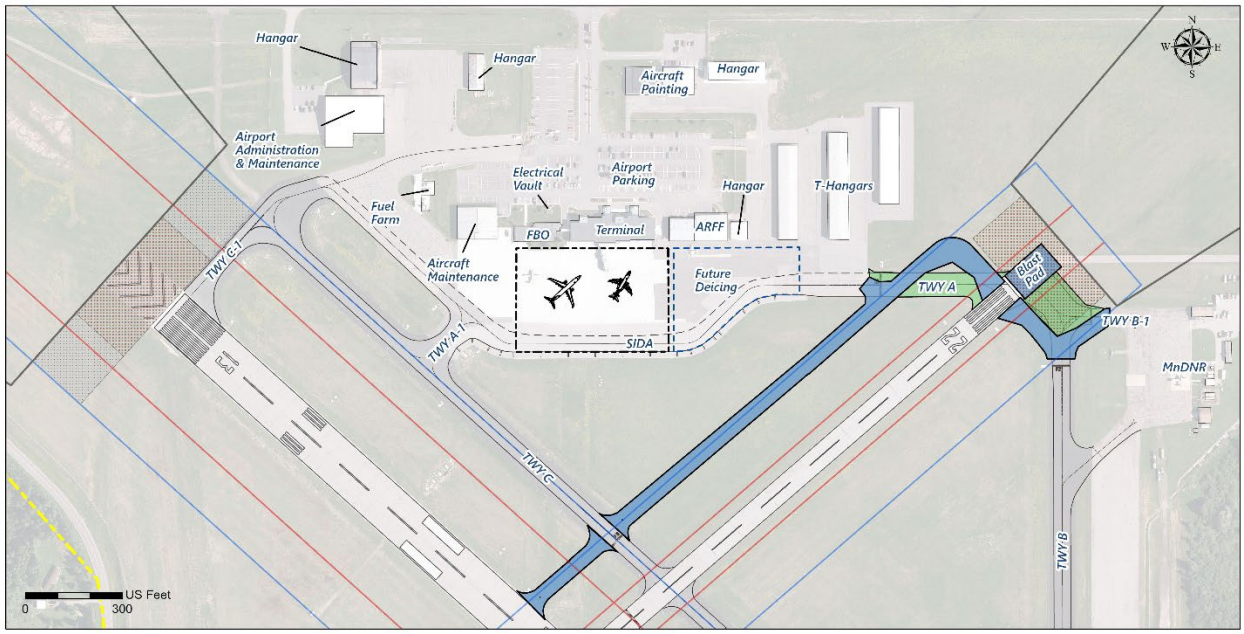
Alternative two also realigns and reconstructs the intersection of Taxiway A, Taxiway B, Taxiway B-1 and Runway 4-22 to meet FAA design standards, and similar alternative one, enables the blast pad to be constructed to meet standards as part of the process. Alternative two does not increase the size of any of the apron pavement through construction. Instead, it adds an ADG-III partial parallel taxiway[4] on the north side of Runway 4-22 which would enable Taxilane A to no longer be necessary for getting GA aircraft from the T-hangars to the north and west sides of the airfield. The taxilane traversing the air carrier apron could then be removed with general aviation aircraft required to taxi via the new partial parallel taxiway when going to/from the Runway 13-31 threshold area. The parallel taxiway would begin at the newly realigned taxiway intersection on the north side of Runway 22 and extend through Taxiway C

[4] A parallel taxiway is only required on precision instrument runways with less than ¾ mile visibility, therefore, Runway 4-22 does not require a parallel taxiway.

intersecting with Runway 13-31. There is also a short connector from the parallel taxiway that would connect it to the apron area south of the T-hangars. Assuming that the FBO eventually moves out of the core terminal area, the air carrier apron and SIDA could be redesignated in a portion of the transient apron space and extended south through Taxilane A, which would be obsolete to the east of Taxiway A-1.

Figure 3-18 shows terminal area airfield alternative two.

FIGURE 3-18
TERMINAL AREA AIRFIELD ALTERNATIVE TWO



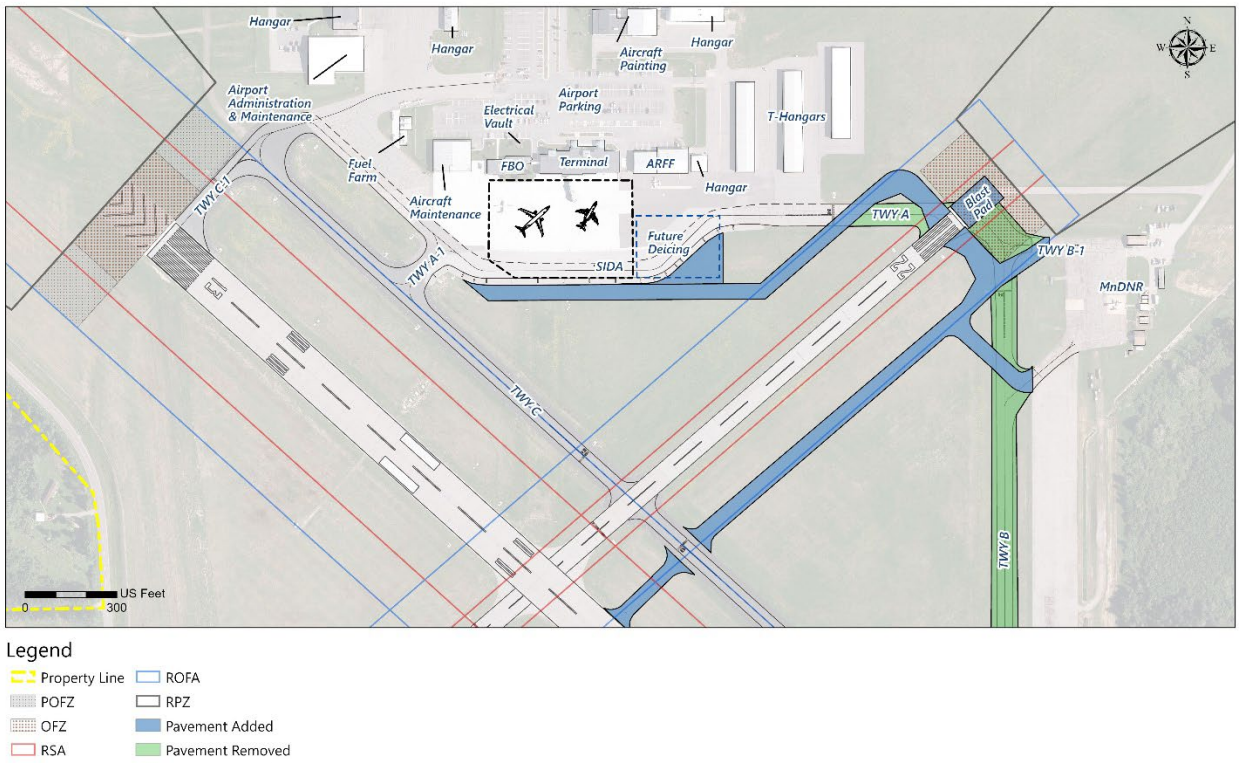
Source: RS&H Analysis, 2021

3.6.5.3 Terminal Area Airfield Alternative Three

Similar to the other alternatives, alternative three realigns and reconstructs the intersection of Taxiway A, Taxiway B, Taxiway B-1 and Runway 4-22 to meet FAA design standards, and like the other alternatives, it enables the blast pad to be constructed in the process. Alternative three is a blend of the concepts proposed in alternatives one and two. Like alternative one, it extends the southern and eastern segments of Taxilane A to increase the size of the air carrier apron and SIDA. Unlike alternative one, it only paves a portion of the unpaved area between the new partial parallel taxiway and existing pavement south of the T-hangars. Even with a smaller amount of pavement being constructed, there still would be adequate pavement to provide a future deicing pad/RON apron south of the ARFF facility. Leaving the unpaved area also provides additional space for drainage and snow removal. Similar to alternative two, this alternative is based on providing a partial parallel taxiway for Runway 4-22, the difference being that it would be constructed on the south side of the runway instead of the north side. The partial parallel taxiway on the

south side of the runway would align with the reconfigured intersection of Taxiway B, Taxiway B-1, and Runway 4-22. As an ADG-III taxiway, it would extend to the southwest and provide a connection to Runway 13-31, to help ensure that Runway 4-22 is not used as a connector taxiway. This concept is notable, as it makes a significant change to the orientation of the east side of the Airport. With the development of the parallel taxiway, Taxiway B becomes obsolete and could be closed in the long-term. However, the removal of Taxiway B could only take place during or after its replacement by the new parallel taxiway. It is critical than taxiway infrastructure allow continued operations by the DNR facilities which exist east of the Runway 22 threshold. Having removed Taxiway B, airside space is opened to enable a wide variety of GA and support facility layouts that can fill the prime property adjacent to the airfield. **Figure 3-19** shows terminal area airfield alternative three.

FIGURE 3-19
TERMINAL AREA AIRFIELD ALTERNATIVE THREE



Source: RS&H Analysis, 2021

3.6.6 Terminal Area Airfield and Deicing Alternatives

Each of the three presented terminal area airfield alternatives improves airfield safety by creating aircraft movement surfaces that meet FAA design standards. Deicing and stormwater management alternatives are described in **Appendix D**. All three terminal area alternatives are financially practical and implementable solutions that resolve current and future issues with the ability to maintain or improve operational efficiency. The major differentiating factor that sets alternative three apart from the others is its ability to accomplish all evaluation criteria goals while reorienting the airfield taxiways around the

existing runways. Doing this opens currently unavailable airport land for potential aeronautical development on the east side of the airport with less cost and environmental impact. **Table 3-9** shows the evaluation matrix for the terminal area airfield and decking alternatives.

TABLE 3-9
TERMINAL AREA AIRFIELD AND DEICING ALTERNATIVES EVALUATION MATRIX

Evaluation Criteria	Terminal Area Airfield and Deicing Alternatives			
	Existing Conditions	Alternative One	Alternative Two	Alternative Three
Safety	Fair	Good	Good	Good
Operational Efficiency	Fair	Fair	Good	Good
Meets FAA Design Standards	Poor	Good	Good	Good
Effectively Serves Target User	Fair	Good	Good	Good
Resolves Current Issues	Poor	Good	Good	Good
Meets Long-Term Facility Needs	Poor	Fair	Fair	Good
Appropriate Level of Service	Fair	Good	Good	Good
Ease of Implementation	Good	Good	Good	Good
Cost to Implement	Good	Fair	Fair	Fair
Flexible/Future Expansion	Poor	Fair	Fair	Good
EONS Impact	Fair	Good	Good	Good
Supports Sustainable Development Principles	Fair	Fair	Good	Good

Performance Legend

Good	Good
Fair	Fair
Poor	Poor

Source: RS&H, 2021

3.7 GENERAL AVIATION AND SUPPORT FACILITIES

The existing GA and Airport support (or support) facilities are expected to meet the Airport's demand over the short-term (estimated at five years). However, at some point during the Master Plan 20-year horizon many are anticipated to need expansion, reconfiguration, and/or updates.

Airport support facility requirements demonstrated the current space allocated for ARFF facility, airfield maintenance/snow removal equipment (SRE) facility, and administrative spaces are currently adequate but not optimal. The primary issue with these facilities is that the location and configurations are not ideal to support the Airport's staffing and management preferences.

The GA and support alternatives for HIB focus on four main aspects of improvement:

1. Relocation to provide space for ultimate terminal expansion
2. Align with the Airport's long-term vision for staffing, management, and administration
3. Enact strategic design improvements for safety and operational efficiency
4. Accommodate future facility expansion

General aviation and support facilities are important but dependent upon airfield and terminal area configurations. For this reason, facility alternatives for GA and support facilities will be done comprehensively.

3.7.1 Fixed-Base Operator and Transient Apron

The facility requirements indicate that the FBO facility and transient apron will not meet the demand of the Airport's general aviation community and visitors in their existing locations. Furthermore, their locations prevent necessary future expansion of the commercial terminal. Currently, there are not enough tie-down spaces for transient aircraft during periods of peak demand, nor does the FBO have a heated hangar to store aircraft during the colder months of the year. The Airport's fuel farm, which is operated by the FBO, is adequate for both Avgas and Jet A fuel over the planning horizon, but a new fuel farm would need to be collocated with a new replacement FBO.

Analysis of the transient apron showed a deficiency of 4,800 sq. yds. today and 8,300 sq. yd. by the end of the planning horizon. The confined space of the apron in this location poses a major conflict for any type of building or pavement expansion, with the air carrier apron and its SIDA requirements to the east and fueling and airfield facilities to the west. At the time when the terminal building and air carrier apron require an expansion, it will trigger a transition from a centralized layout approach to a decentralized or satellite hybrid layout for the FBO and transient apron facilities, if they have not already been relocated.

3.7.2 Hangars

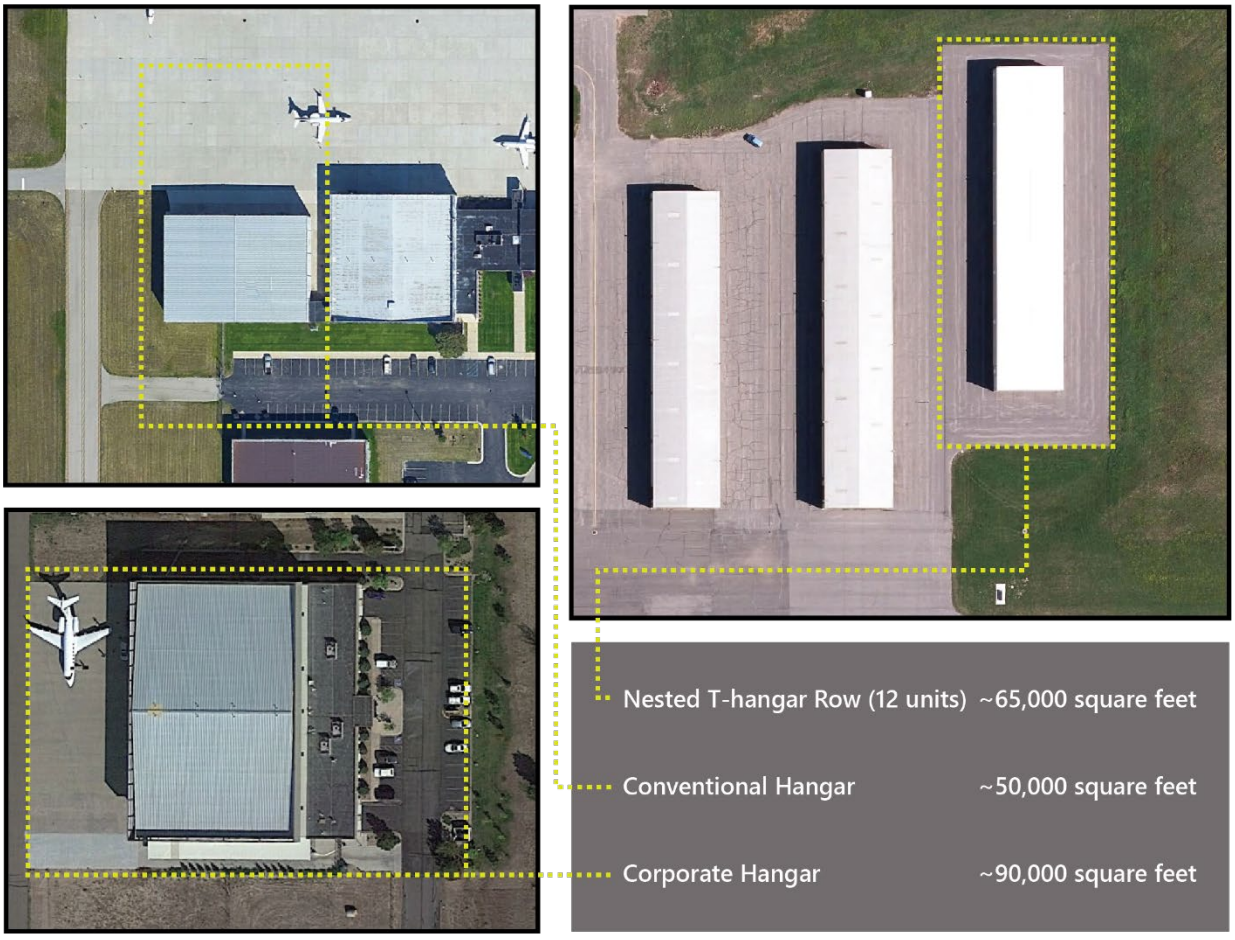
Range Regional Airport needs 11 additional T-hangars, three conventional hangars, and one corporate hangar to accommodate PAL 3 forecast demand. Hangar development is ultimately triggered by demand.

Hangar designs can vary depending on developer/owner preferences, Airport minimum standards and development requirements, and the size(s) of aircraft being stored. ACRP Report 113 describes the nested T-hangar configuration as one that is shorter and wider than the standard T-hangar. This type of

configuration helps optimize the developable space and reduce the required taxilane pavements. The nested T-hangar design is common at airports across the nation and can be standard size or customized based on hangar manufacturers. The standard T-hangar dimensions include 42 ft. on its widest side, down to 21 ft. on its shortest side, and 33 ft. deep.

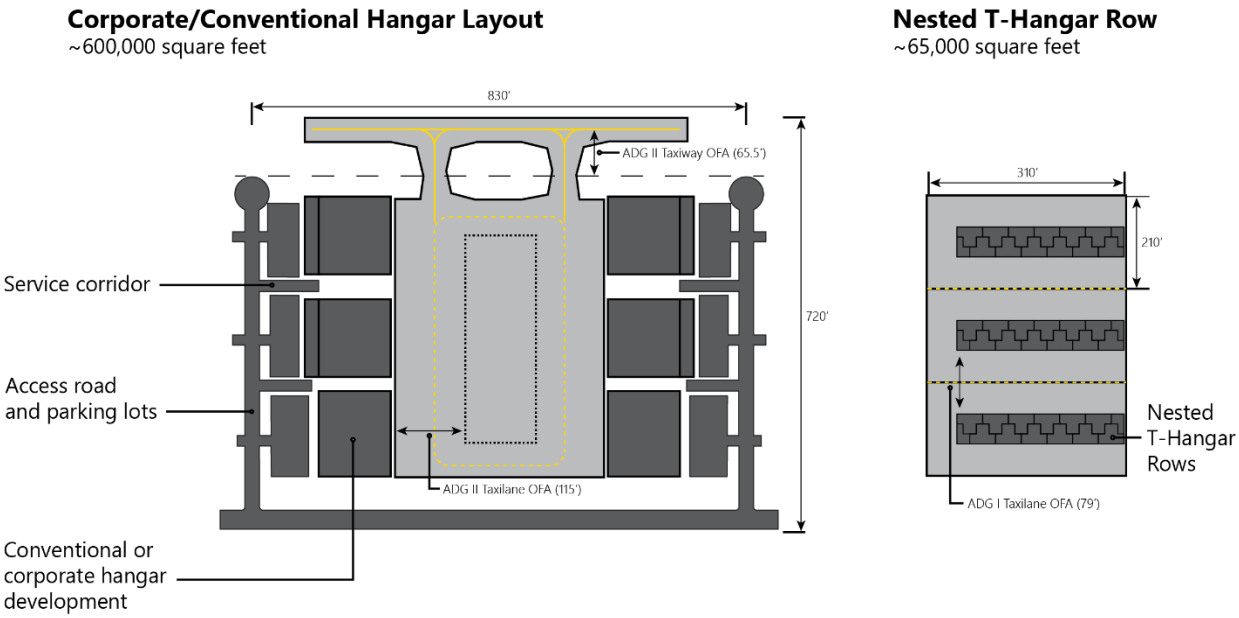
Overall, the footprints for all hangar facilities are much larger than just the building, as additional space is needed for airside and landside purposes. This includes protecting for taxilane object free areas. A building with 12 nested T-hangars would require approximately 65,000 sq. ft. of land. To be conservative and allow flexibility in hangar site design, a conventional hangar footprint would require approximately 50,000 sq. ft. of land and a corporate hangar would require approximately 90,000 sq. ft. As a result, large amounts of continuous acreage are highly desirable for GA development. **Figure 3-20** shows general space planning assumptions for varying hangar developments. **Figure 3-21** shows land area requirement assumptions for agglomerated conventional/corporate hangar and T-hangar developments.

FIGURE 3-20
GENERAL AVIATION HANGAR DEVELOPMENT SPACE PLANNING ASSUMPTIONS



Source: Google Earth; Martinez Geospatial Aerial Survey; RS&H Analysis, 2021

FIGURE 3-21
CONVENTIONAL/CORPORATE HANGAR DEVELOPMENT AND NESTED T-HANGAR DEVELOPMENT PLANNING AREA TEMPLATES



Source: Adopted and modified from ACRP Report 113, *Guidebook on General Aviation Facility Planning*; RS&H Analysis, 2021

3.7.3 Aircraft Rescue and Fire Fighting

The ARFF facilities currently meet the index B requirements and response times from the existing location. Moving toward a new decentralized or satellite layout approach, alternative ARFF sites have been considered to meet future development conditions. Given the ARFF building's proximity to the Terminal and lack of critical impact on limiting the terminal expansion, it is possible the ARFF facility could remain in its current location, until future terminal expansions necessitate moving it. This would likely occur well beyond the ARFF building's expected useful life. Because ARFF services are provided by an on-demand airport-staffed team, there is an added benefit to having the facility near, or connected to, the other maintenance and administrative facilities, depending on which positions have ARFF responsibilities.

3.7.4 Airport Administration

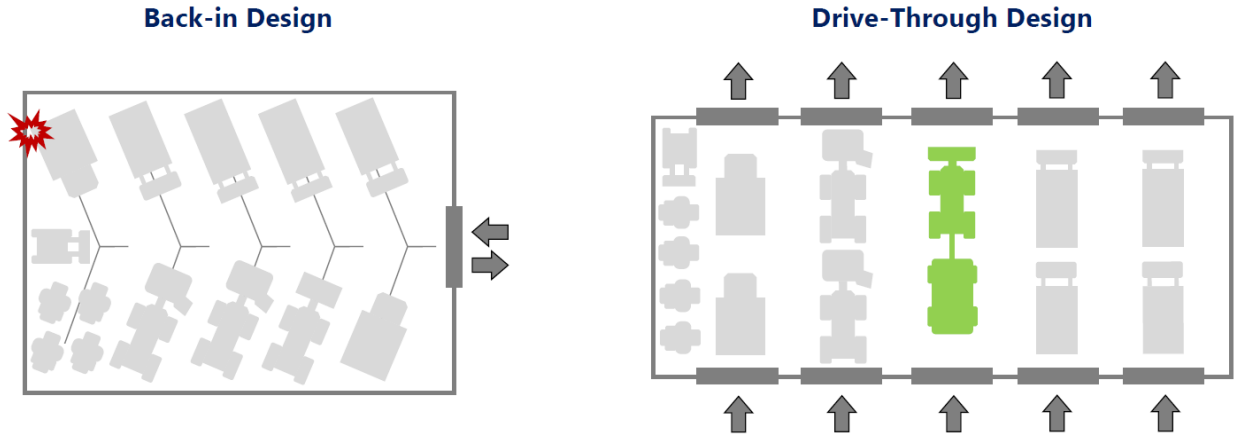
The airport administration office space is currently adjoined to the southern side of the field maintenance/SRE facility. Being collocated with the maintenance staff allows administrative staff to provide supplemental support for field maintenance and snow removal operations, especially during peak times. The spatial requirements are currently met in this designated area; however, the facility is located within the ultimate terminal facility envelope.

3.7.5 Airport Maintenance

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 lack of

an existing "back-in style" design is less operationally efficient and poses greater risks to staff safety and equipment integrity. **Figure 3-22** shows the preferred drive-through maintenance facility design that would improve the overall efficiency and safety during airport maintenance and SRE operations.

FIGURE 3-22
EXISTING BACK-IN DESIGN VS PREFERRED DRIVE-THROUGH MAINTENANCE FACILITY CONFIGURATION CONCEPT



Source: RS&H, 2021

3.7.6 General Aviation Facility Alternatives

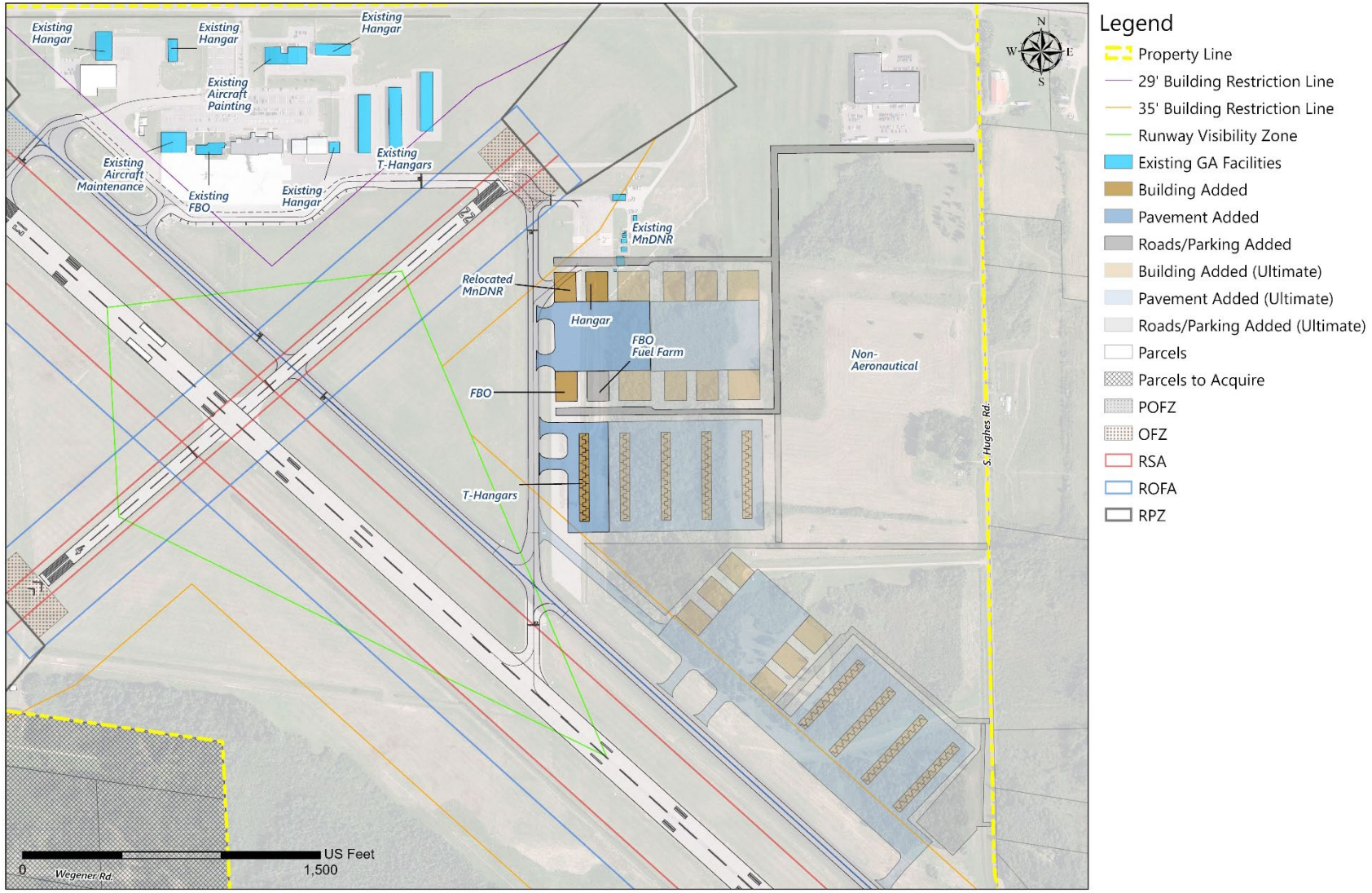
The GA facility alternatives were developed using the decentralized and satellite hybrid management layout approaches. With consideration to these approaches, two multi-phased high-level alternative development strategies were created for the east side of the airfield. This region of the Airport was selected because it provides the best location for aeronautical development with more than 120 acres[5] of Airport-owned land and electrical, water, and sanitary utility lines already on site. The decentralized and satellite hybrid layout alternatives will be evaluated along with the existing centralized layout approach of maintaining the facilities in the Airport's core. Both east side general aviation development alternatives rely on the construction of a new FBO facility and fuel farm as the essential anchoring component to future development on the east side of the airport.

The GA facilities alternative one aligns to the existing orientation of Taxiway B and develops facilities toward the east on an as-need basis. GA facilities alternatives one is shown in **Figure 3-23**.

GA facilities alternative two strategically adds in development aligned with the two runways without conflicting with Taxiway B until after it is removed, making the ultimate layout aligned with the orientation of Taxiway C and both runways. GA facilities alternatives two is shown in **Figure 3-24**.

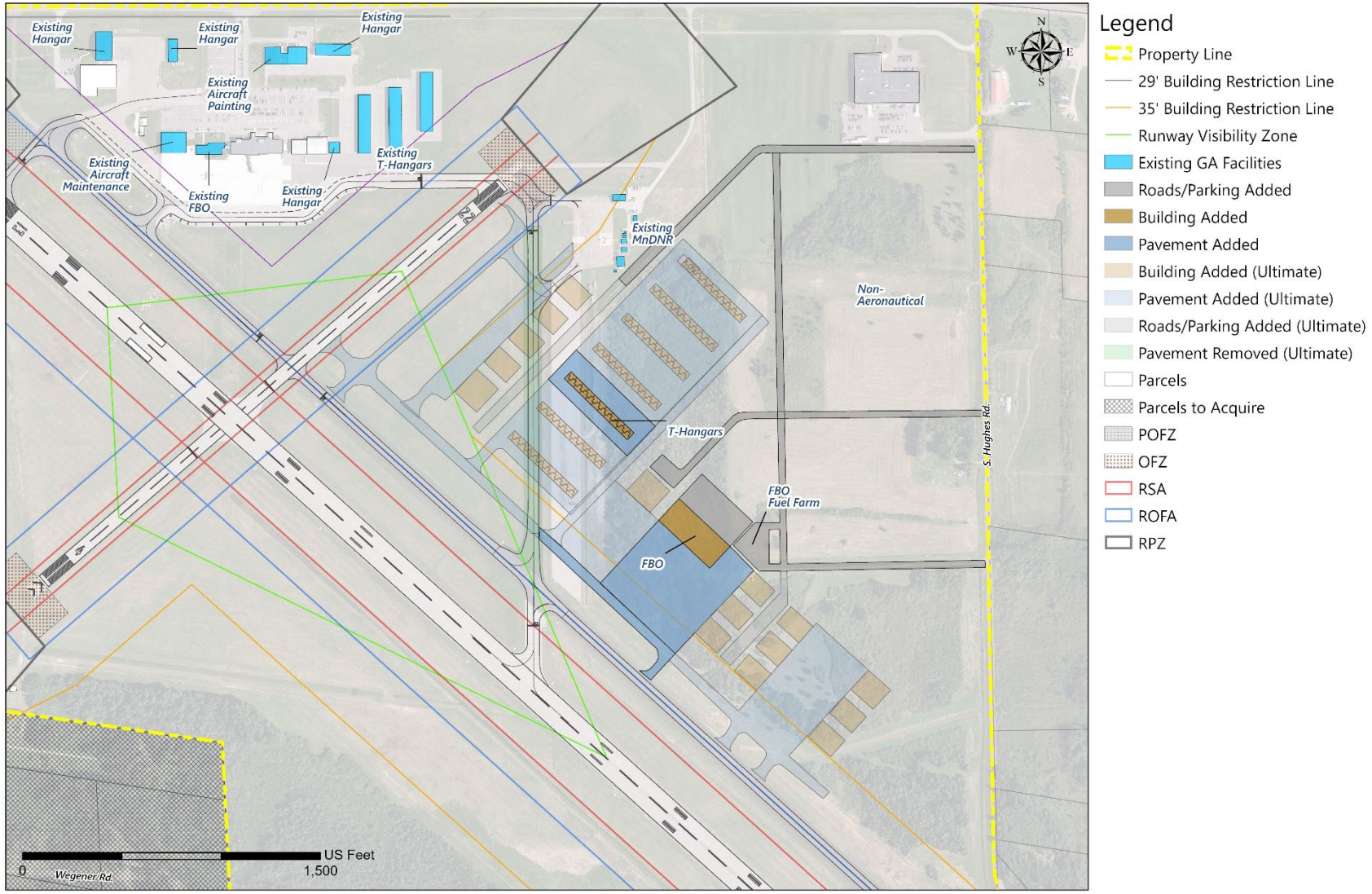
[5] Approximately 40 acres are assumed to be used for non-aeronautical development along S. Hughes Road.

FIGURE 3-23
GENERAL AVIATION FACILITIES ALTERNATIVE ONE



Source: RS&H, 2021

FIGURE 3-24
GENERAL AVIATION ALTERNATIVE TWO



Source: RS&H, 2021

3.7.6.1 Evaluation of GA Facilities Alternatives

An evaluation of the two GA facilities alternatives and a comparison to existing conditions is provided below and summarized in **Table 3-10**.

- **Safety:** The decentralizing of the GA facilities in both alternatives improves the overall safety of the Airport by separating GA operations from commercial aircraft operations, keeping GA activity away from the terminal apron SIDA and reducing potential for conflicts.

- **Operational Efficiency:** Comparatively, GA facilities alternative two has the most direct paths for taxiing GA aircraft by maximizing the space on both sides of Taxiway B, while, alternative one requires a greater distance to reach the runways due to the orientation of Taxiway B. The current centralized layout yields a short taxiing distance to both runways from existing facilities but poses serious safety concerns and can cause confusion and delay while aircraft maneuver to pass each other.

- **Meets FAA Design Standards:** The current setup of the transient apron does not support increased parking demand created by upgauging commercial aircraft or the situation where multiple commercial aircraft are parked at the terminal simultaneously. This potential conflict creates safety and security concerns because portions of the SIDA could be compromised if any GA aircraft were parked within it. Additionally, both proposed alternatives and the existing conditions meet FAA airfield design standards.

- **Effectively Serves Target User:** Currently, the GA users are accommodated by existing storage facilities. However, a distinctive GA campus in the decentralized or satellite layout approach would effectively serve them with new facilities. Comparatively, alternative one may hinder MnDNR expansion in place and cause the need for some facilities to be relocated, while alternative two would enable the MnDNR facilities to remain as-is and provide added space for future growth in a new more efficient configuration.

- **Resolves Current Issues:** Compared to the existing centralized layout, both alternatives would reduce occurrences of GA and commercial aircraft operating near one another; improve accessibility to airfield; and update the condition of the current FBO facilities and amenities for attracting itinerant aircraft and added revenue.

- **Meets Long-Term Facility Needs:** Compared to the existing centralized layout, both GA alternatives offer adequate space in the ultimate build-out for the development of additional GA storage facilities and airfield connections.

- **Ease of Implementation:** Because the centralized layout is already in use, there is no conflict for implementation. For each of the GA alternatives, the phasing of development would work with the design of the existing airfield, enabling it to remain fully functional during construction. Due to the reconfiguration of the taxiways/taxilanes alternative two, implementation would be slightly

more complex but not likely more costly. One distinct advantage to GA facilities alternative two is the ability to develop new facilities toward the airfield after the existing Taxiway B is removed. This is opposite of the typical development pattern which results in the oldest facilities in the most desirable location.

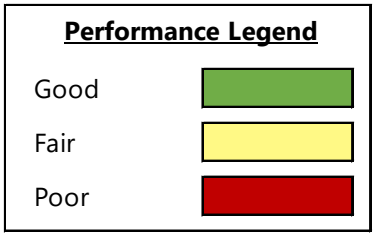
- **Cost of Implementation:** There would be no added cost for maintaining the existing centralized layout beyond typical expansion costs. Developing the east side of the Airport for general aviation would also include the typical development costs associated with environmental planning, design, and construction services, as would any development at the Airport. Prudent planning and strategic timing of the development of east side facilities shown in the GA facilities alternatives can reduce or eliminate any burden that might be borne by tenants as existing facilities would have reached the end of their useful life.

- **Flexible for Future Expansion:** The existing conditions pose space constrained near-term solutions to store based aircraft and the FBO and transient apron have no viable options for expansion. While both GA facilities alternatives provide a substantial amount of acreage for GA development, alternative two provides a greater amount of land by using land on both sides of existing Taxiway B.

- **Aligns with Airport Staffing:** Both GA facilities alternatives would improve the workload of the Airport's staff when adjusting management structures to either the D-1 or H-1 staffing alternatives described in **Section 3.2**.

TABLE 3-10
GENERAL AVIATION ALTERNATIVES EVALUATION MATRIX

Evaluation Criteria	General Aviation Facilities		
	Existing Conditions	Alternative One	Alternative Two
Safety			
Operational Efficiency			
Meets FAA Design Standards			
Effectively Serves Target User			
Resolves Current Issues			
Meets Long-Term Facility Needs			
Ease of Implementation			
Cost to Implement			
Flexible/Future Expansion			
Aligns with Airport Staffing and Management			



Source: RS&H Analysis, 2021

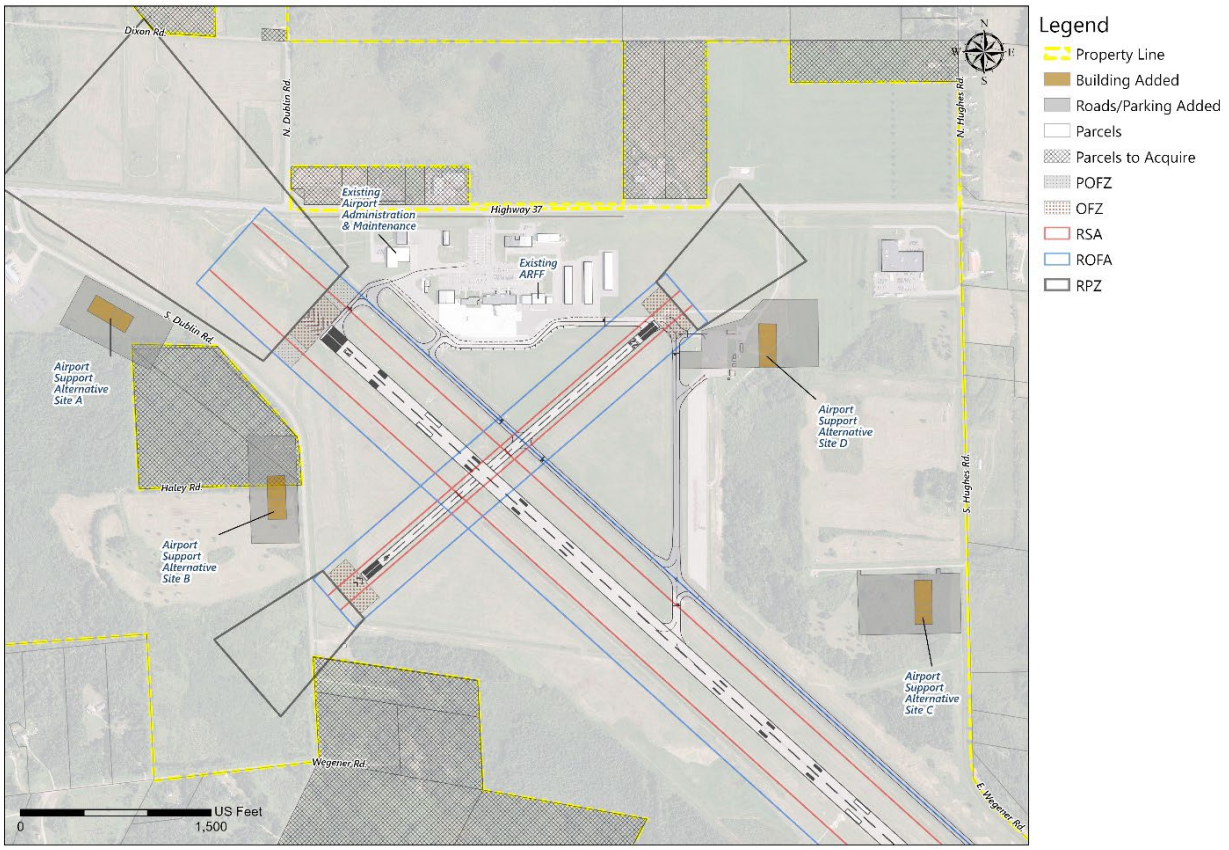
3.7.7 Airport Support Alternatives

The Airport's long-term development of support facilities hinges heavily on the Airport's approach to management and staffing. The gap analysis of the Airport's staff in **Section 3.2.3** showed that there is a benefit to having the administration, field maintenance/SRE, and ARFF facilities in the vicinity of one another.

The Airport support alternatives were developed using the decentralized and satellite hybrid layout approaches. With consideration to these approaches, four alternative sites were developed with footprints capable of accommodating a combined ARFF, airfield maintenance, and administration facility.

Alternative site A is located south-southwest of S. Dublin Road on the west side of the Airport. Alternative site B is more centrally located west of S. Dublin Road on the west side of the Airport, near Runway 4. Alternative site C is located on the west side of S. Hughes Road, and east of the intersection of Taxiway B and Taxiway C. Alternative stie D is located east of Runway 22, in the vicinity of the existing MnDNR facilities. **Figure 3-25** shows the four alternative sites for the Airport support facilities in relation to one another.

FIGURE 3-25
AIRPORT SUPPORT ALTERNATIVES



Source: RS&H, 2021

3.7.7.1 Evaluation of Support Facilities Alternative Sites

This section evaluates the four alternative support facilities sites along with a comparison to existing conditions (summarized in **Table 3-11**).

- **Land Acquisition:** Alternative sites A and B are both located partially off Airport property, creating an additional expense to acquire the land, compared to alternative sites C and D which are on land that is fully owned by the Airport.

- **Safety:** Alternative sites A and B are separate from other Airport users but their locations on the west side of the airfield with no direct on-airport access to the core terminal area requires either

the establishment of a new service road or use of existing public roads. Using public roads poses increased safety risks as large pieces of equipment would have to traverse multiple times per day. Comparatively, the centralized layout and alternative sites C and D are fully on Airport property reducing the need for equipment to be on public roads.

- **Proximity to Roads:** Alternatives sites A, B, and C are all alongside public roads. This provides the opportunity for the ARFF and/or maintenance facility to be considered for shared services with local municipalities.

- **Operational Efficiency:** Alternative sites C and D would likely have the greatest efficiency due to its proximity to the center of the airfield as well as their ability to remain unaffected by commercial operations.

  In all four alternatives, the facilities have the option of being combined into one large building with shared parking, compared to the centralized layout that currently exists where the ARFF and maintenance buildings are separated.

- **Flexible/Future Expansion:** All four facilities have the potential for flexible expansion in the future, but given the location of alternative site C, it would have the most versatile options. One issue considered with maintaining the existing maintenance facility is a lack of viable options to expand in place.

- **Ease of Implementation:** Alternative sites A, B, and C have minimal implementation concerns; however, alternative site D has the added challenge of working around existing MnDNR facilities.

- **Cost to Implement:** Compared to maintaining the existing facilities, each of the alternative sites would require significant costs for environmental planning, design, and construction services. While the utility connections would be the least impactful at alternative site D, due to its proximity to the existing main lines, it would require added costs for the demolition of MnDNR facilities.

- **Aligns to Airport Staff and Management:** The centralized layout would not improve the workload of the Airport staff. However, if alternative site C was near the future FBO, staff could be shared as shown in alternative D-2 and H-2 of the Airport staff gap analysis.

TABLE 3-11
SUPPORT ALTERNATIVES EVALUATION MATRIX

Evaluation Criteria	Support Facility Alternatives				
	Existing Conditions	Alternative Site A	Alternative Site B	Alternative Site C	Alternative Site D
Land Acquisition	Good	Poor	Poor	Good	Good
Safety	Good	Fair	Fair	Good	Good
Proximity to Roads	Fair	Good	Good	Good	Fair
Operational Efficiency	Fair	Poor	Fair	Good	Good
Flexible/Future Expansion	Poor	Fair	Fair	Good	Fair
Ease of Implementation	Good	Good	Good	Good	Poor
Cost to Implement	Good	Fair	Poor	Fair	Fair
Aligns with Airport Staffing and Management	Poor	Fair	Fair	Good	Good

Performance Legend

Good	
Fair	
Poor	

Source: RS&H Analysis, 2021

3.7.8 General Aviation and Support Alternatives Summary

The evaluation summary matrices for each support facility alternative show GA alternative two and support alternative site C perform the best. Comprehensive alternative layouts will combine the GA and support alternatives to show how the two functions would coexist within the context of all airport facilities.

Both GA alternatives are consistent in their objective to relocate the FBO and transient apron to enable expansion of the commercial service terminal. The east side of the Airport is the ideal location for the FBO and transient apron as well as other new GA facilities. Implementation of new facilities in this area is practical due to the expansive acreage already owned by the Airport and the utilities that extend into the area. Both GA alternatives will be considered during the comprehensive layouts, however, GA facilities alternative two is emerging as the most promising concept because of its ability to maximize the airfield and developable space by aligning its configuration with both runways. Configuring development in alignment with the airfield creates more direct airside access for tenants and provides a large space for the ultimate buildout. It also enables the Airport to continue to use the existing layout even as the cornerstone FBO and initial T-hangars are constructed. Eventually, under GA alternative two, the new

FBO's location would make it proximal to each of the GA tenants and act as a foundational development that later facilities can be expanded from.

After assessing the roles and responsibilities of Airport staff and the need for shared staff to be used for ARFF service and added support during peak times or inclement weather, a multi-use building or campus is the logical preferred concept for the support services. This evaluation shows that Alternative site C has the most promising site attributes for future support facilities, but all options will be reviewed within the context of the comprehensive alternatives.

3.8 FUTURE LAND USE OVERVIEW

The comprehensive Airport development alternatives were generated by incorporating the best aspects of preliminary alternatives with consideration given to all evaluation criteria holistically, along with variables that would influence their long-term economic viability, operational efficiency, natural resource impacts, and socially responsibility. This section summarizes why the development and improvements planned for the various areas of the Airport listed below, were included into each comprehensive alternative.

- Airfield Improvements
- Terminal Expansion
- Aeronautical Development
- Non-Aeronautical Development

3.8.1 Airfield Improvements

The extension of Runway 13-31 to the southeast is an essential improvement the Airport should plan for to safely accommodate its existing and future commercial fleet and markets. An extension is also an important improvement that can help ensure all aircraft have adequate runway length to safely land during periods of inclement weather when weather monitoring equipment reports runway conditions as suboptimal. At minimum, the extension should be 642' long, resulting in a 7,400' long x 150' wide runway. Ultimately, the Airport should plan to acquire and preserve enough land to extend the runway up to a total of 8,000' at full buildout.

Other airfield improvements necessary within the comprehensive development plan include:

- Demolition and removal of the connecting segment of Taxiway B south of Taxiway C
- Reconfiguration of Taxiway A – Runway 22 – Taxiway B and Taxiway B-1 intersection with pavement demolition and removal and pavement construction

3.8.2 Terminal Expansion

The long-term expansion and development of the terminal/landside facilities is based on demand, and regardless of the configuration and layout that is selected and designed, there will be a substantial amount of space beyond the extent of the existing facilities footprint that is required. This extent includes land both east and west of the existing facilities, and northward as bounded by Highway 37. As a result, the space required for buildout of the terminal and landside facilities within the planning period has been identified as an envelope of space. These combined areas will be shown in each of the comprehensive alternatives and identified as terminal airside and landside, and terminal expansion areas to ensure the space has been designated for those uses.

3.8.3 Aeronautical Development

There are currently multiple general aviation and support facilities that conflict with long-term terminal/landside facilities within the Airport's central core. It has been concluded that the best alternative to resolve this, is to plan for them to be relocated to the Future East Development Area as shown in the general aviation and support alternatives. Similarly, the Airport's support facilities were evaluated for relocation to one of the four Airport support alternative sites, and the results showed that the sites on the east side of the Airport were most ideal. To preserve these areas, the property east of Taxiway B and north of Taxiway A has been identified as future aeronautical development.

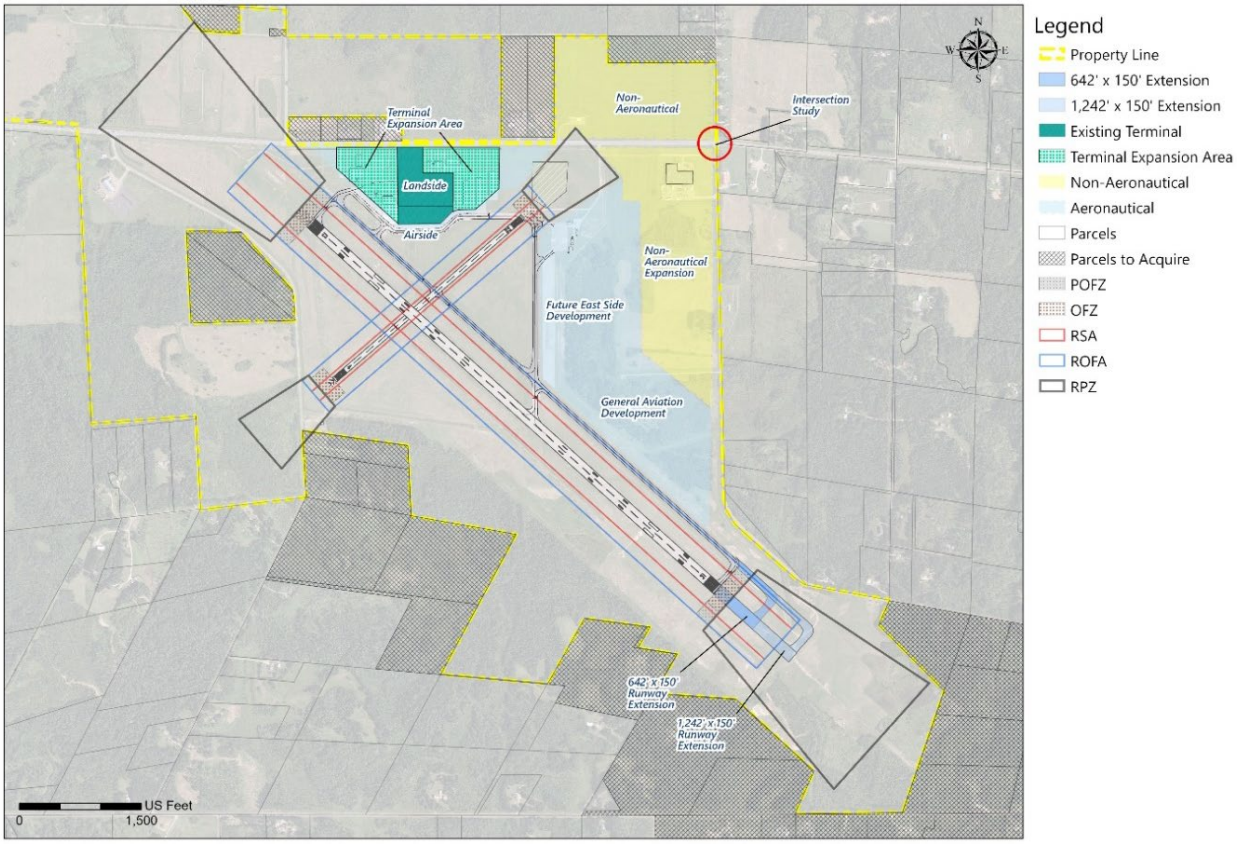
3.8.4 Non-aeronautical Development

North and east of the identified aeronautical development, and west of S. Hughes Road, there is an extensive amount of the Airport's property that is designated for future non-aeronautical development. This area begins at the outer base of the Runway 22 RPZ and extends across Highway 37. The section of Airport property on the north side of Highway 37 has also been identified by the Airport as a potential site for a future solar farm. On the southwest corner of the Highway 37 and S. Hughes Road intersection, the Airport currently has an industrial tenant, who has expressed interest to expand their facilities to the west. Given this land use designation, the tenant would have sufficient room to expand a facility equal to its existing building and parking areas. Finally, the area east of the Future East Development Area, there is a substantial amount of Airport property that is planned for other non-aeronautical tenants. Future access points and roadways should be added strategically to the area to support these sites and also provide adequate roads and parking to aeronautical users to the west. These areas do not currently have defined boundaries. A general overview of where non-aeronautical development should occur will be labeled on the comprehensive Airport alternatives.

3.8.5 Future Land Use Summary

A future land use overview map shown in **Figure 3-26** was created to provide guidance for long-term to ultimate development on the north and east sides of the Airport. All comprehensive alternatives will show the future and ultimate Runway 13-31 extension making it 7,400' long by 150' wide. Additionally, a detailed study on the intersection of Highway 37 and S. Hughes Road should be programmed to ensure safe vehicular traffic can be maintained with the increase in traffic anticipated with developing the east side of the Airport.

FIGURE 3-26
AIRPORT FUTURE LAND USE OVERVIEW



Source RS&H, 2021

3.9 COMPREHENSIVE AIRPORT ALTERNATIVES

The following sections discuss the two comprehensive Airport development alternatives. Each comprehensive alternative is founded upon the need to accommodate necessary expansion of facilities that provide or support commercial activities while improving safety and efficiency for both commercial and general aviation operations. The alternatives also place a high emphasis on supporting the general aviation community's vision of sustaining a high level of service for the general aviation community. At HIB, achieving both commercial and general aviation needs is best performed by decentralizing the general aviation and certain airport support facilities away of the Airport's terminal core over time. In each proposed alternative, the construction of new modern FBO facilities providing a higher level of service is a foundational project that becomes a 'corner stone' for the development of other general aviation and support facilities in the future.

3.9.1 Comprehensive Alternative One

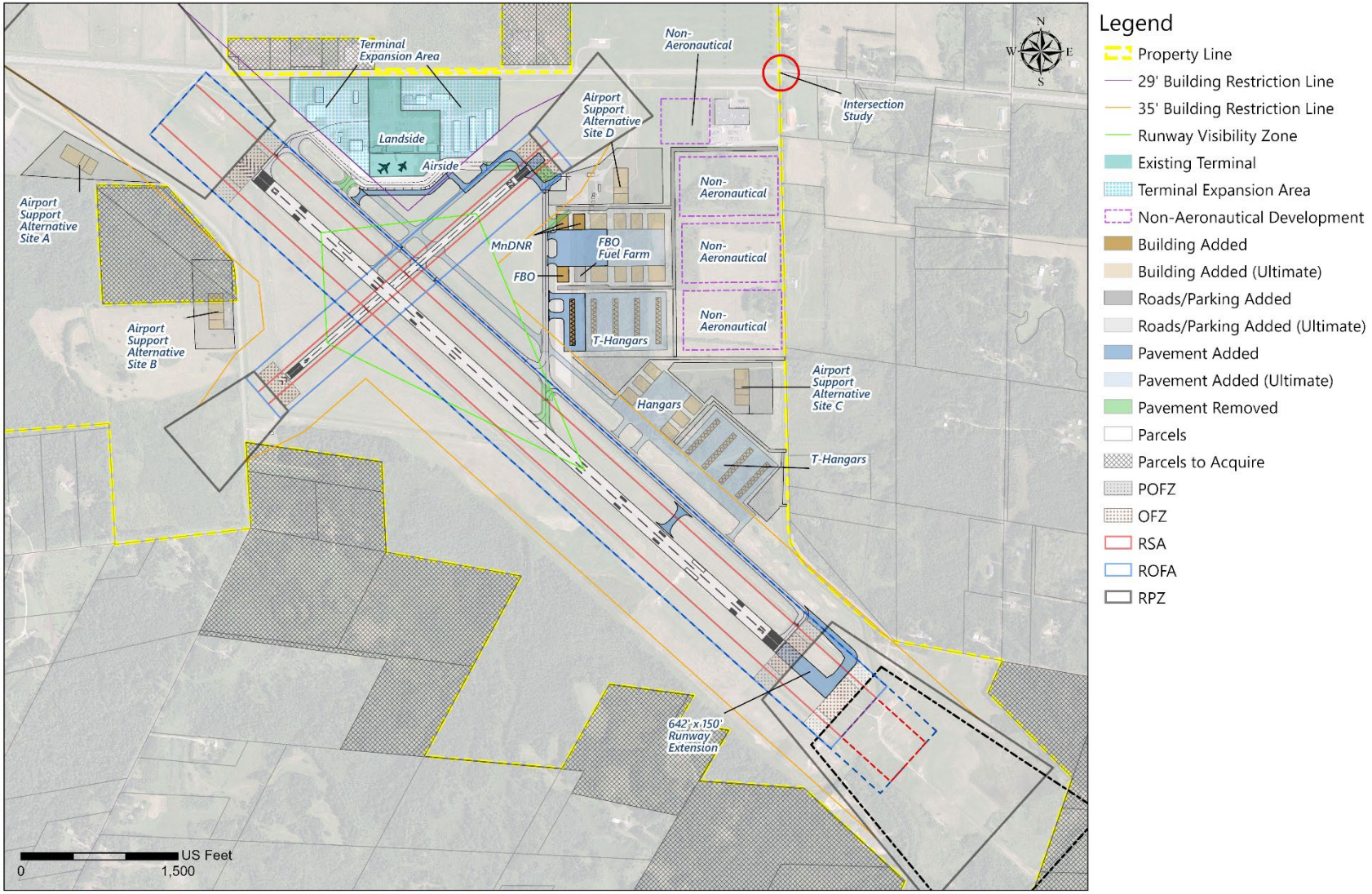
Comprehensive alternative one is defined by the following improvements:

- The airfield intersections for the Taxiway A/Runway 22/Taxiway B/Taxiway B-1 area are corrected by reconfiguring them to meet FAA design standards.

- The configuration of Taxiway B is maintained and the East Development Area orients new development along the eastern side of Taxiway B and the northeast side of Taxiway C.
- The layout of the general aviation facilities is based on GA alternative one. Basing development off this existing airfield orientation, the 35' building restriction line (BRL) limits the proximity of hangars and buildings to the airfield. As a result, the construction of a new FBO hangar/terminal facility, transient apron, and FBO fuel farm is located midway between Taxiway C and B-1 on the east side of Taxiway B. This foundational project enables the expansion of the terminal and air carrier apron for increased service.
- With the newly defined GA area, new/replacement MnDNR facilities would be relocated to the opposite side of the FBO's transient apron with proximity and access to the amenities of the new FBO facilities.
- New or replacement T-hangars would be developed south of the new FBO with access to Taxiway B. Future rows of nested T-hangars would be built based on demand to the east of the first building.
- Ultimately, the footprint of the FBO facilities, transient apron and fuel farm is comparable to the footprint of the T-hangars, which provides flexibility for future development planning as warranted by existing circumstances.
- Further GA development is planned to the northeast of Taxiway C as influenced by demand. The number of T-hangars or conventional/corporate hangars and their layouts are also flexible with the demand of the Airport at that time decisions are made.
- All development on the east side of the Airport relies on roadway and access points to S. Hughes Road. The necessary roadways will provide access to the facilities and be incorporated to the ultimate road network of the layout.
- All proposed support facility alternative sites are possible in comprehensive alternative one, however, Site D is the most viable option. This is due to its proximity to the airfield for timely, direct access for ARFF and SRE/maintenance equipment, ability to accommodate additional future development, and the ability to effectively provide infrastructure necessary for the other facility alternatives.

Comprehensive alternative one is shown in **Figure 3-27**.

FIGURE 3-27
COMPREHENSIVE ALTERNATIVE ONE – TAXIWAY B ORIENTATION



Source: RS&H Analysis, 2021

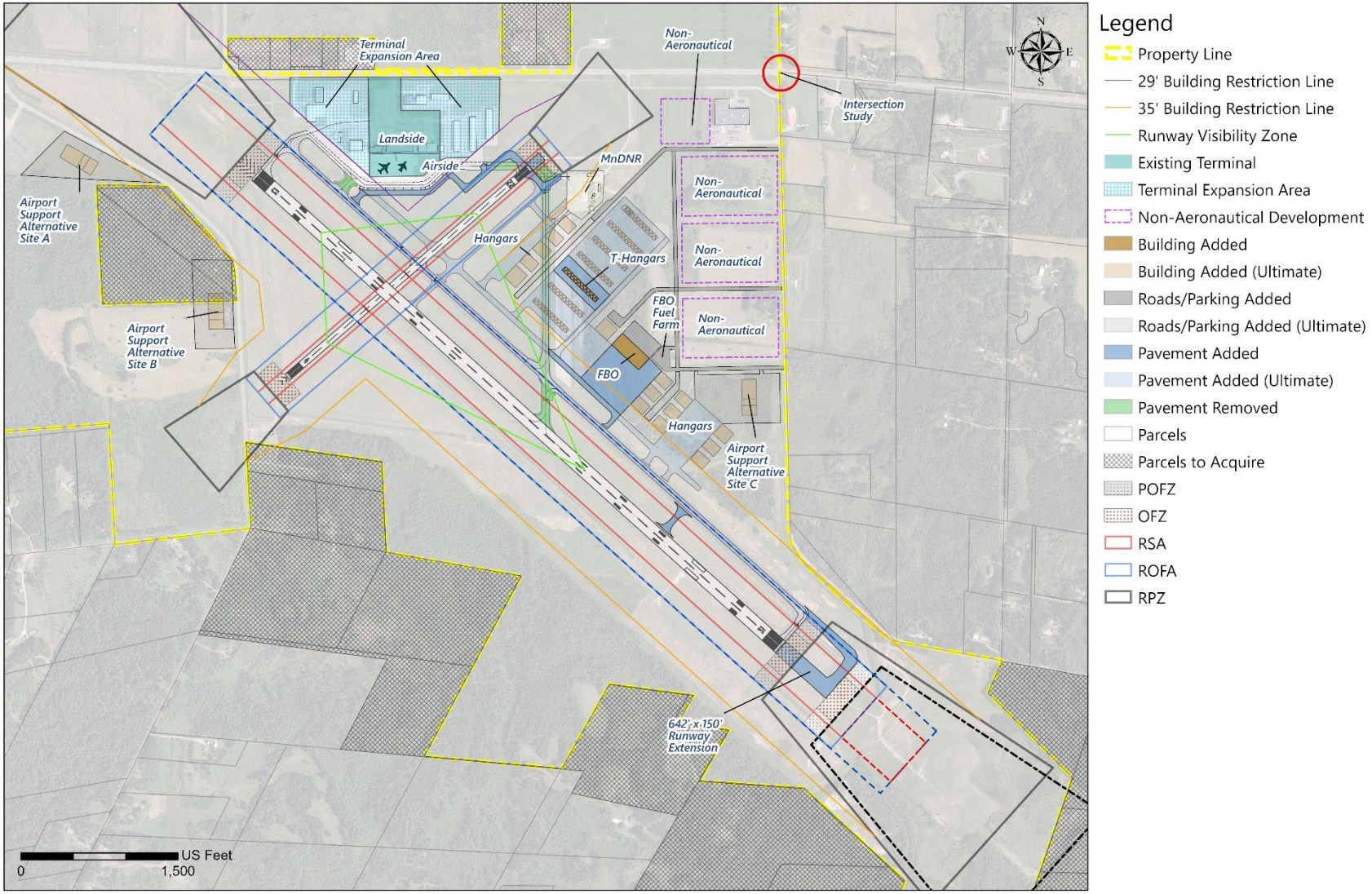
3.9.2 Comprehensive Alternative Two

Comprehensive alternative two is defined by the following improvements:

- The airfield intersections for the Taxiway A/Runway 22/Taxiway B/Taxiway B-1 area are corrected and under a new arrangement where the Taxiway B/B-1 intersection becomes the north end of a future taxiway parallel to Runway 4-22. After the taxiway is realigned, all future aprons, taxiways, and taxilanes will then be aligned to match the orientation of the two-runway system, resulting in safe, efficient, and organized facility development on newly available developable acreage adjacent to the airfield.
- In preparation for the ultimate removal and replacement of existing Taxiway B, the taxiway connection to the Runway 22 threshold is reconfigured to establish a new orientation that accommodates a future taxiway north of the existing Taxiway C paralleling Runway 4-22.
- The layout of the new replacement FBO and hangars is based on GA alternative two. The placement of the new FBO, transient apron, and FBO fuel farm are strategically located to allow use of the existing taxiway system, while positioning for the later reconfiguration of airfield taxiways. With the construction of new FBO facilities on the east side of the Airport, the terminal and air carrier apron are able to expand for increased service.
- The MnDNR remains at its current site and is connected to the new realigned taxiway near the north end of Taxiway B and Taxiway B-1, therefore allowing it the ability to expand in a manner that is consistent with future airfield and facility development plans.
- The single row of nested T-hangars forecast as needed to meet facility requirements over the planning period is constructed east of Taxiway B in an orientation consistent with future facility plans while still providing simple access to existing Taxiway B. Orienting the new T-hangar row this way means that no airfield changes are necessary to begin working toward the new facilities orientation in the short-term. As demand grows, the plan provides flexibility to add more nested T-hangars buildings to the east and west, depending on the timing of replacing Taxiway B, until the T-hangar area reaches full buildout.
- All further GA development on the east side of the airfield is planned to orient hangars parallel to the Taxiway C and the future parallel taxiway of Runway 4-22. The conceptual layout shows new conventional/corporate hangars in the south, but the design is flexible enough to accommodate different sizes and styles of hangars as demand dictates.
- All development on the east side of the Airport relies on roadway access to S. Hughes Road. These roadways be incorporated to the ultimate road network of the preferred comprehensive layout.
- All proposed support facility alternative sites (**Section 3.7**) are possible within the framework of comprehensive alternative two. However, Site C is the most viable long-term development option. By taking advantage of planned future apron space, it would connect to the airfield through a shared conventional/corporate hangar apron and have direct access to S. Hughes Road.

Comprehensive alternative two is shown in **Figure 3-28**.

FIGURE 3-28
COMPREHENSIVE ALTERNATIVE TWO – TAXIWAY C ORIENTATION



Source: RS&H Analysis, 2021

3.9.3 Preferred Comprehensive Alternative

The performance of the two comprehensive alternatives was evaluated according to the established criteria categories. Comprehensive alternative two provides the greatest performance overall by offering long-term development flexibility and better fulfilling Airport goals and objectives identified during Airport stakeholder visioning. Refinements were made to the Taxiway alignment to include Terminal Area Airfield Alternative 3 elements. **Table 3-12** shows the evaluation of the two comprehensive Airport development alternatives. The refined preferred comprehensive alternative is shown its ultimate layout in **Figure 3-29**.

TABLE 3-12
COMPREHENSIVE DEVELOPMENT ALTERNATIVES EVALUATION

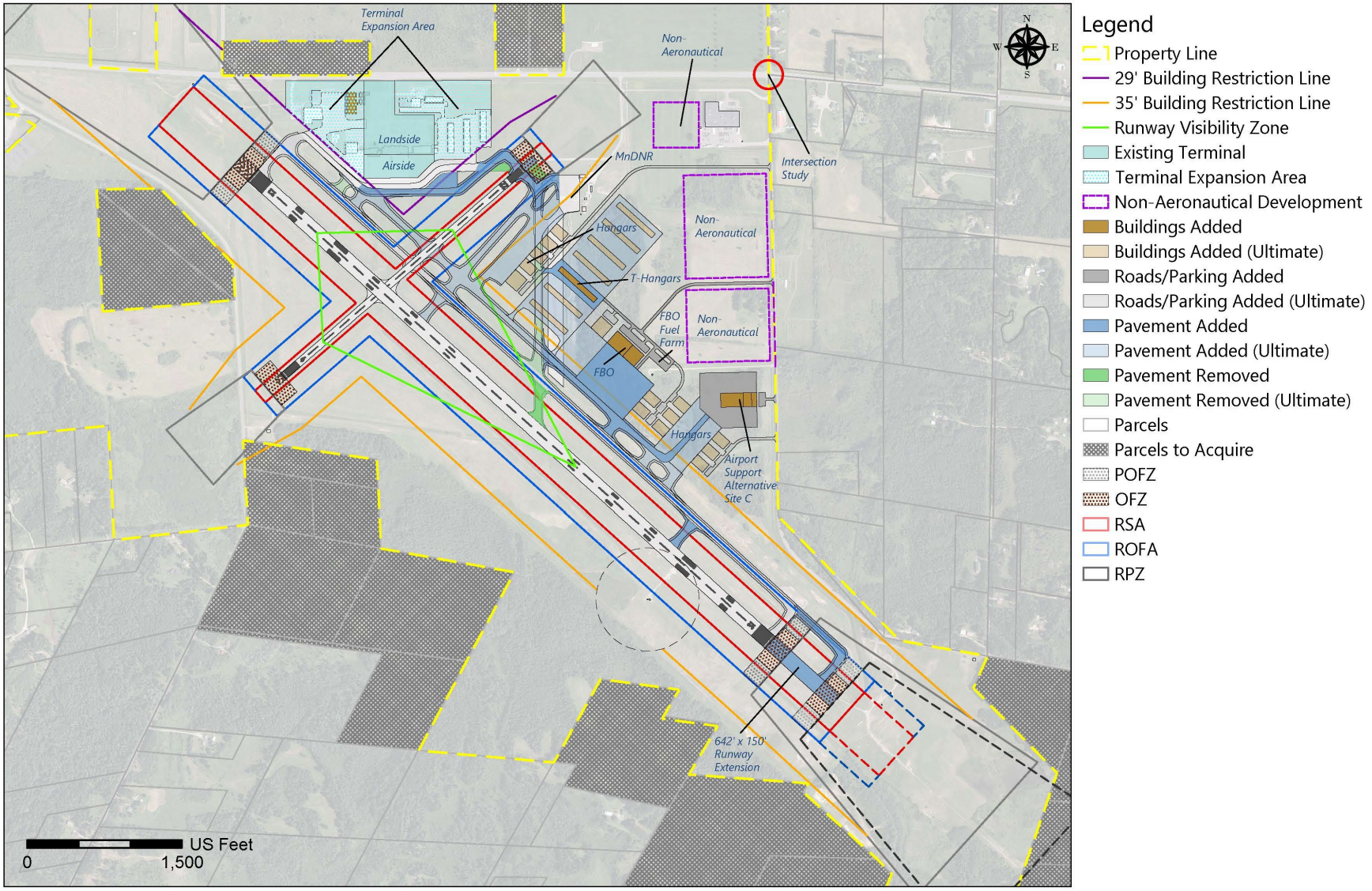
Evaluation Criteria	Comprehensive Alternatives		
	Existing Conditions	Alternative One	Alternative Two
Safety	Fair	Good	Good
Operational Efficiency	Poor	Fair	Good
Meets FAA Design Standards	Fair	Good	Good
Effectively Serves Target User	Fair	Good	Good
Resolves Current Issues	Poor	Fair	Good
Meets Long-Term Facility Needs	Poor	Fair	Good
Appropriate Level of Service	Fair	Good	Good
Ease of Implementation	Good	Good	Fair
Cost to Implement	Good	Fair	Fair
Flexible/Future Expansion	Poor	Good	Good
EONS Impact	Poor	Fair	Good
Supports Sustainable Development Principles	Poor	Fair	Good

Performance Legend

Good	
Fair	
Poor	

Source: RS&H Analysis, 2021

FIGURE 3-29
PREFERRED COMPREHENSIVE AIRPORT DEVELOPMENT



Source: RS&H Analysis, 2021