2024 Airport Master Plan Update

LLOYDMINSTER AIRPORT

October 9, 2024

HM Aero Aviation Consulting

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1. INTRODUCTION

1.1. Lloydminster Airport

Lloydminster Airport (the "Airport") is owned and operated by the City of Lloydminster (the "City"). City Council serves as the governing body for the Airport, with the facility's direction implemented through the City Manager by the Operations and Economic Development Departments. The operation of the facility is overseen by an Airport Manager reporting to the Director of Transportation Services; four employees are responsible for the administration and operation of the Airport. The Airport serves the needs of a diverse range of commercial, private, and government aviation users and functions as:

- A transportation hub, tourism gateway, and economic driver for Lloydminster and the region;
- An enabling asset for air ambulance and airborne law enforcement programs;
- A centre for aviation business and flight training; and
- A base for private aircraft owners and operators.

The Airport's Vision Statement is that:

> *Lloydminster Airport shall be a transportation, economic development, and community asset through responsible growth, financial sustainability, and service excellence. The Airport will be recognized as one of the top regional facilities in the Prairies.*

1.2. 2020 Airport Master Plan

1.2.1. Overview

In 2019, HM Aero Aviation Consulting was retained by the City with support from the County of Vermilion River to prepare a Master Plan for the Airport. The Master Plan was prepared to serve as a comprehensive guiding document for the period of 2020 to 2045 and:

- Ensure safe and efficient Airport operations;
- Guide the City in the progressive development of the Airport;
- Forecast demand and provide cost-effective and defensible recommendations to support future activity levels;
- Maximize the value of the Airport to the region as a socioeconomic asset by planning for development and revenue generation opportunities;
- Ensure that future land uses represent the highest and best use of the Airport and are compatible with the site context; and
- Gain a comprehensive understanding of stakeholder views.

Three planning horizons were established through the Master Plan:

1. **Short Term:** 2021 to 2025;
2. **Medium Term:** 2026 to 2030; and
3. **Long Term:** 2031 to 2045.

The Master Plan was completed in April 2020 and was presented to City Council on June 15, 2020.

1.2.2. Implementation

Following the completion of the Master Plan and its receipt by City Council in June 2020, work commenced on the implementation of its recommendations. Major developments are shown in Table 1.

Table 1 - Major Airport Developments, 2020-2024

Year	Major Developments
2020	**March:** Declaration of COVID-19 as a pandemic by the World Health Organization **April:** Master Plan completed **April:** WestJet service frequencies substantially reduced in response to the COVID-19 pandemic **June:** Master Plan received by City Council
2021	**March to July:** Temporary pause of WestJet services **May:** Airports Capital Assistance Program funding ($105,000) awarded by Transport Canada for an airfield de-icing trailer **August:** Regional Air Transportation Initiative funding ($348,000) awarded by Prairies Economic Development Canada for the following projects: ▪ Airport website updates ▪ Groundside wayfinding and destination signage ▪ Cardlock payment terminal for the aviation fuelling system ▪ Runway crack sealing and line painting **December:** Funding awarded by Transport Canada through the Airports Capital Assistance Program ($830,000) for the acquisition of a new plow truck and grader.
2022	**January:** Approval granted for lands to the west and north of the Airport to be annexed from the County of Vermilion River to protect for future expansion requirements
2023	**May:** WestJet service frequencies recover to 2019 levels **December:** Adoption of Airport Operation and Management Bylaw
2024	**April:** WestJet services permanently suspended **May:** Regional Airport Development Grant funding ($114,000) awarded by the Province of Alberta for the following projects: ▪ Airport Master Plan Update ▪ Commercial Air Services Feasibility Study

The COVID-19 pandemic impacted the actioning of the Master Plan. The World Health Organization declared COVID-19 a pandemic on March 11, 2020; public health measures became widespread in Canada in response. The Airport remained open and available for use with revised operational procedures without pause throughout the COVID-19 pandemic to support essential air services. However, widespread impacts were experienced on the Airport's activity levels, users, and revenues, as discussed throughout this document.

1.3. 2024 Airport Master Plan Update

The COVID-19 pandemic transformed and unprecedentedly affected the domestic and international aviation industries and fundamentally impacted the assumptions, analysis, and recommendations of the Master Plan. As the effects of the pandemic have decreased, the City is now positioned to reexamine the Airport amid a changed aviation industry, capitalize on new opportunities, and address emergent challenges such as the loss of scheduled passenger air services.

In May 2024, the City was awarded funding through the Province of Alberta's Regional Airport Development Grant to complete a Master Plan Update and Commercial Air Services Feasibility Study. Regarding the latter objective, the City retained HM Aero Aviation Consulting and ASM Global Route Development to assess the state of the scheduled passenger air service market, complete detailed research on post-pandemic regional demand, identify prospective opportunities for service restoration, and provide an implementation strategy.

The Master Plan Update has been developed in concert with the Commercial Air Services Feasibility Study with the following objectives:

- Evaluate the implementation of the Master Plan and the facility's activities between 2020 and 2024;
- Prepare an updated demand outlook considering the cessation of scheduled passenger services in 2024 and the evolution of the regional economy and aviation industry; and
- Provide updated recommendations on renewing and improving the Airport's infrastructure and services to meet demand.

The Master Plan Update encompasses a 20-year planning period across the following three horizons:

1. **Short Term:** 2025 to 2029;
2. **Medium Term:** 2030 to 2034; and
3. **Long Term:** 2035 to 2044.

The Master Plan Update is intended to replace the Master Plan as the City's primary long-term planning resource for the Airport.

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2. AIRPORT OVERVIEW

2.1. Catchment Area

The Airport directly serves Lloydminster's population of 31,582 residents (2021). Based on research commissioned by the City in 2022 as part of its Retail Gap Analysis, Lloydminster functions as a regional service centre for two trade areas with a total population of approximately 189,000 residents that together form its catchment area:

- **Primary Trade Area:** Lloydminster's Primary Trade Area encompasses numerous communities to the south, west, and north within a two-hour drive, including Bonnyville, Cold Lake, Innisfree, Macklin, St. Paul, and Wainwright. The population of the Primary Trade Area is 136,363 residents (2021); and
- **Secondary Trade Area:** The Secondary Trade Area extends east to the communities of Battleford, Meadow Lake, and Wilkie and has a population of 52,866 residents (2021).

Based on the City's 2023 Municipal Development Plan, Lloydminster is anticipated to grow by between 1.5% and 2.2% per year. Modest levels of annual growth are anticipated in the Primary and Secondary Trade Areas. While economic development and diversification are actively being pursued, Lloydminster's success is inextricably tied to the oil and gas sector. Lloydminster's largest employment industries are oil, gas, and innovative manufacturing, representing approximately 16% of the local workforce. Other major economic pillars include the retail, healthcare, and construction segments, which reflect the community's role as a regional service centre.

Demand for aviation services within the catchment area is fulfilled by Lloydminster Airport and numerous community and regional airports, such as those identified below, as well as smaller private aerodromes and military facilities:

- Bonnyville Regional Airport;
- Cold Lake Regional Airport;
- Elk Point Municipal Airport;
- Macklin Airport;
- Maidstone Airport;
- Meadow Lake Airport;
- North Battleford Airport;
- Provost Airport;
- St. Paul Municipal Airport;
- Unity Airport;
- Vermilion Municipal Airport; and
- Wainwright Airport.

Lloydminster is the sole Transport Canada certified facility serving the catchment area, provides the longest runway and highest level of year-round maintenance, and until 2024, was the only point of access through scheduled passenger air services in recent years. Scheduled air service demand within the catchment area has historically been met by Lloydminster Airport and three facilities located outside its boundaries:

- Edmonton International Airport captured an estimated 79% of demand for resident and visitor scheduled passenger air services within the Airport's 150 km surrounding area in 2023;
- Saskatoon International Airport captured 11% of demand; and
- Calgary International Airport captured 8% of demand.

2.2. Activity Levels

2.2.1. Airport Tenants

The Airport supports the following land lease and terminal building tenants:

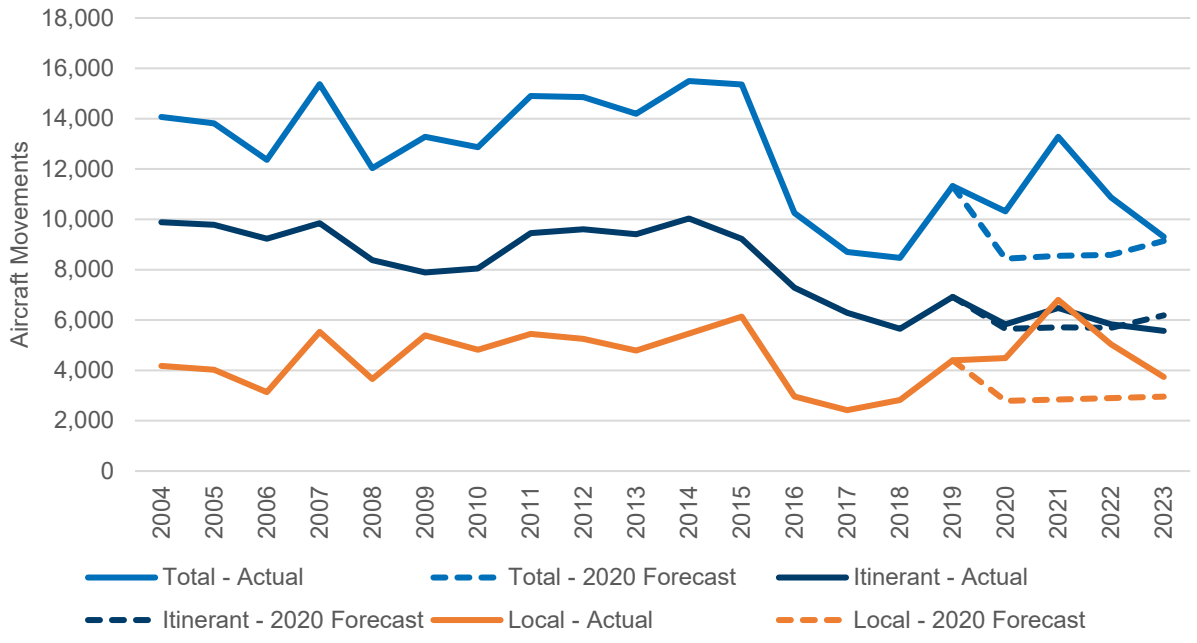
- **Border City Aviation** provides flight training, air taxi, aerial work, aircraft maintenance, and ground handling services. Border City Aviation leases two lots northwest of the terminal building on Taxiway C;
- **NAV CANADA** is Canada's non-profit air navigation service provider. NAV CANADA operates the Lloydminster Flight Services Station collocated with the terminal building and maintains on-site navigation and weather observation infrastructure; and
- **Paladin Airport Security Services** provides pre-board and hold baggage screening services on behalf of the Canadian Air Transport Security Authority (CATSA); and
- 13 hangars have been developed by **private tenants** located on Taxiways B and C.

2.2.2. Aircraft Movements

Statistics Canada aircraft movement data was retrieved for the period of 2004 to 2023 for the Airport. As shown in Figure 1:

- An average of approximately 14,000 aircraft movements were recorded annually between 2004 and 2015. Both itinerant and local aircraft movements were negatively affected by the 2008 recession before recovering between 2009 and 2011;
- A significant decrease in aircraft operations was experienced between 2016 and 2018 amid widespread challenges in the oil and gas sector. During this period, a low of between 8,000 and 9,000 movements were handled annually; and
- Activity increased to an average of 11,000 movements annually between 2019 and 2023, although decreases were experienced in 2022 and 2023.

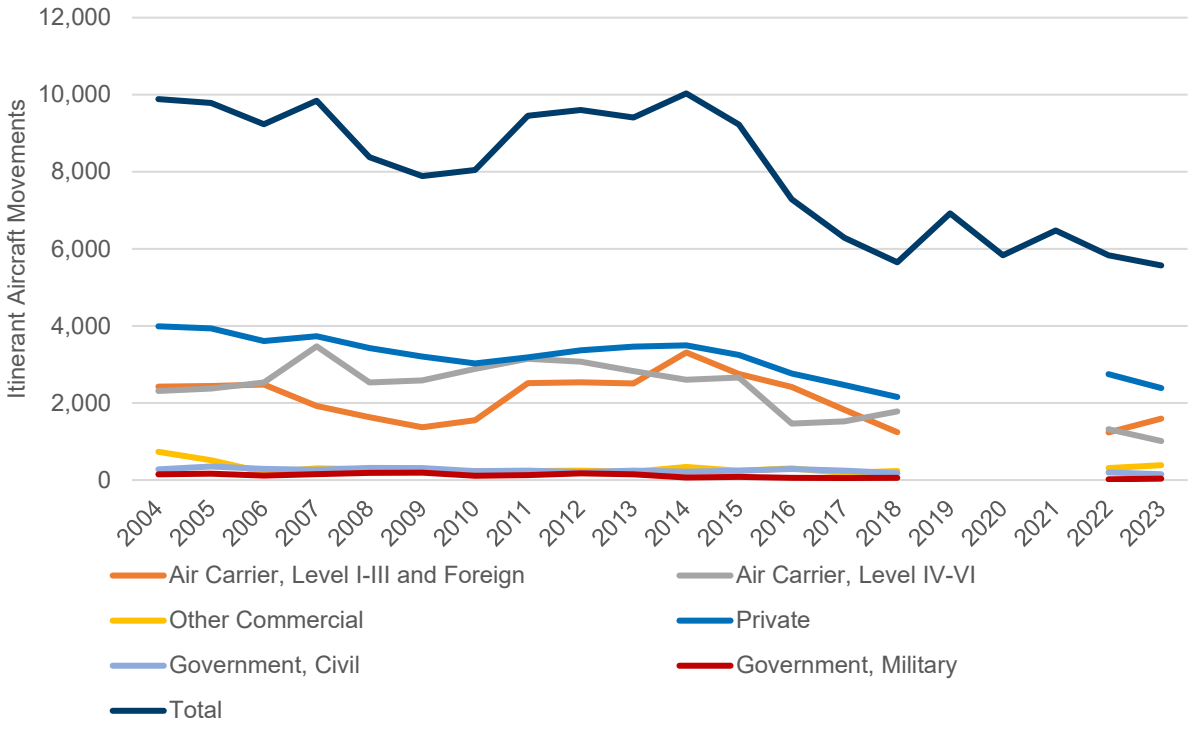
Figure 1 – Local and Itinerant Aircraft Movements, 2004-2023



As shown in Figure 1, activity at the Airport between 2019 and 2022 outperformed the forecasts of the Master Plan that used 2018 movement levels as a baseline. Higher than forecast local aircraft movements and stable itinerant activity supported this trend, despite the impacts of the COVID-19 pandemic. However, subsequent declines experienced in both segments have meant that movement levels in 2023 have nearly matched those forecast in the Master Plan.

Itinerant aircraft movement levels by operator type were reviewed, although data was unavailable from Statistics Canada for 2019, 2020, and 2021. As shown in Figure 2, private aircraft are the largest source of itinerant operations at the Airport, followed by air carrier movements. Itinerant movements in the other commercial, government civil, and government military categories represent a limited proportion of the Airport's overall traffic and are comparatively stable.

Figure 2 – Itinerant Aircraft Movements by Operator Type, 2004-2023



2.2.3. Passenger Air Services

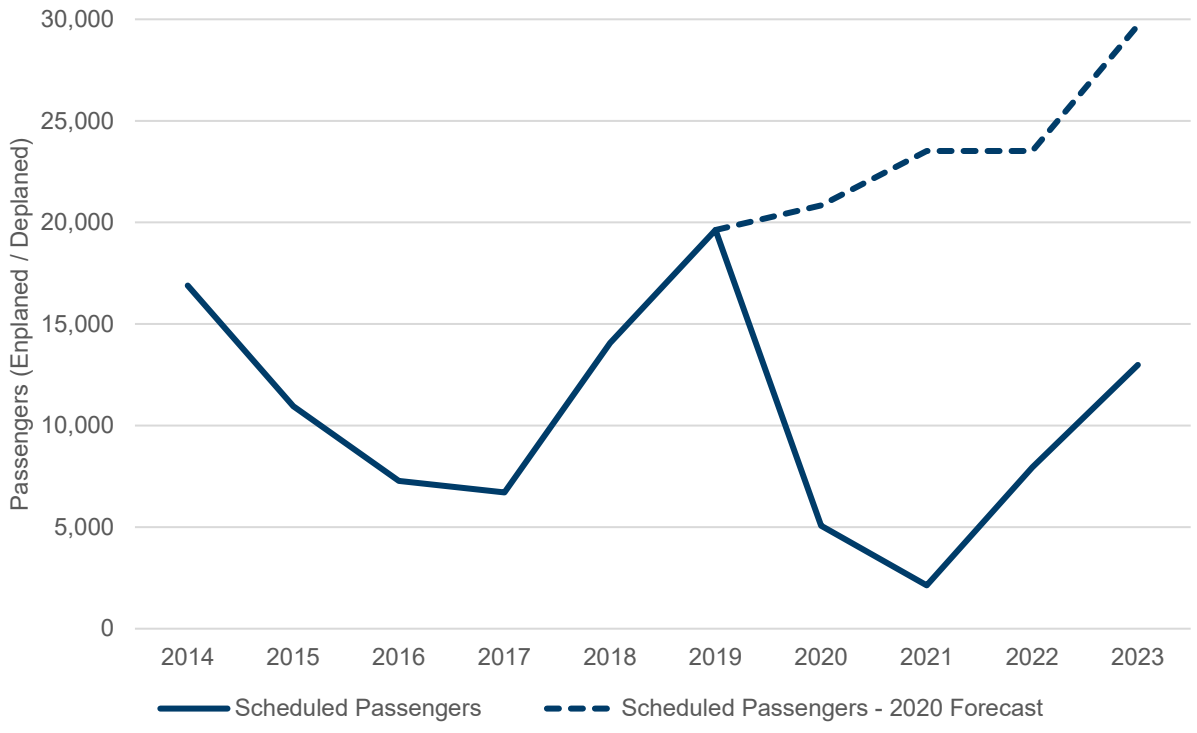
Scheduled Passenger Air Services

Scheduled passenger activity levels have undergone three main periods of change over the past 10 years (Figure 3):

- Activity declined from 17,000 passengers in 2014 to a low of 7,000 passengers in 2016 and 2017 amid the oil price-induced economic downturn. During this period, Central Mountain Air provided scheduled services to Calgary;
- In June 2018, WestJet commenced service to Lloydminster from Calgary as part of its WestJet Link Capacity Purchase Agreement with Pacific Coastal Airlines. Passenger activity grew significantly in 2018 (110% increase) and 2019 (40% increase). Close to 20,000 scheduled passengers were served in 2019, a record high since 1995. Central Mountain Air ended its scheduled services to Calgary in August 2018; and
- Due to the widespread impacts of the COVID-19 pandemic, scheduled passenger traffic decreased in 2020 to 5,000 passengers and in 2021 to 2,000 passengers. Recovery began in 2022, reaching 8,000 passengers, and in 2023, when 13,000 passengers were handled. Monthly passenger traffic in 2023 was improving consistently to near pre-pandemic levels until service frequencies were decreased in November and December and flight schedules were changed, limiting the convenience of connecting itineraries through Calgary.

Despite the positive recovery experienced in 2022 and 2023, WestJet permanently withdrew from Lloydminster in April 2024. At the time of the Master Plan Update's preparation, no air carriers were providing scheduled passenger air services to the Airport.

Figure 3 – Scheduled Passenger Activity, 2014-2023

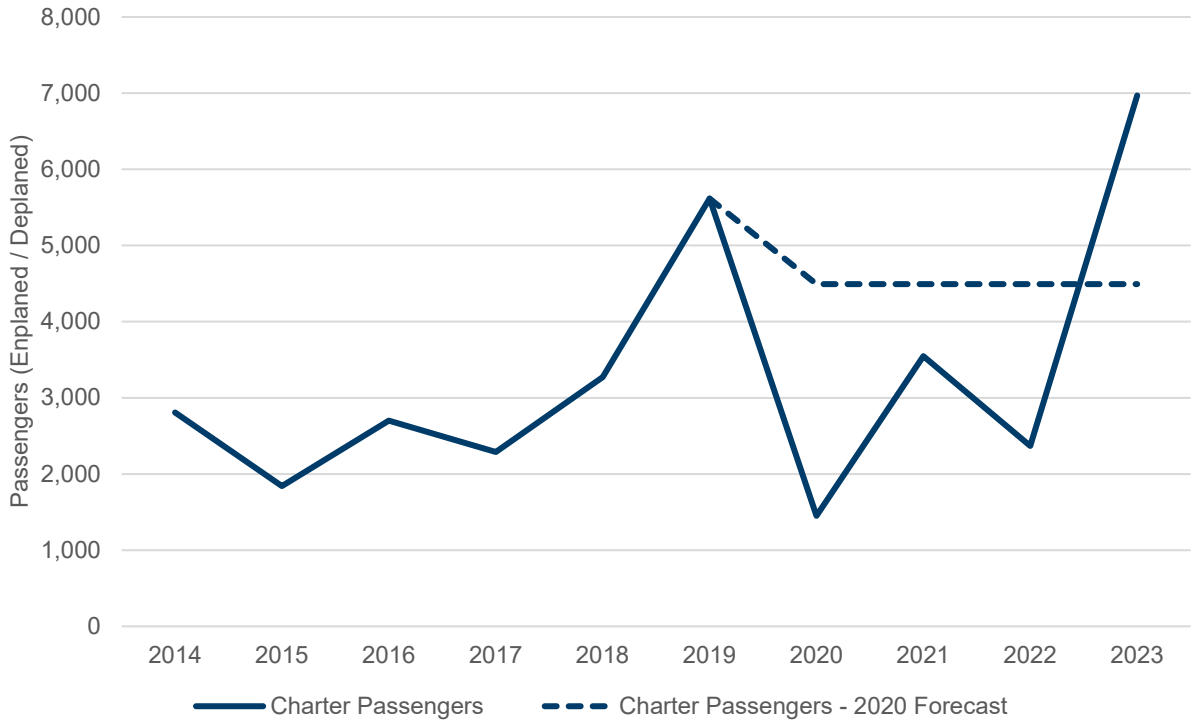


Charter Passenger Air Services

Husky Energy and, following its acquisition, Cenovus Energy regularly charter passenger air services to Lloydminster in support of their operations in the region. Prior to its acquisition, Husky Energy chartered Central Mountain Air to provide passenger services to Calgary, typically at a frequency of three weekly roundtrips using aircraft in the 18 to 37-seat range. Cenovus Energy now contracts its charter flying to Sunwest Aviation, typically on a frequency of two roundtrips per week or as required based on operations.

Charter passenger air services decreased in 2020 because of the COVID-19 pandemic; however, activity levels have subsequently increased to close to 7,000 annual passengers to meet the travel requirements of Cenovus, exceeding the forecasts of the Master Plan (Figure 4).

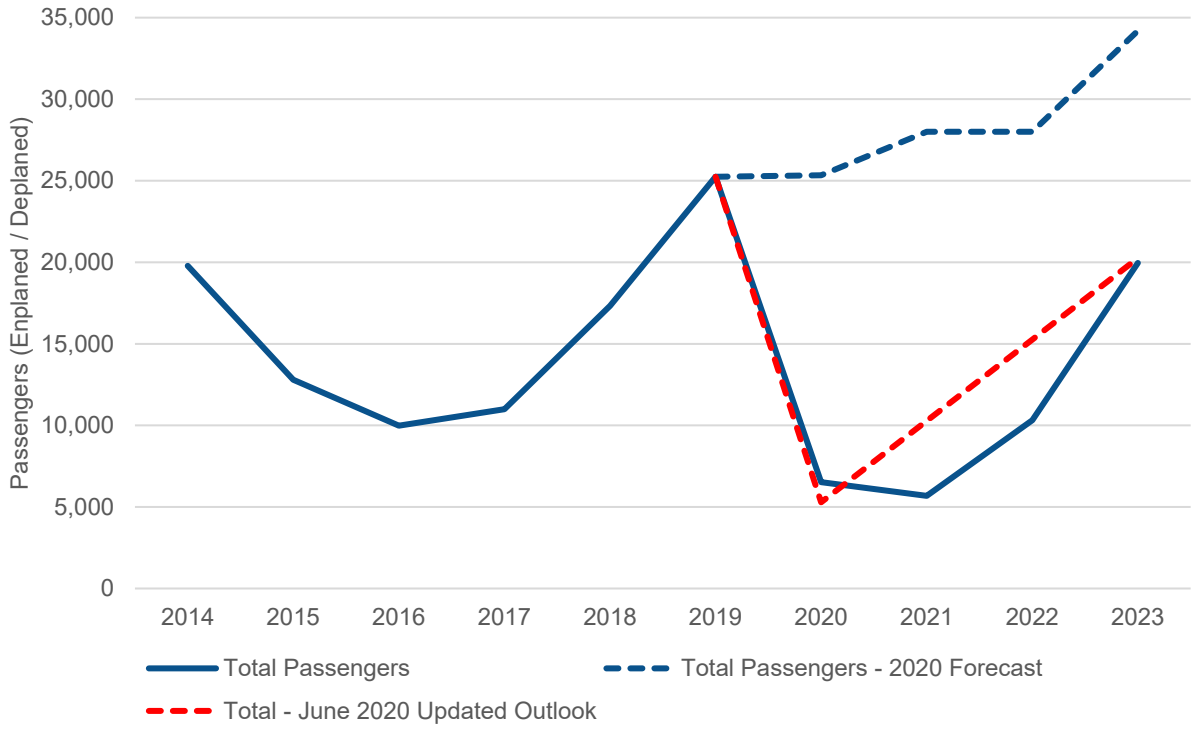
Figure 4 – Charter Passenger Activity, 2014-2023



Total Passenger Air Services

As shown in Figure 5, total passenger levels increased from a low of 10,000 passengers in 2016 to 25,000 passengers in 2019 – the highest level experienced since 1995 when this data became available. Based on this trajectory, the Master Plan forecasted further increases in activity to approximately 35,000 passengers in 2023. As noted previously, the COVID-19 pandemic impacted activity levels and the Master Plan's forecast. Activity levels between 2020 and 2023 have generally recovered in line with updated estimates prepared in June 2020 as part of the presentation of the Master Plan to City Council.

Figure 5 – Total Passenger Activity, 2014-2023



2.3. Regional Value

2.3.1. Economic Impacts

The Airport is a productive part of the region's economic infrastructure:

- **Business Productivity:** The Airport functions as part of the region's economic infrastructure, improving the ability for employers to do business by providing time-effective access by air for the movement of passengers and goods. Cenovus, one of the region's largest employers, routinely uses the Airport to transport employees between its headquarters in Calgary and operational facilities in Lloydminster. Several businesses also operate aircraft or charter air services on an as-required basis. The restoration of scheduled passenger air services is of particular importance for the productivity of employers with presences in Lloydminster and the surrounding region.
- **Tourism Access:** The Airport supports visitor access to the region and is particularly well-used during the waterfowl hunting season when increased numbers of American visitors arrive.
- **Economic Development Pursuits:** The Airport is marketed by the City's Economic Development Department and other entities as part of the economic infrastructure of the region. For businesses that require air services to sustain their operations, the Airport is an enabling factor that can assist in their retention and expansion decisions.
- **Flight Training:** Border City Aviation supports the continued sustainability of the Canadian aviation sector through its flight training courses, with training offered to the Commercial Pilots License level and associated ratings. Border City Aviation is the sole Flight Training Unit providing Commercial Pilots License courses serving the Primary Trade Area and one of two Flight Training Units in the catchment area providing these services.
- **Resident and Worker Attraction:** Through perspectives repeatedly shared during the preparation of the Commercial Air Services Feasibility Study, the availability of scheduled passenger air services is an important part of the community and region's attraction and retention of residents and workers by enabling time-effective access to the domestic and international air travel network.

As part of the Master Plan, a survey of Airport tenants and businesses was completed to collect economic data. As shown in Table 2, the Airport's 2019 economic impact included the support of 56 Full-Time Equivalent positions, labour earnings of approximately $2.9 million, and Gross Domestic Product contributions of $3.9 million across the following categories:

- **Direct:** Wages, expenses, and economic contributions of on-Airport businesses, tenants, and activities; for example, wages paid to flight instructors.
- **Indirect:** The wages and expenses added to the region by users of the Airport. For example, this may include passengers buying meals or hotel stays in Lloydminster.
- **Induced:** A "ripple effect" whereby the direct and indirect wages and expenditures on goods and services generate income for residents of Lloydminster. The residents spend a part of this income, thereby providing income to additional persons.

Table 2 - 2019 Tenant and Business Economic Impact Estimate

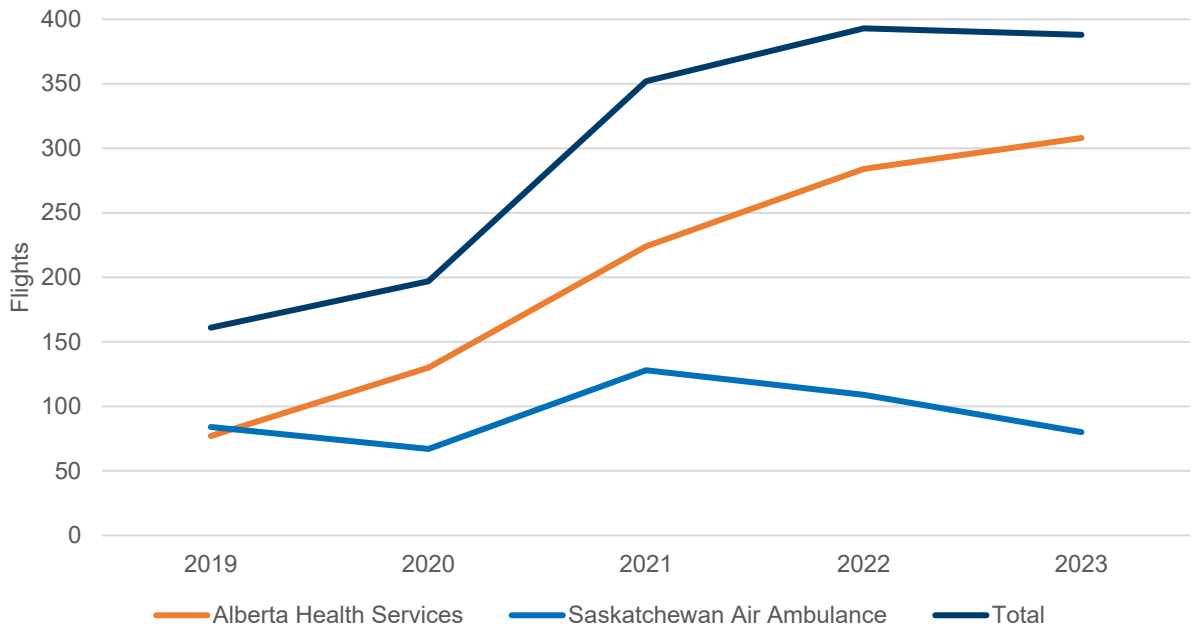
Metric	Direct	Indirect	Induced	Total
Full-Time Equivalent Positions	34	15	7	56
Labour Earnings	$1,971,409	$738,635	$234,519	$2,944,562
Gross Domestic Product	$2,496,827	$1,021,301	$424,224	$3,942,352

2.3.2. Air Ambulance Operations

Support for intercommunity critical care and patient transfer flights is a crucial social function of the Airport. Fixed-wing air ambulance services are provided by Alberta Health Services by private contractors and by Saskatchewan Air Ambulance using the Beechcraft King Air series of aircraft, enabling time-effective access to care over extended distances to medical facilities in metropolitan areas such as Edmonton and Saskatoon. Air ambulance patient transfer missions have increased between 2019 and 2023 as shown in Figure 6, reaching close to 400 annual missions in both 2022 and 2023. The Airport is available 24 hours per day, 365 days per year to support these missions and facilitate healthcare access.

STARS operates directly from the Lloydminster Hospital which is supported by an on-site certified heliport. The Airport is used by STARS for the refuelling of its helicopters on an as-required basis during extended range scene response and interfacility patient transfer missions, improving the organization's operational capabilities in the region.

Figure 6 – Air Ambulance Patient Transfer Flights, 2019-2023



2.3.3. Emergency Management

The Airport is not part of Alberta Wildfire's network of primary and secondary air tanker bases. However, the facility can support the refuelling of suppression and observation aircraft engaged in nearby operations. Lloydminster also supports occasional flights by the Royal Canadian Mounted Police Air Services Branch, which provides airborne law enforcement services.

3. AIRPORT ECONOMIC DEVELOPMENT

3.1. Overview

The City has a vested interest in pursuing growth and development at the Airport and ensuring that the conditions are in place for the continued success of its existing users and tenants. The City's 2018-2021 Economic Development Strategic Plan establishes four goals to support economic prosperity for Lloydminster and the surrounding region, including achieving the optimal use of the Airport. Objectives under this goal include:

- Pursuing a range of partnerships;
- Initiating a regional aerotropolis feasibility study and plan;
- Capitalizing on commercial air services;
- Ensuring a quality experience for travellers;
- Expanding commercial activity surrounding the Airport; and
- Encouraging business investment and development.

By supporting the Airport's current users and tenants and attracting new and expanded forms of activity:

- Operating revenues will be generated that contribute to the facility's financial sustainability;
- Economic benefits will be realized, such as additional employment, improved supports for businesses, and economic resiliency through diversification;
- Social value for Lloydminster's residents may be achieved; and
- The highest and best use of available infrastructure and services can be demonstrated.

The Master Plan Update approaches economic development through the following goals:

1. Supporting current tenants and users;
2. Pursuing expanded and new forms of activity; and
3. Preserving flexibility for future opportunities.

3.2. Economic Development Outlook

3.2.1. Restoration of Scheduled Passenger Air Services

WestJet provided scheduled passenger air services between Lloydminster and Calgary beginning on June 21, 2018, with the final flight operated on April 15, 2024. By providing access to hub connectivity in Calgary to domestic and international destinations, WestJet stimulated the regional air service market compared to the previous offerings of Central Mountain Air, which primarily served origin and destination business travel demand between Calgary and Lloydminster.

The restoration of scheduled passenger air connectivity is a priority for businesses and residents of the region, the City, and its partners. Since the time of the Master Plan's preparation, the Canadian air service market has undergone a considerable period of evolution:

- WestJet terminated its WestJet Link regional services in October 2024 and consolidated operations to WestJet Encore, using the 78-seat Dash 8-400. Former WestJet Link markets, such as Cranbrook, Lethbridge, and Medicine Hat, have had their service transitioned to WestJet Encore at reduced daily frequencies. Based on a strategic shift that began in late 2022, WestJet has focussed on building its network strength in western Canada, including the growth of its primary hub in Calgary and the reduction of services in eastern Canada; renewing its focus on leisure travel, supported by the acquisition of Sunwing Airlines; and cancelling its remaining deliveries for the Boeing 787-9 and focussing long-haul operations in Calgary;
- Air Canada has ceased Air Canada Express flying in the sub-50 seat range, simplifying its operations in western Canada to the 76-seat CRJ-900 and 78-seat Dash 8-400. Air Canada has increased capacity at its primary hubs (Vancouver, Toronto, and Montreal) and decreased its regional operations to Alberta and Saskatchewan from Calgary, now limited to low-frequency services to Fort McMurray and Grande Prairie. Regional service from Calgary has been withdrawn from markets such as Lethbridge, Medicine Hat, Red Deer, Regina, and Saskatoon, with the latter two markets served from Air Canada's other hubs;
- Toronto-based Porter Airlines has added the Embraer E195-E2 to its fleet to begin longer routes throughout Canada and the United States, departing from its historical focus of regional operations using the Dash 8-400. To date, the Embraer fleet has been deployed in western Canada to provide domestic connectivity to markets in Ontario and Quebec, such as Montreal, Ottawa, and Toronto;
- In the Low-Cost / Ultra Low-Cost Carrier market space:
    - Flair Airlines commenced scheduled services in 2017, has grown to a fleet of 20 aircraft, and is providing service in all 10 provinces and internationally. The carrier has encountered challenges recently, including investigations into its ownership structure and aircraft seizures over alleged payment issues. Operations continue and in July 2024 a record 494,000 passengers travelled with Flair Airlines;
    - Swoop commenced operations in June 2018. Operations were consolidated with its parent company, WestJet, beginning in 2023. Swoop no longer operates as a distinct carrier from WestJet;
    - Calgary-based Lynx Air commenced operations in April 2022 and entered creditor protection in February 2024, permanently ceasing operations; and
    - Canada Jetlines commenced service in September 2022. The company's route structure and overall commercial strategy evolved between 2022 and 2024, and in August 2024, Canada Jetlines entered creditor protection and ceased operations.
- Operations by independent regional airlines in western Canada, such as Central Mountain Air, Northwestern Air Lease, Pacific Coastal Airlines, and Rise Air, have evolved with route additions and terminations.

Despite the loss of WestJet, demand for air services in the catchment area remains high and is recovering from the COVID-19 pandemic. In 2019, the 150 km area around the Airport generated approximately 781,000 annual passengers, and in 2023 traffic recovered to 657,000 passengers. The City's framework for pursuing the restoration of scheduled passenger air services is provided under separate cover through the Commercial Air Services Feasibility Study completed in 2024. The City and its partners will advance air service development efforts in parallel with implementing the Master Plan Update.

The Master Plan Update has been prepared at a time when the form that restored scheduled passenger air services will take is uncertain. Additionally, it is not known when services will return. The restoration of scheduled passenger air services will be influenced by:

- The success of air service development efforts being completed by the City and regional partners;
- Staffing challenges being experienced by regional air carriers, compounded by insufficient professional pilot generation, workforce reductions during the COVID-19 pandemic, and regulatory changes to flight duty time requirements that have required airlines to increase their staffing to maintain their schedules;
- The shift in regional air service networks by major carriers such as Air Canada and WestJet through the concentration of operations to aircraft in the 78-seat range, such as the Dash 8-400; and
- Passenger leakage to Edmonton International Airport, Saskatoon International Airport, and Calgary International Airport.

In response to this uncertainty, the Master Plan Update takes a flexible, trigger-based approach to assigning infrastructure and service improvement recommendations to support the restoration of scheduled passenger air services, as described in the following sections. Four scenarios are contemplated in the Master Plan Update to guide the assessment of the Airport's infrastructure and supporting services (Table 3). The scenarios presented are intended to provide flexibility in the City's response to the needs of potential air carriers; actual requirements will be determined through negotiations with prospective operators.

Table 3 - Master Plan Update Air Service Planning Scenarios

Air Service Planning Scenario	Description	Planning Aircraft
1 – Hub Connectivity, Network	Service by a network air carrier to a hub airport with onward connectivity. CATSA screens flights in Lloydminster to permit secure onward connections at the hub airport.	Dash 8-400 – 78 passengers
2 – Hub Connectivity, Regional	Service by an independent regional air carrier to a hub airport with onward interline or codeshare connectivity. CATSA screens flights in Lloydminster to permit secure onward connections at the hub airport.	Dash 8-300 – 50 passengers Saab 340 – 34 passengers Beechcraft 1900 – 18 passengers
3 – Regional Point-to-Point Service	Service by an independent regional air carrier providing point-to-point connectivity focused on origin and destination passengers. Flights depart Lloydminster without CATSA screening and arrive at the destination unsecured.	Dash 8-300 – 50 passengers Saab 340 – 34 passengers Beechcraft 1900 – 18 passengers
4 – No Restoration of Service	Scheduled passenger air services are not restored to Lloydminster and the Airport continues to support its current primary users.	N/A

3.2.2. Corporate, Charter, and Private Air Services

Charter air services for Cenovus Energy have increased to a 10-year high of nearly 7,000 annual passengers. Ongoing significant projects in the region by Cenovus, such as the mid-2024 upgrader turnaround, are expected to continue to result in higher charter passenger volumes. Business-related corporate and charter activity levels are a derived demand tied to the broader requirements of employers based in, or with travel requirements in, the region. As evidenced by the increases and decreases in aircraft movements and passenger activity levels with periods of economic strength and weakness, fluctuations in these market segments should be anticipated throughout the Master Plan Update's 20-year period. While activity levels may vary, the City's continued provision of the requisite infrastructure and services at the Airport will ensure that this derived demand can be met over time.

Similarly, the Airport's use by private and chartered aircraft arriving for tourism and discretionary purposes is tied to factors such as the region's visitor attractions (e.g., waterfowl hunting, major events) and personal reasons for travel. Apart from occasional use for aviation-specific events such as the Alberta Air Tour, the Airport functions as a gateway to facilitate visitor access requirements based on their predefined need to travel to the region. By providing services that align with the needs of these visitors, the Airport can improve its success in securing this traffic and contributing as an overall gateway to Lloydminster and the region.

3.2.3. Flight Training

Lloydminster has a longstanding history of supporting professional pilot training, with such services currently provided by Border City Aviation. The Airport is also used on an itinerant basis by Flight Training Units operating from other airports as part of student pilot cross-country training requirements. From a flight training perspective, the Airport benefits from favourable weather conditions, nighttime availability, Instrument Approach Procedures, adequate runway length, and on-site support services. Nationally, there is an increasing demand for new commercial pilots to support industry growth and replace pilots exiting the workforce. Supporting the success of the incumbent Flight Training Unit and itinerant operators will ensure the future of this economic role in Lloydminster. Lands and residual airfield and airspace capacity are available to support the attraction of one or more additional Flight Training Units to the Airport.

3.2.4. Airside Land Development

A total of 51 airside lots with sizes between 750 m^2 and 3,600 m^2 have been prepared at the Airport, of which 32 are available for lease as of 2024. Three types of lots are available in the Western and Eastern Development Areas:

- Small lots that are suitable for single aircraft hangars (750 to 1,000 m^2);
- Medium lots that can support hangars for multiple aircraft and small aviation businesses (1,000 to 2,000 m^2); and
- Large lots for businesses such as Fixed-Base Operators, Aircraft Maintenance and Repair Organizations, and air carriers (over 2,000 m^2).

The Master Plan was prepared following a period of increased airside lot absorption in the preceding 10-year period. No new airside land development has occurred since the preparation of the Master Plan. A broad spectrum of end users may be interested in airside land development at the Airport, such as

- Private and corporate aircraft hangars;
- Aerial work and air taxi operators;
- Air carriers;
- Flight Training Units; and
- Aviation support businesses, such as Approved Maintenance Organizations, avionics suppliers, Fixed-Base Operators, and specialty businesses.

Based on the leasehold lots available as of 2024, sufficient lands are expected to be available to support demand through the short, medium, and potentially long-term planning horizons pending the extension of Taxiway B and supporting roadway access in the Eastern Development Area.

3.2.5. Groundside Land Development

The City's Municipal Development Plan, through its Future Land Use Concept, allocates space for future industrial development throughout Lloydminster. Most of Lloydminster's industrial land is in its northwest corner, close to the Airport. Future industrial development is foreseen in the City's northeast and northwest quadrants, per the Northeast and the Hill Industrial Area Structure Plans. Industrial and commercial mixed-use growth is foreseen immediately to the east of the Airport across 75 Avenue on lands annexed by the City in 2022.

Sufficient industrial and mixed-use land is designated through the Municipal Development Plan and Area Structure Plans to accommodate demand for the foreseeable future. Surplus land located in the Airport's northeast quadrant at the intersection of Range Road 12 and Township Road 502A represents a candidate location for further development of this type, pending the City's identification of the need for further areas for growth. A comprehensive assessment of market demand and detailed planning will be required to assess the timing and suitability of bringing these lands online for absorption, either through leasing or purchase. Alternative land-intensive non-aviation uses may also be considered at the Airport, such as laydown and storage yards and photovoltaic power generation.

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4. AIRPORT REQUIREMENTS AND DEVELOPMENT PLAN

4.1. Airside Movement Area

The Airport's site plan is shown in Figure 7.

4.1.1. Critical Aircraft

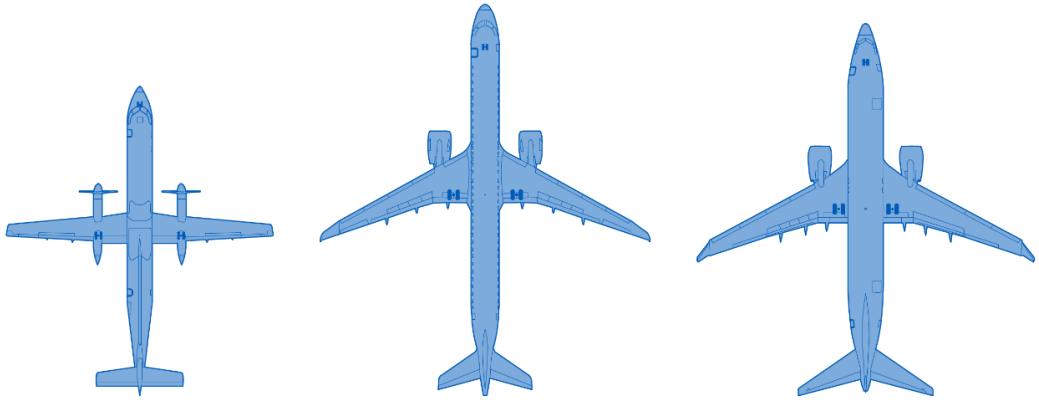
The Critical Aircraft is the aircraft that has the most demanding operational requirements with respect to the determination of runway, taxiway, and apron dimensions, as well as other physical characteristics at the Airport. Two Critical Aircraft classifications are used in the Master Plan Update:

1. **Critical Aircraft – Planning:** The aircraft assessed as being the most likely future user of the Airport based on historical and foreseen air service demand and the operational evolution of comparable regional airports. Deficiencies requiring resolution to support operations by the Critical Aircraft – Planning are accompanied by a recommendation, cost, and implementation period; and
2. **Critical Aircraft – Protection:** More operationally demanding aircraft with a lower likelihood of being deployed at the Airport on a routine basis, but that could make use of the facility on a recurring basis in the event of significant increases in scheduled passenger air service demand. Deficiencies are noted but are not accompanied by a recommendation for resolution, and the planning approach is focused on ensuring flexibility to accommodate potential demand.

Primary Airfield Infrastructure

The most operationally demanding aircraft using the Airport's primary airfield infrastructure (Runway 08-26, Taxiway A, Apron I, and associated facilities) have historically been turboprop aircraft operated as part of regional scheduled and charter passenger air services and larger corporate turbofan aircraft. The Master Plan identified the De Havilland Canada Dash 8-400 as the Critical Aircraft for planning purposes. This approach was based on regional aircraft fleet ages, the availability of replacement aircraft in the 18 to 50-seat range, and the shift in operating economics favouring larger aircraft. The Master Plan Update carries forward the Dash 8-400 as the Critical Aircraft – Planning.

The Master Plan Update introduces two additional aircraft types for consideration: the Embraer E195-E2 and Boeing 737 MAX 8. These aircraft types have not been operated at the Airport historically and service is not anticipated within a defined planning horizon. However, there is value in protecting for future operations by these aircraft to accommodate longer-range domestic air service if the market evolves in favour of such operations. Applicable planning specifications of the three Critical Aircraft are provided in Table 4.



DEHAVILLAND DHC 8-400
78 SEATS

EMBRAER E195-E2
132 SEATS

BOEING 737 MAX 8
189 SEATS

Table 4 - Critical Aircraft, Primary Airfield Infrastructure

Specifications		Critical Aircraft – Planning	Critical Aircraft – Protection	
Aircraft Type		De Havilland Canada Dash 8-400	Embraer E195-E2	Boeing 737 MAX 8
Passengers		78	132	189
Wingspan		28.4 m	35.1 m	35.9 m
Length		32.9 m	41.6 m	39.5 m
Aircraft Group Number (AGN)	Runway	IIIB	IIIB	IIIB
	Taxiway	IIIA	IIIB	IIIB
Aircraft Load Rating (ALR)		6.4	8.9 (E195)	10.7 (737-800)
Outer Main Gear Wheel Span (OMGWS)		9.6 m	8.0 m	7.0 m

Secondary Airfield Infrastructure

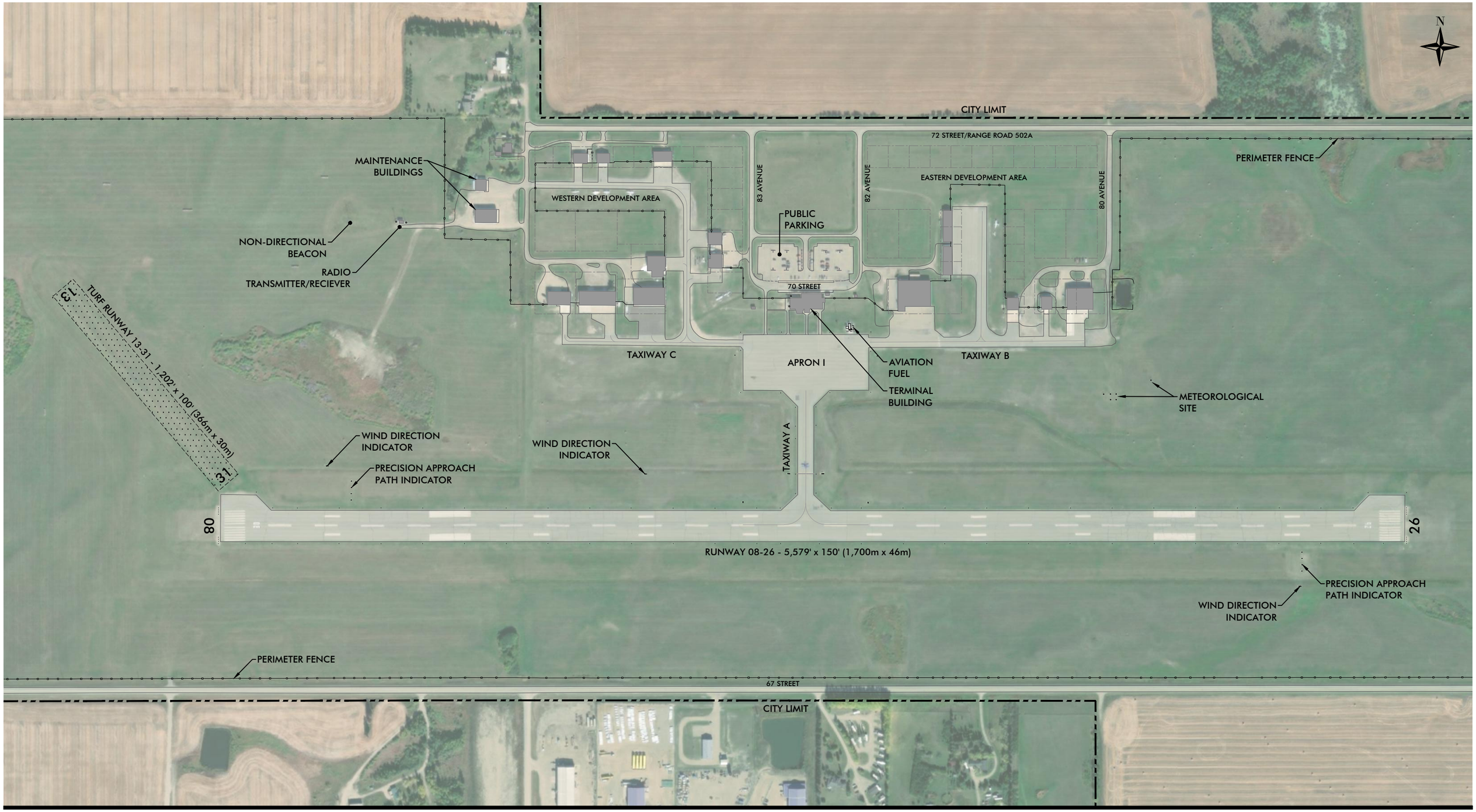
Runway 13-31 is the Airport's secondary runway, with operations limited to smaller single-engine general aviation and flight training aircraft. The Critical Aircraft – Planning / Protection for Runway 13-31 is the Cessna 182.

Taxiways B and C serve the Western and Eastern Development Areas and are used by a range of piston, turboprop, and turbofan single and twin-engine general aviation, flight training, and corporate aircraft. These facilities should be protected to AGN II standards to accommodate operations up to twin-engine turboprop and turbofan aircraft, such as the Beechcraft King Air 350, Cessna Citation, etc.

Planning specifications of the two Critical Aircraft are provided in Table 5.

Table 5 - Critical Aircraft, Secondary Airfield Infrastructure

Specifications		Critical Aircraft – Planning / Protection	
Airfield Area		Runway 13-31	Taxiways B and C
Aircraft Type		Cessna 182	Beechcraft King Air 350
Wingspan		11.0 m	17.6 m
Length		8.8 m	14.2 m
Aircraft Group Number (AGN)	Runway	I	N/A
	Taxiway	N/A	II
Aircraft Load Rating (ALR)		1.0	2.7
Outer Main Gear Wheel Span (OMGWS)		9.6 m	5.8 m



LLOYDMINSTER

LLOYDMINSTER AIRPORT

LLOYDMINSTER AIRPORT
MASTER PLAN UPDATE

FIGURE 7
CURRENT SITE PLAN

0 100 200
Meters

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4.1.2. Runways

Table 6 - Runway Specifications

Specifications	Runway 08-26	Runway 13-31
Length	1,701 m	366 m
Width	45 m	31 m
TP312 4th Edition Certification	3C Non-Precision	1A Non-Instrument
TP312 5th Edition Equivalency	AGN IIIB Non-Precision	AGN I Non-Instrument
Surface Type	Asphalt	Turf
Pavement Load Rating (PLR)	7.0	Not Reported
Condition	Good	Fair

Runway 08-26

Bearing Strength

Runway 08-26 has a declared PLR of 7.0, which is suitable for the ALR of the Critical Aircraft – Planning (Dash 8-400, ALR of 6.4). The need to increase the bearing strength of Runway 08-26 to meet the requirements of the Critical Aircraft – Planning has not been identified.

The PLR is exceeded by the ALR of both the Embraer E195-E2 and Boeing 737 MAX 8. While operations by aircraft exceeding the PLR have occurred with specific authorization by the City in the past, the bearing strength of Runway 08-26 may not be suitable for widespread operations by these aircraft in the future (e.g., in routine scheduled passenger air services). The overloading of pavements can shorten the useful service life and cause accelerated asset deterioration. As routine operations by the Critical Aircraft – Protection are not foreseen within the horizons of the Master Plan Update, a recommendation has not been made for the bearing strength of Runway 08-26 to be increased. PLR testing is recommended in the short-term planning horizon to confirm the bearing strength of the airfield pavements.

Length

The Critical Aircraft – Planning for Runway 08-26 is the Dash 8-400. At Maximum Takeoff Weight, flaps set at 15, and assuming an uncontaminated runway, no wind, and a 30-degree Celsius day, the Dash 8-400 takeoff field length is approximately 1,646 m. At Maximum Landing Weight, flaps set at 10, and assuming an uncontaminated runway, the landing distance is approximately 1,280 m. Consultations with a representative regional air carrier operating the Dash 8-400 identified that 1,524 m is the minimum operating length for their operations in normal conditions. Based on the foregoing, the need to extend Runway 08-26 has not been identified based on the Critical Aircraft – Planning.

The City has acquired lands west of the Runway 08 threshold and implemented land use protections to allow for the potential extension of Runway 08-28 to a total length of 2,591 m. Detailed performance calculations have not been completed for the two Critical Aircraft – Protection to determine their runway length requirements. Based on the efforts that have been taken to-date to maximize the future flexibility of the City in developing airfield infrastructure that meets the needs of prospective users, the Master Plan Update continues to reserve suitable lands for this potential extension. As noted previously, extending Runway 08-26 to support operations by either of the Critical Aircraft – Protection would need to be accompanied by improvements to the existing runway to increase its bearing strength.

Width

The width of Runway 08-26 is suitable for the OMGWS of both the Critical Aircraft – Planning and Critical Aircraft – Protection per TP312 – Aerodrome Standards and Recommended Practices (5th Edition) and can accommodate aircraft with OMGWS of up to 15 m. The need to widen the runway has not been identified.

Condition

Runway 08-26 was rehabilitated in the summer of 2019, with the scope of work consisting of localized crack repairs and a pavement overlay. Five years after its rehabilitation, the runway is observed to be in good condition. It has been maintained annually through the City's asset maintenance program with crack sealing, localized repairs, and line painting. Deterioration is limited to longitudinal seams that have developed along select paving lanes and isolated transverse cracking, potentially including pre-construction cracks that have propagated through the overlay.

Based on an assumed useful service life of 20 years for asphalt runway pavements and continued asset maintenance, rehabilitation is next anticipated to be required in the long-term planning horizon. The scope of this rehabilitation will be determined through a comprehensive geotechnical engineering assessment.

Runway 13-31

Runway 13-31 is comprised of a turf surface and functions as the Airport's secondary runway. Runway 13-31 is not maintained in the winter and was reported to be in fair condition, with an irregular surface and holes caused by wildlife.

Runway 13-31 is used on a limited basis and is primarily chosen by general aviation aircraft operators when crosswind conditions preclude the use of Runway 08-26; the availability of the runway therefore contributes to overall availability levels and aviation safety. A surface winds analysis completed for Runway 13-31 during the preparation of the Master Plan found that it has an annual availability of 98% for aircraft with a maximum demonstrated crosswind of 15 knots (i.e., the Critical Aircraft – Planning for Runway 13-31). As Runway 08-26 and 13-31 function as one system, annual Airport availability is 99.8% for aircraft able to use either runway with a 15-knot crosswind limitation, exceeding the Transport Canada recommended minimum of 95%.

If a parallel taxiway is developed to the Runway 08 threshold or further west, the relocation of Runway 13-31 and concurrent extension to 1,700 ft. and realignment 10 to 20 degrees to the northeast is recommended to maximize its operational value.

Recommendation	Planning Horizon	Cost Estimate
Airfield Pavement Load Rating Testing	Short-Term	$20,000
Runway 08-26 Rehabilitation	Long-Term	$6,480,000
Runway 13-31 Relocation and Extension	Trigger-Based	$450,000

4.1.3. Taxiways

The taxiway system (Table 7) facilitates the movement of aircraft and vehicles between Apron I; Runways 08-26 and 13-31; and the Eastern and Western Development Areas.

Table 7 - Taxiway Specifications

Specifications	Taxiway A	Taxiway B	Taxiway C
Width	23 m	15 m	Varies: 7 m to 8 m
TP312 4th Edition Certification	C	C	C
TP312 5th Edition Equivalency	III	III	III
Surface	Asphalt	Asphalt	Asphalt
Pavement Load Rating (PLR)	7.0	Not Reported	Not Reported
Condition	Good	Good	Good

Taxiway A

Taxiway A is the primary taxiway and connects the midpoint of Runway 08-26 with Apron I. The width of Taxiway A is suitable for the Critical Aircraft – Planning and Protection, and no expansion is warranted.

As with the assessment of the bearing strength of Runway 08-26, the PLR of Taxiway A is suitable for routine operations by the Critical Aircraft – Planning. Occasional operations by aircraft with greater ALRs may be supported with prior authorization from the City; however, the taxiway's bearing strength may require improvement to support sustained operations by the Critical Aircraft – Protection or aircraft with similar ALRs. Taxiway A was rehabilitated in 2019 through a pavement overlay and is in very good condition, with limited evidence of deterioration. Rehabilitation is next anticipated to be required in the long-term planning horizon.

Taxiway B

Taxiway B extends from Apron I to serve the Eastern Development Area. The width of Taxiway B is suitable for the Critical Aircraft – Planning for this area (Beechcraft King Air 350) and widening or further improvements are not warranted. The PLR is not declared for Taxiway B, but its historical operations by aircraft such as the Beechcraft King Air and 1900 without any evidence of deterioration suggests that this facility may have sufficient bearing strength for the Critical Aircraft – Planning.

Taxiway B is paved with an asphalt surface and several rehabilitation and improvement projects have been completed since 2017. The comprehensive rehabilitation of Taxiway B is next anticipated to be required in the long-term planning horizon, depending on the observed deterioration of the asset. Given its more limited loading relative to other airfield infrastructure elements, rehabilitation timelines may exceed the typical 20-year useful service life.

Taxiway C

Taxiway C provides access to the Western Development Area from Apron I and varies in width between 7 m and 8 m. The width of Taxiway C is insufficient relative to TP312 5th Edition standards for the OMGWS of the Critical Aircraft – Planning. However, given the limited number of tenants in the Western Development Area with aircraft in this class and the availability of residual development lands with improved access via Taxiway B in the Eastern Development Area, widening is not recommended.

Taxiway C is paved with an asphalt surface and has undergone annual improvement projects since 2017. Rehabilitation is next anticipated to be required in the long-term planning horizon.

Airfield Capacity and Circulation

Airfield capacity considers the number of aircraft movements that can be safely accommodated in a given period based on the configuration of the runway, taxiway, and apron environment. From an airfield capacity and circulation perspective, the following observations are made:

- Aircraft must use Taxiway A to transit between Runways 08-26 and 13-31; Apron I; and the Eastern and Western Development Areas. This introduces conflicts between arriving and departing aircraft;
- Apron I functions as both an apron and as a taxilane between Taxiways A, B, and C. Accommodating for this circulation limits the overall utility of Apron I for aircraft parking and servicing and funnels an increased number of taxiing aircraft through this area; and
- The requirement for aircraft to backtrack to and from the Runway 08 and 26 thresholds increases runway occupancy times and decreases capacity.

These constraints result in limited duration delays on a recurring basis (e.g., daily or greater). Stakeholder consultations completed as part of both the Master Plan and the Master Plan Update confirmed this condition. While these delays do not significantly impact the Airport's overall level of service, increasing traffic activity that may occur throughout the horizons of the Master Plan Update may result in increased conflicts and impacts to circulation, potentially introducing safety issues and capacity limitations.

A high-level assessment completed as part of the Master Plan estimated that the capacity of the airfield is approximately 46 movements per hour in its current configuration. By constructing a partial-length parallel taxiway to the Runway 26 threshold, capacity would increase to an estimated 59 movements per hour, exceeding the long-term peak hour movement forecasting completed as part of the Master Plan. Ongoing monitoring and engagement with both NAV CANADA and the Airport's primary aircraft operators is recommended to assess peak-hour aircraft movement levels and the facility's level of service from a circulation and capacity perspective. The development of the partial-length parallel taxiway may be warranted based on evolving conditions.

Concurrent with the potential development of a partial-length parallel taxiway in the future, it is recommended that Taxiways B and C be extended and rerouted away from Apron I to connect directly with the parallel taxiway. This step will address the challenges noted with Apron I below.

Recommendation	Planning Horizon	Cost Estimate
Taxiway A Rehabilitation	Long-Term	$630,000
Taxiway C Rehabilitation	Long-Term	$880,000
Taxiway B Rehabilitation	Long-Term	$1,000,000
Taxiway B Northern Extension	Trigger-Based	$930,000
Partial Length Parallel Taxiway and Extension of Taxiways B and C	Trigger-Based	$5,790,000

4.1.4. Apron

Apron I supports a range of aircraft activities, including scheduled and charter passenger aircraft requiring access to the terminal building, air ambulance operations, itinerant aircraft parking, and aircraft fuelling. Apron I is also a taxiing route for aircraft transiting between Taxiways A, B, and C. The functionality of Apron I is limited by the following:

- Access between Apron I and Taxiway B is routinely impacted when larger aircraft are parked at the aviation fuelling facility at the northeast corner. Access to Taxiway B can be limited or aircraft wingtip clearances reduced for extended periods during fuelling;
- The Dash 8-400 (Critical Aircraft – Planning) exceeds the size of aircraft that historically have been the primary users of Apron I, such as the Saab 340, Dornier 328, and Dash 8-300. Operations by the Critical Aircraft – Planning will impact larger portions of the apron and clearances;
- Other than a protected area for scheduled carriers that is not suitable for the Dash 8-400, no parking positions have been delineated. This results in operators and ground crew having to assess aircraft clearances on a case-by-case basis and can lead to the inefficient use of limited apron space; and
- Peak parking demand is typically reached during the fall hunting season when four to six corporate turbofan aircraft remain on-site for multiple days. During these periods, Airport Staff have encountered challenges accommodating parking demand without encumbering ongoing operations and aircraft accessing Taxiways B and C.

A two-part approach is recommended to address the capacity limitations of Apron I:

1. In the short-term planning horizon, it is recommended that the Apron Management Plan be implemented (Figure 9). The Apron Management Plan provides interim improvements in operational safety and flows by demarcating appropriate aircraft parking and taxiing areas. The configuration proposed through the Apron Management Plan permits the simultaneous independent power-in, power-out operations by two Dash 8-400s to the south of the terminal building, with these stands intended for scheduled and charter passenger air carriers. Apron taxilanes are delineated for aircraft transiting to Taxiways B and C, and itinerant aircraft areas are provided that permit the simultaneous parking of up to four representative corporate turbofan aircraft. Fuelling services continue to be provided from the current facility, and the easternmost air carrier position can refuel without relocating.

   Concurrent with this initiative, the addition of a paved area for ground support equipment parking north of Apron I and the improvement of the vehicle access to the western edge of the terminal building is recommended. The relocation of one ground power position to the west is required.

2. The expansion of Apron I to the east is recommended to provide additional itinerant aircraft parking capacity and to act as a bypass around the fuelling facility to Taxiway B. This initiative will improve aircraft circulation until the potential implementation of a partial-length parallel taxiway.

Apron I was rehabilitated in 2019 through a pavement overlay and is observed to be in good condition, with limited cracking having developed since the overlay was completed. Rehabilitation is next anticipated to be required in the long-term planning horizon. During the next rehabilitation of Apron I, consideration may be given to installing a subsurface drainage system for glycol collection at the two air carrier parking positions.

Recommendation	Planning Horizon	Cost Estimate
Apron Management Plan Implementation	Short-Term	$20,000
Apron I Expansion	Short-Term	$390,000
Apron I Rehabilitation	Long-Term	$1,810,000

4.1.5. Airfield Lighting and Visual Aids

The airfield lighting system and accompanying visual aids consist of:

- Three illuminated Wind Direction Indicators;
- Medium-intensity runway edge, threshold, and end lighting (Runway 08-26); taxiway edge and runway intersection lights (Taxiway A); and apron edge lights (Apron I);
- Precision Approach Path Indicators (P1) for Runways 08 and 26;
- Aerodrome beacon collocated with the terminal building;
- Four illuminated mandatory instruction and information signs; and
- Aircraft Radio Control of Aerodrome Lighting System collocated with the field electric centre in the terminal building.

The airfield lighting system and visual aids were rehabilitated in 2014 and are reported to be in good condition based on the City's annual megger testing and unit inspection processes. Based on an estimated 20-year useful service life, the airfield lighting system is anticipated to require rehabilitation at the end of the medium-term planning horizon.

Two floodlights are located north of Apron I to provide illumination for the parking and servicing of aircraft. Air carrier schedule changes in 2023 resulted in a greater frequency of aircraft servicing and loading during hours of darkness. The existing floodlights were found to provide inadequate illumination and excess shadowing given their location and luminance; as an interim measure, a mobile floodlight unit was towed to Apron I for air carrier turnarounds during hours of darkness. The replacement of the existing floodlighting is recommended in the short-term planning horizon to improve the safety of aircraft operations and workers on Apron I. Based on engineering commissioned by the City, this project's scope will include the installation of three floodlighting units along the northern and southern edges of Apron I.

Taxiways B and C are certified as private taxiways and are used by aircraft at night. Edge lighting is not installed for either taxiway, nor is such lighting required per TP312 5th Edition; however, retroreflective edge markers are required. Installing retroreflective taxiway edge markers is recommended in the short-term planning horizon.

Concurrent with the 2014 airfield lighting project, the supporting control system for future Omni-Directional Approach Lights was installed. No approach lighting systems are provided at the Airport, which was not identified as a significant operational limitation during the preparation of the Master Plan.

Recommendation	Planning Horizon	Cost Estimate
Taxiway B and C Retroreflective Edge Markers	Short-Term	$10,000
Apron Floodlighting Replacement	Short-Term	$90,000
Airfield Lighting System Rehabilitation	Medium-Term	$2,550,000

4.2. Aircraft Support Services

4.2.1. Aerodrome Advisory, Vehicle Control, and Communication Services

NAV CANADA is the non-profit entity responsible for Canada's civil air navigation system. NAV CANADA operates a Flight Service Station based in the terminal building. The Flight Service Station is staffed for 15 hours per day, during which Flight Service Specialists provide Aerodrome Advisory Services to pilots and Vehicle Control Services. A Remote Communications Outlet enables the Edmonton Flight Information Centre to provide flight information services to en-route aircraft. A Peripheral Air-to-Ground Link facilitates communications with the Edmonton Area Control Centre.

The level of service provided at the Airport is subject to assessment by NAV CANADA in accordance with its Level of Service Policy as part of a Transport Canada regulated framework. NAV CANADA initiated a level of service assessment for the Lloydminster Flight Service Station in 2020 in response to the decrease in the company's revenues during the COVID-19 pandemic and its cost containment strategy. In 2021, NAV CANADA committed that there would be no site closures, including the Lloydminster Flight Service Station, and postponed its level of service assessment. NAV CANADA announced that its level of service assessment has been discontinued as of September 2024.

Future changes in NAV CANADA's advisory and control services in Lloydminster may be made if the company initiates further aeronautical reviews, considering factors such as traffic volume, mix and distribution throughout the day; weather; airport and airspace configuration; surface activity; and the efficiency requirements of operators using the service.

4.2.2. Weather Observations and Forecasting

NAV CANADA is responsible for weather observation and forecasting services at the Airport. Aerodrome Routine Meteorological Reports are issued every hour or as conditions change during the Flight Service Station's staffed hours. Aerodrome Forecasts are issued four times per day, providing a 24-hour localized forecast. NAV CANADA maintains an Automated Weather Observation System and meteorological observation site located east of Apron I. Digital weather cameras are also provided. Between NAV CANADA's staffed and automated reports, weather reporting services are provided 24 hours per day.

Deficiencies have not been identified with NAV CANADA's weather observation and forecasting services at the Airport. As noted previously, changes to weather observation and forecasting services may be made in accordance with NAV CANADA's Level of Service Policy following an aeronautical study.

4.2.3. Electronic Navigation Aids and Instrument Flight Procedures

NAV CANADA has published three instrument approach procedures for the Airport: RNAV (GNSS) Runway 08, RNAV (GNSS) Runway 26, and NDB Runway 26.

The RNAV (GNSS) Instrument Approach Procedures for Runway 08 and 26 permit operations to non-precision minimums, with Minimum Descent Altitudes of 250 ft. Above Ground Level and Minimum Visibilities of 1 Statute Mile. A simplified meteorological analysis using hourly observations from 2014 to 2023 was completed to assess the Airport's current availability afforded through its non-precision procedures versus the availability that would be provided through a Category I precision approach (Table 8). The Airport was available in 97.8% of hourly observations, with monthly availability at the lowest between November and March. With precision Instrument Approach Procedures, annual availability would increase by an estimated 1.2% and monthly availability would increase to 97.5% or greater in all months. The actual improvement in availability may be lower as the analysis underrepresents availability with the current procedures and assumes that precision approaches are available to both Runways 08 and 26; typically, comparable airports have a single runway with a precision approach.

Establishing a precision Instrument Approach Procedure is at the discretion of NAV CANADA through its Level of Service Policy. Significant efforts would be required by the City to update the Airport's certification, physical infrastructure, and lighting. The Master Plan Update assumes that the Airport's non-precision status continues throughout its horizons but may be reassessed pending NAV CANADA inputs.

Table 8 - Instrument Meteorological Conditions Availability Analysis (2014-2023)

Month	Proportion of Hours Below Current Minimums (See Note)	Proportion of Hours Below Category I Precision Minimums	Improvement in Availability
January	5.5%	2.5%	3.0%
February	1.2%	0.4%	0.8%
March	2.6%	1.4%	1.2%
April	1.2%	0.5%	0.7%
May	0.5%	0.3%	0.2%
June	0.5%	0.2%	0.3%
July	0.9%	0.5%	0.4%
August	1.0%	0.6%	0.4%
September	0.8%	0.4%	0.4%
October	1.3%	0.6%	0.7%
November	6.0%	2.4%	3.6%
December	4.5%	2.1%	2.4%
Annual	**2.2%** (See Note)	**1.0%**	**1.2%**

Note: The current availability assessment uses a Minimum Descent Altitude of 300 ft. Above Ground Level vs. the 250 ft. published. Actual availability levels are higher than shown.

4.2.4. Aircraft Fuelling and Ground Handling

Aviation Fuel Facility

The City maintains an aviation fuel facility at the northeast corner of Apron I and sells both 100 Low Lead ("avgas") and Jet A-1 ("jet fuel"). The avgas tank has a capacity of 21,000 L and was installed in 1995, and the jet fuel tank has a capacity of 26,000 L and was installed in 2005. The cardlock point-of-sale system was replaced in 2022. The aviation fuel facility is inspected regularly, and no deficiencies have been reported by the City. Over-wing avgas and jet fuelling is provided, and single point jet fuelling is available. The storage capacity of both tanks has not been identified as a limitation by the City based on typical consumption rates. The replacement of the aviation fuelling facility's storage tanks will depend on their observed condition over time, and this requirement has been assumed in the long-term planning horizon.

Through the recommended implementation of the Apron Management Plan, one of the two air carrier parking positions will be within the 150 ft. fuelling radius without repositioning, assuming single point or over-wing fuelling on the aircraft's right side. All other aircraft must taxi to the area south of the fuelling facility and reposition for departure or parking. This historically has not posed a major operational limitation; however, continued monitoring will be required to assess whether a jet fuel truck for mobile into-aircraft deliveries is warranted within the Master Plan Update's horizons.

Ground Handling Services

Ground handling services during the most recent period of scheduled passenger air services were provided by Border City Aviation. Services provided by Border City Aviation include aircraft marshalling, baggage handling, grooming and detailing, towing, preconditioned air, ground power, and de-icing.

The City intends to improve its in-house ground handling capabilities to complement its aviation fuelling services and as part of its strategy for pursuing scheduled passenger air services and maximizing service levels for charter, corporate, and private operators. Individual airlines may have different service delivery models for their operations, including the provision of owned equipment to their contracted ground handling service provider. Implementing the capabilities described below will also permit the City to provide improved ground handling services to a full range of corporate, charter, and private aircraft operators in addition to potentially serving scheduled air carriers:

- Type I and IV De-icing Unit;
- Passenger Boarding Ramp;
- Pushback Tractor and Towbars;
- Potable Water Cart;
- Lavatory Service Cart;
- Preconditioned Air Unit;
- Ground Power Unit;
- Air Start Unit;
- Baggage Belt Loader;
- Baggage Valet Cart;
- Baggage Carts; and
- Passenger Wheelchairs.

As the City integrates these capabilities into its service offerings, fees for service will need to be established and staff trained on the specific use of each unit. The City's staffing levels will also be required to increase if widespread ground handling services are provided on a routine basis, such as with the support of scheduled passenger air services.

Recommendation	Planning Horizon	Cost Estimate
Aviation Fuel Facility Replacement	Long-Term	$1,000,000
Jet Fuel Truck Acquisition	Trigger-Based	$250,000
Ground Handling Equipment Acquisition	Trigger-Based	$700,000

4.3. Airport Maintenance and Operations

4.3.1. Maintenance Equipment and Storage Facilities

Airport maintenance is completed by the City using the primary maintenance equipment fleet shown in Table 9. Based on Transport Canada's guidance and the City's typical utilization levels for maintenance, each asset has a typical useful service life of between 12 and 20 years.

The equipment fleet and airfield maintenance materials (e.g., sand, de-icing chemicals) are stored in a three-bay garage and a four-bay garage located to the west of the Western Development Area. The four-bay garage was constructed in 2015 to meet the needs of the City's equipment fleet, and the need for the further expansion of storage capacity is not anticipated within the Master Plan Update horizons.

Table 9 - Airport Maintenance Equipment Renewal Plan

Unit Type	Acquisition Year	Replacement Year(s)	Replacement Cost (2024)
Ride-on Mowers (2)	Replaced on ongoing basis as part of the City's fleet motor pool		
Towed Sweeper	2013	2025, 2037	$450,000
One-Ton Truck	2000	2026, 2041	$90,000
Loader	2013	2028, 2043	$430,000
Loader Mounted Snow Blower	2013	2028, 2043	$280,000
Dry Material Spreader	2009	2029	$80,000
Tractor	2014	2029, 2044	$150,000
Rotary Cutter Deck	2010	2030	$50,000
Utility Task Vehicle	2013	2033	$40,000
Pickup Truck	2019	2034	$70,000
Grader	2023	2037	$400,000
Plow Truck, 4x4	2023	2037	$500,000
Maintenance Garage Split Wall Vehicle Fuel Tank	2008	2038	$30,000
De-icing Trailer	2021	2041	$110,000
Sport Utility Vehicle	2013	Replacement to be determined as part of the City's fleet motor pool	

Recommendation	Planning Horizon	Cost Estimate
Maintenance Equipment Fleet Unit Replacements	Short / Medium / Long-Term	See Table 9

4.3.2. Perimeter Fencing and Access Gates

Access to the airfield is restricted by a network of perimeter fencing installed in 2016. While periodic localized repairs may be required, the replacement of the Airport's perimeter fencing is not anticipated to be required within the horizons of the Master Plan Update.

Manual vehicle and person gates provide access to the airfield. To improve the efficiency of access for City Staff and ground ambulances entering Apron I to transfer patients to waiting aircraft, it is recommended that powered access gates be installed in the short-term planning horizon at two locations:

- The Taxiway C gate that is used for equipment access to and from the maintenance garage; and
- The Apron I access road to the west of the terminal building, which is used by ambulances.

Recommendation	Planning Horizon	Cost Estimate
Apron I and Taxiway C Powered Access Gates	Short-Term	$40,000

4.3.3. Electrical Infrastructure

The field electric centre is collocated with the terminal building. The field electric centre includes the infrastructure required to transform electrical power to the correct voltage and distribute it for the various applications of visual aids and lighting systems. The field electric centre was installed in 2012 and is reportedly in good condition. A spare regulator was also installed at this time, providing additional capacity for future growth. Based on an estimated 25-year useful service life, the field electric centre components (e.g., regulators, control systems) may require replacement in the long-term planning horizon.

The Airport's backup generator, located immediately to the east of the terminal building, is fully automated and provides sufficient capacity to support uninterrupted operations in the event of a mainline power failure. The backup generator was installed in 2020, and replacement is not anticipated to be required within the Master Plan Update horizons.

Recommendation	Planning Horizon	Cost Estimate
Field Electric Centre Equipment Replacement	Long-Term	$80,000

4.4. Groundside System

4.4.1. Terminal Building Road, Curbside, and Parking Lot

Terminal Building Road and Curbside

The terminal building is served by an unlit unidirectional ring road, with traffic entering the Airport from the west and exiting to the east onto Township Road 502A. The terminal building road has a two-lane cross-section with a width of approximately 7 m prior to the parking lot access. After this point, it transitions to a 4 m one-lane cross-section where it joins with the terminal building curbside. The road transitions back to a two-lane cross-section after the parking lot exit. The width of the terminal building road and its lane transitions near the parking lot have reportedly caused safety issues with vehicles exiting the roadway. The reconfiguration of the terminal building road is recommended in the short-term planning horizon concurrent with the rehabilitation of the parking lot, including the installation of overhead lights.

The curbside is the interface between the terminal building and the groundside system. The curbside extends for 80 m immediately to the north of the terminal building and is divided into three lanes:

- **North:** Vehicle loading and unloading;
- **Centre:** Through traffic; and
- **South:** Fire lane.

The need to extend the curbside is not foreseen within the Master Plan horizons, and reconfiguration will be considered as part of the broader terminal building road and parking lot project.

Terminal Building Parking Lot

A 7,000 m^2 paved parking lot is located north of the terminal building. Access is provided from the terminal building road, entering from the west and exiting to the east. A total of 154 parking spaces are provided for meeters and greeters, passengers, and employees. Parking is provided free of charge for up to 30 days. Parking spaces are not demarcated according to the intended user.

Parking data was reviewed for 2018 and 2019 during the Airport's highest level of use for scheduled passenger air services, with daily car counts completed in the mid-afternoon. From the dataset:

- Average daily occupancy increased from 14% (21 vehicles) in January 2018 to 50% (77 vehicles) in November 2019;
- The commencement of WestJet Link service in June 2018 had a significant impact on parking activity, with average occupancy increasing from 17% in May 2018 to 43% in July 2018;
- Maximum occupancy has reached 66% (102 vehicles in September 2019), with a residual availability of 52 spaces; and
- Parking lot activity is strongly correlated with passenger levels.

Consultations with Airport Staff, car rental agencies and Airport users during the preparation of the Master Plan did not reveal any deficiencies with the existing parking lot. Except for WestJet Link's inaugural flight in June 2018, parking lot capacity has not been reached. Parking demand forecasting completed as part of the Master Plan based on anticipated passenger activity found that the parking lot was expected to have adequate capacity to the end of 2030, but that capacity may be exceeded based on continued passenger growth. However, the forecast also found that capacity could be reached or exceeded during occasional peak days prior to 2030. To meet forecast demand, the Master Plan recommended expanding and reconfiguring the parking lot to a capacity of 220 spaces in its medium-term planning horizon.

Parking lot demand at the Airport is driven primarily by scheduled passenger air services, creating uncertainty on future demand based on:

- The type of travellers attracted by the restored service offering and their vehicle access needs (e.g., visitors relying more heavily on rental cars and taxis, residents parking cars for extended trips, etc.);
- The overall volume of passengers served and associated demand; and
- The historical parking capacity used by rental car providers that are no longer located at the Airport.

Despite the foregoing, the parking lot requires rehabilitation and would benefit from its reconfiguration and improvement during a time with limited use and associated construction disruption. Accordingly, it is recommended that the parking lot be reconfigured and expanded to a total capacity of approximately 230 spaces in the short-term planning horizon, pending further design.

Recommendation	Planning Horizon	Cost Estimate
Terminal Building Road and Parking Lot Rehabilitation and Reconfiguration	Short-Term	$2,120,000

4.4.2. Development Area Service Roads

Service roads provide access to the Western and Eastern Development Areas and include 85 Avenue, 70 Street, 84 Avenue, 81 Avenue, and 80 Avenue. The service roads are gravel, bidirectional, and have cross sections of 7 m to 8 m. The development area service roads were observed to be in fair condition and will require ongoing maintenance and periodic repairs. The comprehensive rehabilitation of the development area service roads is not anticipated to be required within the Master Plan Update horizons. Based on current and anticipated use levels and vehicle loads, paving is not expected to be required.

Development lots abutting Township Road 502A in the Western and Eastern Development Areas currently lack service roads, and three hangars in the Western Development Area have been built with access directly to the roadway. Limiting the number of accesses onto Township Road 502A will decrease vehicle conflicts and turning movements, thereby improving safety in a manner that is consistent with Alberta Transportation guidance. The construction of gravel service roads parallel to Township Road 502A will be initiated in the future depending on the level of lot absorption experienced at the Airport.

Recommendation	Planning Horizon	Cost Estimate
Western Development Area Service Road	Trigger-Based	$510,000
Eastern Development Area Service Road	Trigger-Based	$550,000

4.5. Utilities and Servicing

4.5.1. Potable Water and Sanitary Sewer Services

The Airport is not connected to the municipal potable water system. The terminal building is provided with potable water through a 6,000-gallon cistern located immediately to the east. Tenants are responsible for the delivery and storage of potable water to their respective leasehold lots.

Sewage from the terminal building is directed to two septic tanks west of the building, before it is routed to a sanitary drain field south of Apron I and west of Taxiway A. Tenants are responsible for the storage and pumping of septic waste for their respective leasehold lots.

The lack of potable water and sanitary sewer services has been identified by the City as a competitive disadvantage to attracting further airside and groundside development and is an operational limitation. Preliminary engineering assessments have been completed by the City, confirming the feasibility of extending services to the Airport. It is recommended that this project be advanced in the short-term horizon.

Recommendation	Planning Horizon	Cost Estimate
Extension of Potable Water and Sanitary Sewer Services	Short-Term	$3,000,000

4.5.2. Shallow Utilities

Natural gas is distributed to the Airport by ATCO Gas. Gas lines are installed throughout the Airport to the airside development lots, with servicing extended to the lot line. It is the responsibility of the tenant to arrange a connection to the natural gas system.

The electricity lines to the Airport are owned by ATCO and services are retailed through several vendors. Power is extended to the leasehold lots, with tenants being responsibility for arranging connections.

Telus Communications and Xplornet provide internet services to Lloydminster Airport. Fibreoptic internet has been installed by Telus to the terminal building, which serves as the fibreoptic hub for the surrounding area. Lines can be extended to service new development through conduits.

Telus Communications provide telephone services.

4.6. Airport Development and Land Use Plan

4.6.1. Airport Development and Apron Management Plans

The Airport Development Plan (Figure 8) depicts infrastructure expansion and reconfiguration projects recommended or reserved through the Master Plan Update, as well as the preferred locations for future airside land development. Features of the Airport Development Plan include:

- The reserving of land to permit the maximum build-out of Runway 08-26 to a length of 2,591 m;
- The relocation, realignment, and extension of Runway 13-31 pending the potential development of a parallel taxiway along its southern extents, if implemented;
- The development of a partial-length parallel taxiway to the Runway 26 threshold and concurrent reconfiguration of Taxiways B and C;
- The expansion of Apron I and the reservation of lands for its further growth;
- The extension of Taxiway B to service additional airside lots in the Eastern Development Area;
- The reconfiguration and expansion of the terminal building road and parking lot; and
- The development of service roads for the lots along the northern boundaries of the Western and Eastern Development Areas.

The Airport Development Plan has been prepared in accordance with the regulatory standards provided in TP312 – Aerodrome Standards and Recommended Practices (5th Edition); updates may be required pending future regulatory changes. The Airport Development Plan also accounts for applicable aeronautical and non-aeronautical constraints.

The Apron Management Plan depicts the two-part approach recommended to address the capacity limitations of Apron I, the implementation of which is recommended in the short-term planning horizon. Key features of the Apron Management Plan include:

- Two designated parking positions that permit independent power-in, power-out operations by two aircraft up to the Dash 8-400 to the south of the terminal building, with these stands intended for scheduled and charter passenger air carriers;
- Demarcated parking areas on the south end of Apron I for itinerant aircraft. Sufficient space is shown for parking up to four representative corporate and charter turbofan aircraft simultaneously, with this capacity increased through the recommended expansion of the apron;
- The delineation of apron taxilanes for aircraft transiting to Taxiways B and C;
- Continued fuelling services from the current facility, and the easternmost air carrier position can refuel without relocating;
- Through the expansion of Apron I to the east, the development of a taxilane bypass around the fuelling facility; and
- The addition of a paved area for ground support equipment parking north of Apron I, the improvement of the paved accessway to the western edge of the terminal building, and the relocation of one ground power position to the west.

These measures are expected to improve Apron I's functionality for its primary users while limiting more cost-intensive expansion requirements. Following the recommended implementation of the partial-length parallel taxiway and concurrent reconfiguration of Taxiways B and C, consideration may be given to terminating the existing access points of these taxiways with Apron I to achieve further parking capacity.

4.6.2. Land Use Plan

The Land Use Plan is consistent with the Airport Development Plan and protects for all anticipated developments within each of the planning horizons of the Master Plan Update, and beyond. The Land Use Plan has five purposes:

1. Protect for safe and efficient Airport operations;
2. Provide sufficient land for recommended Airport projects;
3. Maximize opportunities for land development;
4. Minimize adverse impacts to off-Airport land uses; and
5. Ensure that all development occurs in a logical and orderly manner.

Future development is expected to occur in a manner that is consistent with the Land Use Plan. Six land use designations are applied to the Airport property, as described below and shown in Figure 10:

- **Airfield (153 ha):** The lands reserved for the current and proposed runways, taxiways, and aprons, as well as their associated regulatory setbacks and constraints. This designation also includes the meteorological observation site and electronic navigation aids;
- **Airport Operations (5 ha):** Facilities that support the operation and maintenance of the Airport, including the terminal building and maintenance facility;
- **Aviation Development (8 ha):** Lots with airside access that are reserved for tenants that require access to the Airfield or that support the core aviation functions of the Airport. Acceptable land uses include aircraft hangars, Fixed-Base Operators, Aircraft Maintenance Organizations, Flight Training Units, air cargo facilities, and aircraft support services. Non-aviation uses are discouraged;
- **Flexible Development (32 ha):** Parts of the Airport that may accommodate aviation or compatible non-aviation development, depending on the highest and best use of the lands;
- **Groundside System (12 ha):** Areas of the Airport used for groundside access and circulation, including the terminal building road and curbside, parking lot, and service roads; and
- **Airport Reserve (85 ha):** Lands for which a specific use has not been identified through the Master Plan Update that are reserved to meet unforeseen requirements.

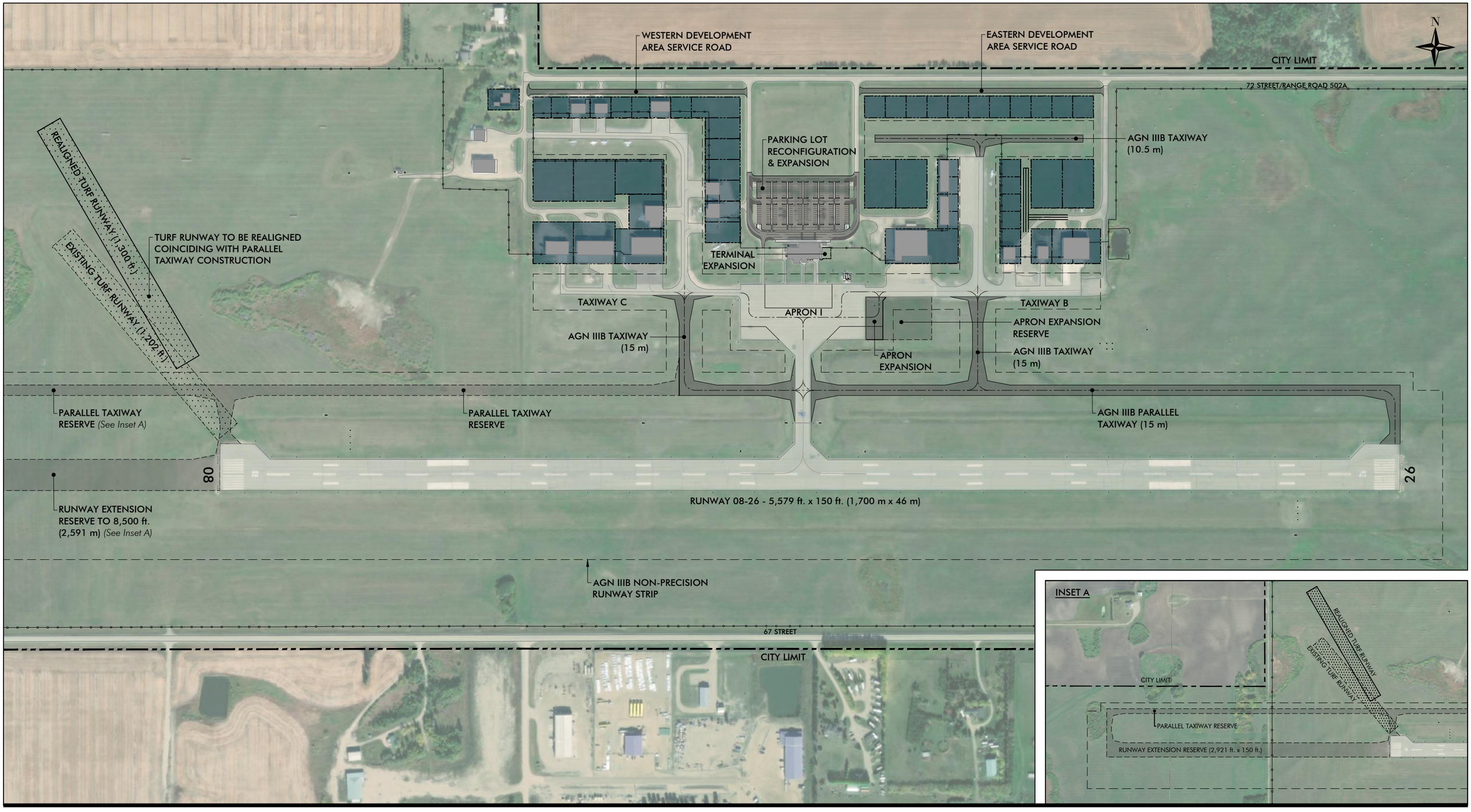

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FIGURE 8
AIRPORT DEVELOPMENT PLAN

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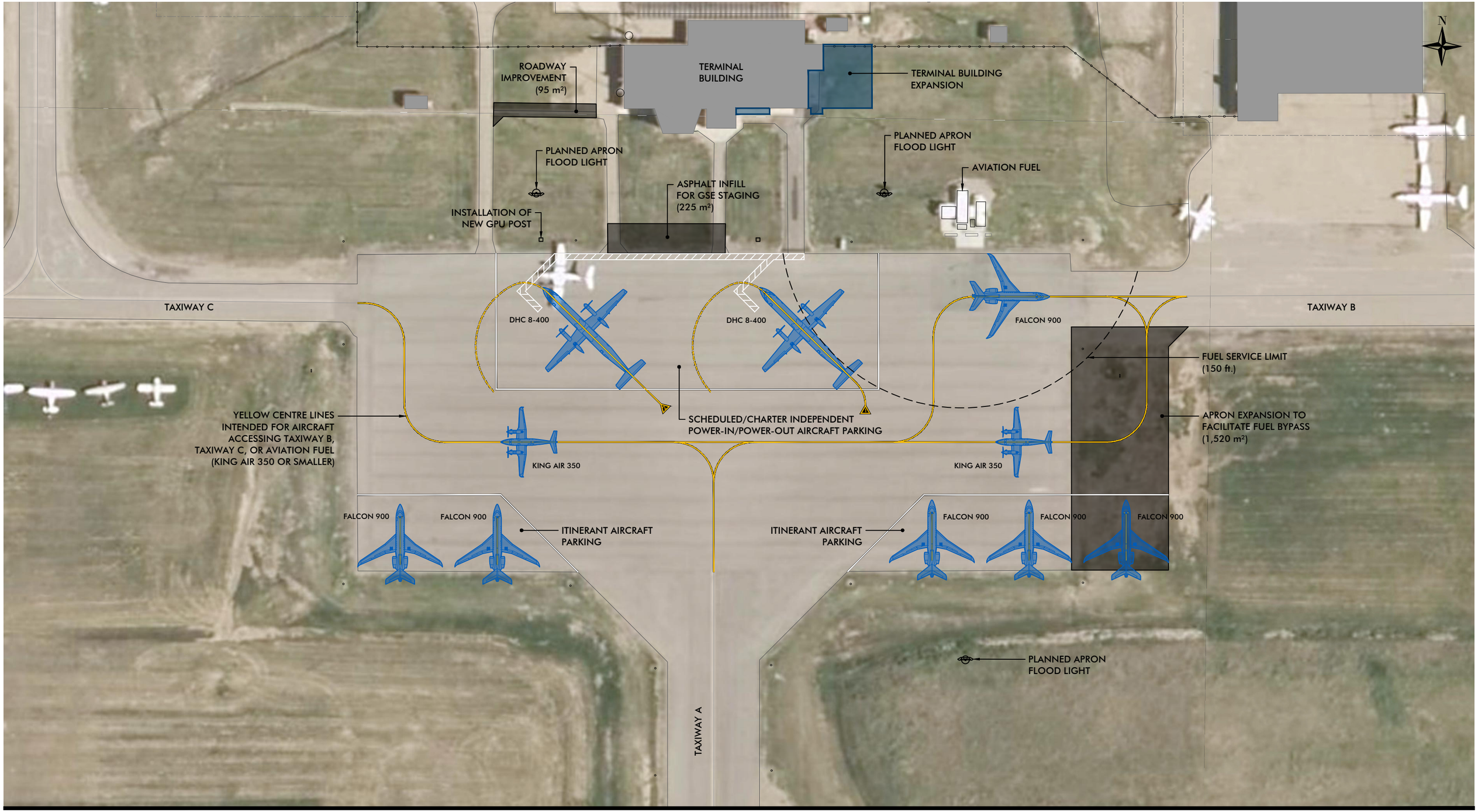

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FIGURE 9
APRON MANAGEMENT PLAN

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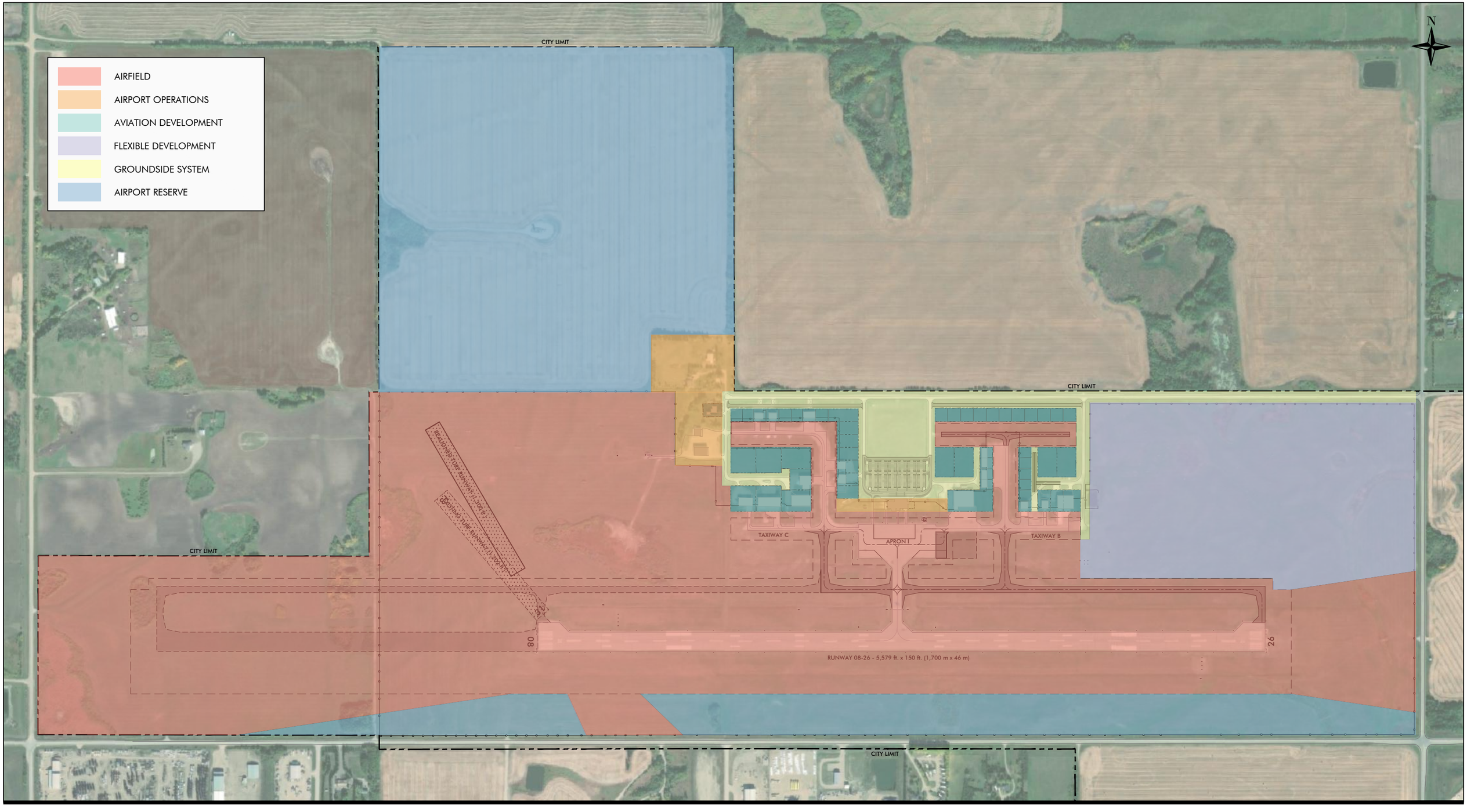

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FIGURE 10
LAND USE PLAN

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5. TERMINAL BUILDING REQUIREMENTS AND DEVELOPMENT PLAN

5.1. Terminal Building Overview

The terminal building was constructed in 1981 and supports operations by scheduled and charter air carriers, itinerant aircraft, NAV CANADA's Flight Service Station, and administrative functions for Airport Staff and third parties. The terminal building has supported scheduled and charter passenger air services in the 18 to 50-seat range by Central Mountain Air, Sunwest Aviation, and WestJet Link, as well as occasional operations by larger aircraft such as the 78-seat Dash 8-400 during equipment substitutions.

The terminal building's ground floor plan is shown in Figure 11. The terminal building is divided into three functional areas:

- **Public:** The public area includes the passenger check-in area, general waiting area with 51 seats, secure passenger holdroom with 50 seats, arrivals area with a small non-recirculating baggage reclaim unit, washrooms, and miscellaneous amenities in the general waiting area;
- **Administration and Operations:** Office space is allocated for CATSA, air carriers (two offices), and the Airport Manager; the City's Emergency Operations Centre / staff meeting and rest area; outbound and inbound baggage handling; CATSA pre-board passenger and baggage screening; and electrical and mechanical rooms; and
- **NAV CANADA:** NAV CANADA leases space on the main floor for administrative, storage, and workshop space to support its Flight Service Station. The Flight Service Station observation cab is located on the second storey and is the only part of the terminal building not on the main level.

The floor space allocated to each functional area is provided in Table 10.

Table 10 - Terminal Building Current Functional Areas

Functional Area	Area (m^2)	Notes
Public		
Check-In	21	Two check-in counters and four check-in positions; estimated throughput of 60 passengers per counter per hour
Check-In Queuing	26	
Concessions	14	Vending machines and coffee station
General Waiting Area / Unsecure Passenger Holdroom	44	Seating for 51 individuals
Secure Passenger Holdroom	62	Seating for 50 individuals
Washrooms	36	Gendered washrooms pre-security
Arrivals Area	30	
Administration and Operations		
CATSA Pre-Board Screening	39	Passenger and hold baggage screening Estimated throughput of 48 passengers per hour
CATSA Pre-Board Screening Queuing	22	
Outbound Baggage Handling	34	Addition constructed in 2001
Inbound Baggage Handling	11	Unidirectional baggage claim device with 5.4 m of access frontage
Car Rental Counters	13	Two counters
Janitorial, Mechanical, and Electrical Rooms	48	
Emergency Operations Centre / Airport Staff Area	45	
Office – Airport Manager Office	18	One office
Office – CATSA	14	One office
Offices – Air Carrier	24	Two offices
Baggage Equipment Storage	41	Addition constructed in 2001
Secure Storage	15	
Other	230	
NAV CANADA		
NAV CANADA	166	Administrative, storage, and workshop space and second-storey observation cab

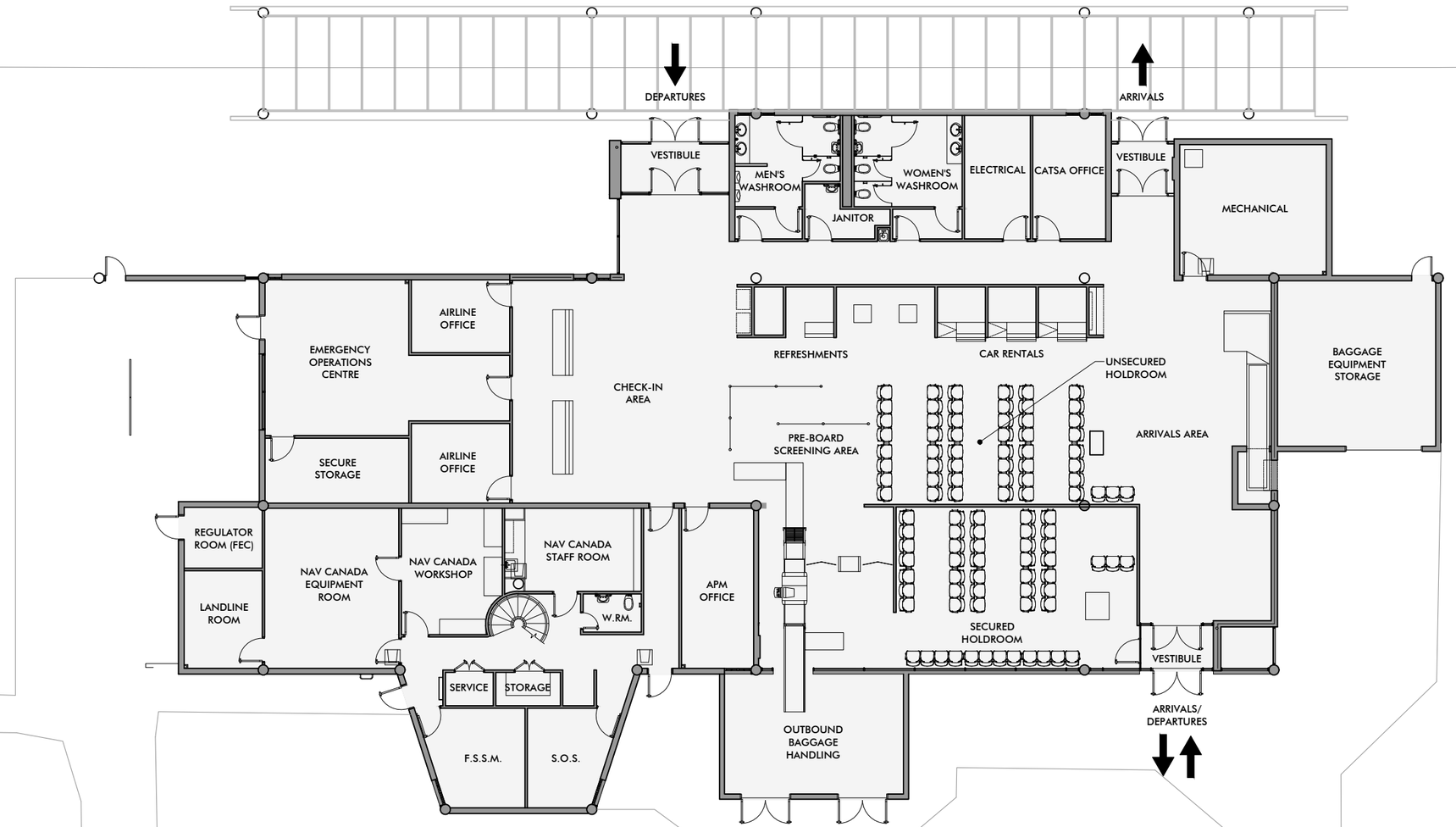

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FIGURE 11
CURRENT TERMINAL BUILDING GROUND FLOOR PLAN

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5.2. Functional Systems and Lifecycle Requirements

A comprehensive condition assessment of the terminal building was completed in 2015, which found that the interior condition was in functionally good condition with some areas requiring remedial work to repair incidental damage from daily operations and wear. Of note in 2015 was the apparent settling of the concrete slab on grade in the southwest corner of the building. The exterior above-grade building envelope components appeared to be performing as anticipated, although moisture-related deterioration was evident at several locations. In 2023, new boilers were installed. Improvements to the terminal building's functional systems and other lifecycle renewal projects are required independent of the building development scenarios described in the following subsections. Based on inputs provided by the City, the following projects are known at the time of the Master Plan Update's preparation:

- Short-Term Planning Horizon:
    - Replacement of interior lighting;
    - Construction of secure holdroom gender neutral barrier-free washroom;
    - Redevelopment of pre-security gender-separated washrooms with universal washrooms;
    - Replacement of air handling unit; and
    - Removal of demountable partitions formerly used for car rentals and concessions.
- Medium-Term Planning Horizon:
    - Replacement of northern departure and arrival sliding doors;
    - Building envelope repairs;
    - Replacement of roof; and
    - Replacement of windows.

Recommendation	Planning Horizon	Cost Estimate
Terminal Building Lighting, Washroom, Air Handling, and Interior Improvements	Short-Term	$500,000
Terminal Building Door, Building Envelope, Roof, and Window Repairs and Replacements	Medium-Term	$750,000

5.3. Scenario 1 – Hub Connectivity, Network

In Scenario 1, secured service by a network air carrier to a hub airport is launched at the Airport using an aircraft in the 70 to 80-seat range, such as the 78-seat Dash 8-400. The terminal building continues to support unsecure arrivals and departures by itinerant operators, including charter, corporate, and private aircraft. The following functional areas are undersized relative to peak hour demand in Scenario 1:

- General waiting area and terminal circulation space;
- Queuing for CATSA Pre-Board Screening;
- Secure holdroom; and
- Baggage claim device frontage length and arrivals area size.

To most efficiently accommodate the expanded functional areas required in Scenario 1, a 340 m^2 single-storey lateral expansion of the terminal building is conceptually shown to the east. The CATSA Pre-Board Screening area and secured holdroom are relocated to the eastern side of the terminal building to provide sufficient space, and the current secure holdroom is converted to the arrivals area with a higher capacity baggage claim device to meet demand. The concept described in Scenario 1 is shown in Figure 12.

5.4. Scenario 2 – Hub Connectivity, Regional

In Scenario 2, secured service by a regional air carrier to a hub airport is restored at the Airport. This scenario is most comparable to the previous period of operations by WestJet Link, with the assumption of service using an aircraft in the 18 to 50-seat range. The terminal building continues to support charter, corporate, and private arrivals and departures in addition.

The primary deficiencies with the current capabilities of the terminal building include the undersized secure holdroom and CATSA Pre-Board Screening area. To address these deficiencies, the secured holdroom is expanded into part of the general waiting area / unsecure holdroom through the relocation of the internal partition walls to reconfigure the space, with seating for approximately 50 passengers provided. The terminal building floor plan in Scenario 2 is shown in Figure 13.

Scenario 2 may function as an interim operational concept for an air carrier described in Scenario 1 to commence service prior to the terminal building's expansion, while operating at a non-optimum level of service until the Scenario 1 expansion is complete.

5.5. Scenarios 3 and 4 – Regional Point-to-Point Service and No Restoration of Service

The final terminal building concept addresses the Airport's operational requirements in two scenarios:

- In Scenario 3, unsecure scheduled passenger air services are provided by a regional air carrier using an aircraft in the 18 to 50-seat range; and
- In Scenario 4, the Airport's scheduled passenger outlook presents no opportunities for the restoration of service for the foreseeable future.

In both Scenarios 3 and 4, the terminal building continues to be used for charter, corporate, and private arrivals and departures. The assumption is made that CATSA withdraws its Pre-Board Screening services and equipment from the Airport, allowing for the repurposing of the terminal building to better support unsecure arrivals and departures. The current secured holdroom remains at its current size with seating for 50 passengers, while the general waiting area is repurposed and improved through tables and chairs, armchairs, and / or other more premium seating for passenger comfort. No other major changes to the terminal building are considered in this concept.

The Scenario 3 / 4 terminal building concept is shown in Figure 14.

5.6. Terminal Building Development Plan Summary

The three terminal building development options provide flexibility to the City in matching the facility's capabilities with the needs of its future end users. The implementation of the terminal concepts described in Scenarios 2 and 3/4 do not preclude future expansion and reconfiguration to accommodate Scenario 1. The three options are summarized in Table 11. Planning horizons are not identified for the three options, as it is expected that future decision-making on the preferred option will be informed by air service development efforts underway per the City's Commercial Air Services Feasibility Study.

Table 11 - Terminal Building Development Plan Summary

Scenario	Passenger Capacity (Departing / Arriving)	CATSA Screening	Building Expansion	Internal Reconfig.	Cost Estimate (See Note)
1 – Figure 12	80	Yes	Yes – 340 m^2	Yes	$3,700,000
2 – Figure 13	50	Yes	No	Yes	$400,000
3 / 4 – Figure 14	50	No	No	Yes	$100,000

Note: Cost estimates do not include terminal functional system and lifecycle requirements identified in Section 5.2

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N

DEPARTURES

ARRIVALS

VESTIBULE

UNIVERSAL WASHROOMS

JANITOR

ELECTRICAL

CAR RENTAL OFFICE

VESTIBULE

MECHANICAL

VENDING / WATER FILL STATION

CAR RENTAL COUNTER

AIRLINE OFFICE

EMERGENCY OPERATIONS CENTRE

CHECK-IN AREA

WAITING AREA

SECURE STORAGE

AIRLINE OFFICE

PRE-BOARD SCREENING AREA

SECURE SEARCH

OUTBOUND BAGGAGE HANDLING

SECURED HOLDROOM

CATSA OFFICE

REGULATOR ROOM (FEC)

NAV CANADA EQUIPMENT ROOM

NAV CANADA WORKSHOP

NAV CANADA STAFF ROOM

APM OFFICE

ARRIVALS AREA

WATER FILL STATION

UNIVERSAL WASHROOMS

LANDLINE ROOM

W.RM.

VENDING

VESTIBULE

SERVICE

STORAGE

ARRIVALS

VESTIBULE

DEPARTURES

INBOUND BAGGAGE HANDLING

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FIGURE 12
TERMINAL BUILDING GROUND FLOOR PLAN, SCENARIO 1

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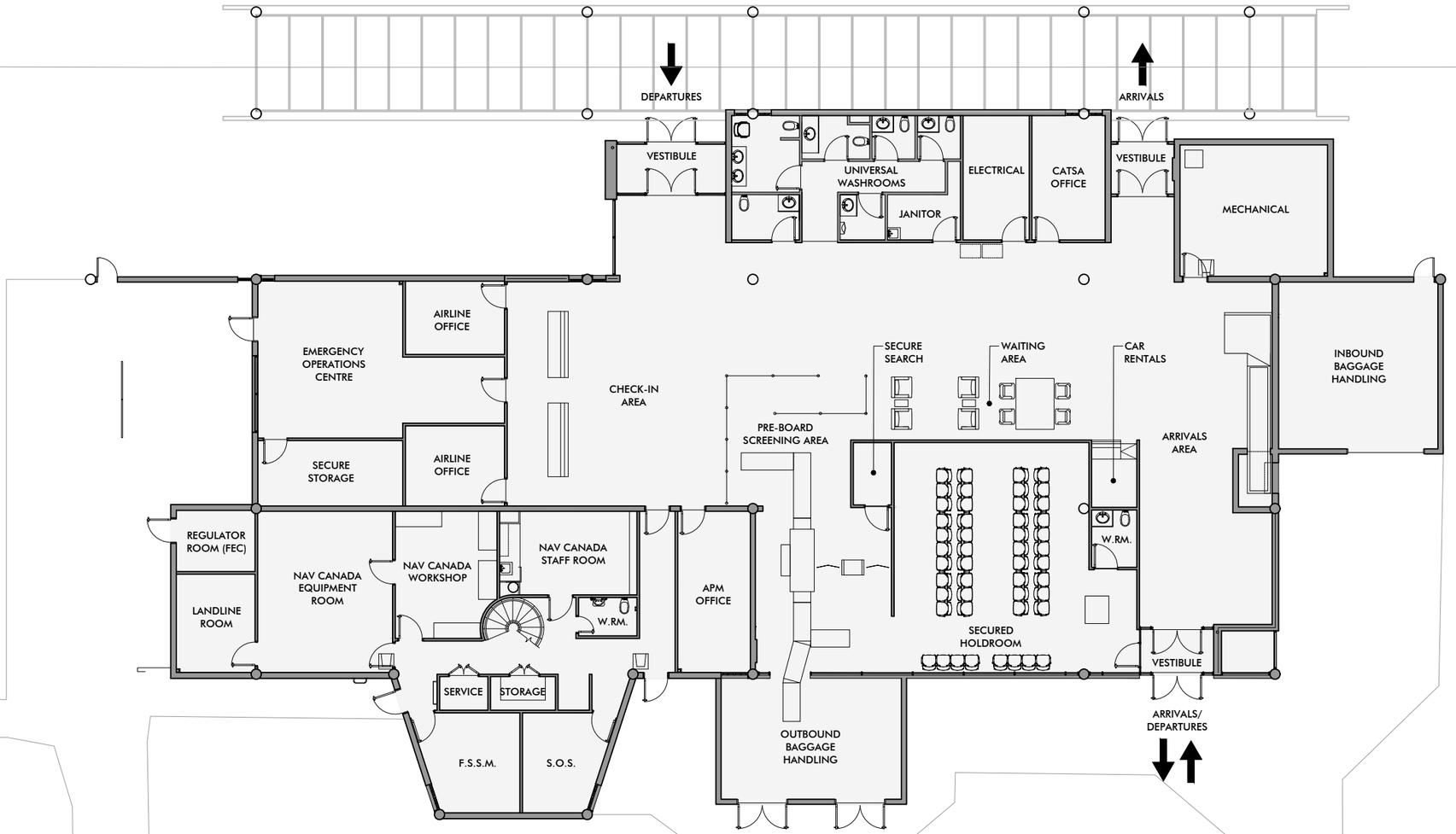

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FIGURE 13
TERMINAL BUILDING GROUND FLOOR PLAN, SCENARIO 2

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FIGURE 14
TERMINAL BUILDING GROUND FLOOR PLAN, SCENARIO 3 / 4

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6. IMPLEMENTATION

6.1. Capital Plan

The recommendations provided in Sections 4 and 5 of the Master Plan Update are consolidated into the Airport's 20-year Capital Plan, which is summarized in Table 12. Trigger-based capital projects that are not tied to a defined implementation year or period are summarized in Table 13. Projects with predefined implementation horizons and target years are identified in Table 14, Table 15, Table 16, and Table 17.

All capital cost estimates are provided at the Class D level of detail, are adjusted for inflation (assumed at 2% annually) based on their implementation year, and exclude costs associated with regulatory permitting, engineering design, and procurement. During project implementation planning cycles and prior to applications for grant funding and the City's annual budgeting process, project costs should be revisited at a more refined level of detail through the solicitation of quotes, engineering design and estimating services, and other methods.

Table 12 - Capital Plan Annual Total Costs

Short-Term					Medium-Term				
2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
$2,690,000	$663,000	$3,527,000	$753,000	$249,000	$55,000	$845,000	$0	$47,000	$3,131,000
Long-Term									
2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
$1,219,000	$99,000	$1,712,000	$39,000	$11.769M	$0	$275,000	$2,632,000	$1,014,000	$219,000

Notes: Please refer to Tables 14-17 for detailed project costs by year. Trigger-based capital projects are not included and are shown in Table 13.

Table 13 - Capital Plan, Trigger-Based Projects

Project	Cost Estimate	Project	Cost Estimate
Runway 13-31 Relocation and Extension	$450,000	Western Development Area Service Road	$510,000
Taxiway B Northern Extension	$930,000	Eastern Development Area Service Road	$550,000
Partial Length Parallel Taxiway and Extension of Taxiways B and C	$5,790,000	Terminal Building Scenario 1 Development	$3,700,000
Jet Fuel Truck Acquisition	$250,000	Terminal Building Scenario 2 Development	$400,000
Ground Handling Equipment Acquisition	$700,000	Terminal Building Scenario 3 Development	$100,000

Table 14 – Capital Plan, Short-Term Planning Horizon (2025-2029)

Short-Term (2025-2029)					
Project	**2025**	**2026**	**2027**	**2028**	**2029**
Taxiway B and C Retroreflective Edge Markers	$10,000				
Apron Management Plan Implementation	$20,000				
Apron I and Taxiway C Powered Access Gates	$40,000				
Terminal Building Lighting and Post-Security Washroom	$50,000				
Towed Sweeper Replacement	$450,000				
Terminal Building Road and Parking Lot Rehabilitation and Reconfiguration	$2,120,000				
Airfield Pavement Load Rating Testing		$20,000			
One-Ton Truck Replacement		$92,000			
Apron Floodlighting Replacement		$92,000			
Terminal Building Pre-Security Washroom, Air Handling, and Interior Improvements		$459,000			
Apron I Expansion			$406,000		
Extension of Potable Water and Sanitary Sewer Services			$3,121,000		
Loader Mounted Snow Blower Replacement				$297,000	
Loader Replacement				$456,000	
Dry Material Spreader Replacement					$87,000
Tractor Replacement					$162,000
Total	**$2,690,000**	**$663,000**	**$3,527,000**	**$753,000**	**$249,000**

Table 15 – Capital Plan, Medium-Term Planning Horizon (2030-2034)

Medium-Term (2030-2034)					
Project	**2030**	**2031**	**2032**	**2033**	**2034**
Rotary Cutter Deck Replacement	$55,000				
Terminal Building Door, Building Envelope, Roof, and Window Repairs and Replacements		$845,000			
Utility Task Vehicle Replacement				$47,000	
Pickup Truck Replacement					$84,000
Airfield Lighting System Rehabilitation					$3,047,000
Total	**$55,000**	**$845,000**	**$0**	**$47,000**	**$3,131,000**

Table 16 - Capital Plan, Long-Term Planning Horizon (2035-2039)

Long-Term (2035-2039)					
Project	**2035**	**2036**	**2037**	**2038**	**2039**
Aviation Fuel Facility Replacement	$1,219,000				
Field Electric Centre Equipment Replacement		$99,000			
Grader Replacement			$507,000		
Towed Sweeper Replacement			$571,000		
Plow Truck Replacement			$634,000		
Maintenance Garage Fuel Tank Replacement				$39,000	
Taxiway A Rehabilitation					$831,000
Apron I Rehabilitation					$2,388,000
Runway 08-26 Rehabilitation					$8,550,000
Total	**$1,219,000**	**$99,000**	**$1,712,000**	**$39,000**	**$11,769,000**

Table 17 - Capital Plan, Long-Term Planning Horizon (2040-2044)

Long-Term (2040-2044)					
Project	**2040**	**2041**	**2042**	**2043**	**2044**
One-Ton Truck Replacement		$124,000			
De-Icing Trailer Replacement		$151,000			
Taxiway C Rehabilitation			$1,232,000		
Taxiway B Rehabilitation			$1,400,000		
Loader Mounted Snow Blower Replacement				$400,000	
Loader Replacement				$614,000	
Tractor Replacement					$219,000
Total	**$0**	**$275,000**	**$2,632,000**	**$1,014,000**	**$219,000**

6.2. Master Plan Implementation and Updates

The Master Plan Update provides overarching direction on investments required in the Airport's infrastructure and services to accomplish the City's objectives for the facility and further its social and economic role. Prior to the implementation of each recommendation, a detailed assessment will be required to confirm the continued need for the project, its scope, and refined design requirements and cost estimates. This is anticipated to occur annually through the City's project planning and budgeting processes.

The advancement of the Master Plan Update's objectives will be directed by City Council as the Airport's governance body. Interdepartmental collaboration will be required for several capital and business development initiatives, including:

- **Transportation Services**, as the organizational unit responsible for the daily operation of the Airport;
- **Economic Development**, for matters addressing business attraction and retention, including air service development;
- **Planning & Engineering** for the design and implementation of capital projects;
- **Building Maintenance** for the upkeep and renewal of the Airport's various buildings; and
- **Procurement** for the procurement of goods and services.

Airport staffing levels will be evaluated annually and may require updating based on the evolution of the facility's operations and end user requirements. Higher levels of ground handling services being provided by Airport Staff to support scheduled passenger air services and / or the City's role as a Fixed-Base Operator may result in the need to expand staffing levels through part-time and / or full-time positions. Detailed evaluation will be required as part of the City's operating budget process to determine the financial capacity and requirements for these net new staffing requests, if warranted.

In addition to the annual reviews of the Master Plan Update and the validation of its recommendations, a comprehensive review on a five-year cycle is recommended. These review cycles may identify the need for document updates or replacement updates to ensure continued utility in response to changing conditions.

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