WHITECOURT AIRPORT MASTER PLAN UPDATE
ADDENDUM

December 2020

INTRODUCTION

Upon completion of the 2020 Airport Master Plan Update for Whitecourt Airport, Woodlands County requested WSP interview a number of additional airport stakeholders that were not included in the original engagement process. In addition, the county requested WSP undertake a review of taxation rates at comparable airports.

STAKEHOLDER ENGAGEMENT

Additional airport stakeholders that were contacted include:

- **Sequoia Helicopters** (Ralph Wagner)

  Operate a number of helicopters at Whitecourt Airport in support of the oil and gas industry and forest fire support. Equipment includes Bell 212, Bell Long Ranger, and AS 350.

- **Rotorworks Inc**. (Ryan Clough and Jim Hoffland)

  Operate a helicopter flight school at Whitecourt Airport. They operate R22, R44, and Bell 206 helicopters. Approximately 30 – 40% of the movements at the airport are associated with flight training. Approximately 1/3 of the flight training program is in the airport circuit. Rotorworks typically train 10-12 pilots per year and also provide proficiency flight tests.

- **Northwest Helicopter Service** (Darcy Cornock)

  Operate a helicopter maintenance facility at Whitecourt Airport. Unlike the other stakeholders interviewed, the company owns both the hangar and the land.

- **Dan Guenette**, member of the Airport Advisory Committee.

  Dan is a licenced pilot of both fixed and rotary wing aircraft and a member of the Airport Advisory Committee.

A number of key issues were raised that were common to all of the discussions. They included:

- All of the stakeholders stated there are currently no conflicts between the rotary wing and fixed wing operators at the airport. They agree that the best approach to avoiding potential conflicts is the practice of good airmanship and professionalism. Although the separation of fixed wing and rotary operators on the airport has some benefit, it would be very costly to relocate operators at the airport, and some fixed wing and rotary wing operators share common facilities.

- All of the stakeholders expressed concerns regarding the high lease rates and taxation rates at the airport. It was noted that in the past three years, taxes have nearly doubled, yet services provided by the airport have not substantially improved during the same period.
- Airport security is an issue at the airport. It was noted that it is very easy for the public to gain access to airside. The stakeholders indicated that in recent weeks an RV trailer was stolen from the airport. The stakeholders indicated that additional security fencing is required.
- Seasonal flooding was raised as an issue and that there is a need for better drainage in certain sections of the airport. It was noted that in the spring the water table is very high.
- Although stakeholders commended snow removal activities on airside, they indicated snow removal activities on landside are poor and can be approved.
- It was noted by some that elements of the airport, such as the terminal building are aging and in need of upgrading or replacement.

PROPERTY TAX

Property tax is a significant income source for municipalities and counties, charged to the owner of each property on a regular basis, usually monthly or annually. The tax rate is decided each year by municipal councils, based on the anticipated expenditures for public services provided by the municipality, including education, emergency services and libraries.

Property tax rates differ between different types of property and the structures associated with it. Most municipalities have different property tax rates for residential properties and non-residential properties, but often there are additional or more detailed categories which differentiate between types of residential property, such as low-density or high density, and non-residential properties, such as industrial or commercial. The total property tax rate that is charged to each property can be composed of multiple smaller rates. For instance, a general municipal rate is a component of the total tax rate that is typically applicable to all properties; other tax rates, such as school board, senior facility, and designated industrial property tax rates, may be applicable to a certain subset of properties within the municipality. The total property tax rate charged to a given property is therefore a sum of all the applicable rates to that property.

Since municipalities have different property tax rates, these rates may play a role in municipality competitiveness and ability to attract and retain both residents and commercial activities. Even if a commercial establishment is leasing the lands from a different landowner who pays the property tax to the municipality, property tax rates are often passed down in the lease rate to the leasing party, which may result in higher lease rates than at other municipalities with lower property tax rates.

ALBERTA AIRPORTS FOR PROPERTY TAX RATE COMPARISON

Five (5) Alberta airports were selected from the list of airports provided by Woodlands County for lease rate analysis. The airports examined included: Fort McMurray (CYMM), High Level Airport (CYOJ), Edson Airport (CYET), Peace River Airport (CYPE), and Slave Lake Airport (CYZH).

PROPERTY TAX RATE RESEARCH FINDINGS

Property tax rates were obtained from each municipality's webpage and property tax rate by-law for the 2020 taxation year. The tax rates were represented in mills, which represents the amount of property tax paid annually per $1000 dollars of assessed property value of the property in question. For example, a mill rate of 10.0 mills would generate $1,000 in property taxes annually from a property whose value was assessed to be $100,000. For certain municipalities, mill rates were expressed in percentages or other multipliers and were converted where possible to mills. Each of the five municipalities were contacted by telephone to confirm that the tax rate by-law was interpreted correctly.

Table 1 below summarizes the mill rates for each of the five municipalities.

TABLE 1: PROPERTY TAX RATES FOR AIRPORTS RANKED IN ASCENDING ORDER

MUNICIPALITY AND AIRPORT	PROPERTY TAX CATEGORY	Property Tax Rate
Regional Municipality of Wood Buffalo (Fort McMurray Airport)	Urban Non-Residential (Commercial)	11.9632 mills
Mackenzie County (High Level Airport)	Non-residential	16.608 mills
Town of Edson (Edson Airport)	Non-residential	17.1170 mills
Woodlands County (Whitecourt Airport)	Non-Residential (Commercial)	19.2883 mills
Town of Slave Lake (Slave Lake Airport)	Non-residential	20.6342 mills
Municipal District of Peace (Peace River Airport)	Non-residential	22.7521 mills

NOTE: Different mill rate additions may apply to airport properties based on designation; for example, the Designated Industrial Property mill rate may only apply to a subset of the commercial properties at airports. The property tax mill rates in Table 1 are based on available information on downloadable version of by-laws uploaded to the internet and interpretations by tax clerks contacted within each municipality. The rates above may not reflect true property tax mill rates being charged at these airports.

Additional observations are recorded below:

1. All five municipalities contacted confirmed that applicable tax rates on airport lands, which are predominantly commercial and industrial, are no different than the commercial and industrial rates charged to properties outside of the airport.
2. The zoning, or land use classification, of a land parcel dictates the permissible uses of the land. The zoning of a property does not directly impact the property tax rate; the rate is based on the actual land use of the property. Zoning therefore has an indirect impact on the property tax rate. In the land use by-laws for the five municipalities, airport lands, including Whitecourt Airport, were predominantly zoned as a special “Airport” land use, with the exception of Peace River, which was zoned agricultural, and Slave Lake, which was zoned industrial.
3. The commercial property tax mill rate at Woodlands County falls between that of the airport’s two main competitors, Edson Airport (Town of Edson) and Slave Lake Airport (Town of Slave Lake). At 19.2883 mills, the Woodlands County commercial tax mill rate is more than the Town of Edson (17.117 mills) and less than the Town of Slave Lake (20.632 mills).

WHITECOURT AIRPORT TAX RATE

With assistance from Woodlands County staff, the property tax rate for properties at Whitecourt Airport was further examined. Land at the Whitecourt Airport is subject to the property tax rates set out in the Woodlands County property tax by-law. The currently occupied properties on the airport grounds are all classified as non-residential, or commercial, land. It was found that the commercial property tax rate for lands on the airport were no different from the one that applies to commercial lands in the rest of the lands subject to the Woodlands County property tax by-law.

The property tax rate in place for commercial properties at Whitecourt Airport are comprised of the Woodlands County’s general municipal rate (11.1716 mills), the ASFF rate (3.9490 mills), the Opted Out School Boards rate (3.9490 mills), and the Lac Ste. Anne Seniors Foundation rate (0.2187 mills) for a total property tax mill rate of 19.2883 mills. The property tax by-law includes an industrial mill rate addition; however, this rate does not apply to currently occupied properties at the airport and is mostly applied to oil and gas industry outside of the airport. Because the Airport does not have any light industrial activity, no airport properties have the industrial mill rate applied to their property tax mill rate.

Table 2 lists the Woodlands County general municipal property tax mill rate for airport non-residential (commercial) properties for the years 2013 through 2020. The general municipal mill rate was observed to have significantly increased between the 2013-2014 and 2019-2020 tax years. The most likely reason for these marked increases, according to Woodlands County staff, are increases in the anticipated costs, amounts, or variety of municipal services provided by the County to its residents. Consequently, these increases would require an increased property tax mill rate to raise the required funds for the provision of these services.

TABLE 2: WOODLANDS COUNTY PROPERTY TAX MILL RATES FROM 2013-2020 (LESS SCHOOL AND SENIOR FOUNDATION MILL RATE ADDITIONS)

YEAR	COMMERCIAL TAX RATE	% CHANGE FROM PREVIOUS YEAR
2013	8.6654 mills	N/A
2014	9.5654 mills	+10.39%
2015	9.7749 mills	+2.19%
2016	9.7749 mills	+0.00%
2017	9.8726 mills	+ 1.00%
2018	10.1194 mills	+2.50%
2019	10.3724 mills	+2.50%
2020	11.1716 mills	+7.71%

ASSESSED VALUE OF EDSON AIRPORT AND SLAVE LAKE AIRPORT

WSP was asked to investigate the amount and assessed value of commercial lands at Edson Airport and Slave Lake Airport. Findings of the investigation are included below.

EDSON AIRPORT

On behalf of the Town of Edson, Compass Assessment Consultants provided property information for commercial lands at Edson Airport, summarized in Table 3 below. Based on the information provided, of the 18 properties for which information was available, five (5) were concluded to be developed on-airport commercial properties and nine (9) were concluded to be vacant on-airport commercial properties. The total value per acre for all commercial properties at Edson Airport was calculated to be $305,836 / acre.

TABLE 3: SUMMARIZED COMMERCIAL PROPERTY VALUE INFORMATION FOR EDSON AIRPORT

LAND USE CATEGORY	TOTAL AREA	LAND VALUE	TOTAL VALUE	TOTAL VALUE PER ACRE
Airport Developed Property (5)	2.88 acres	$241,200	$1,088,450	$377,927 / acre
Airport Vacant Property (9)	1.38 acres	$214,830	$214,830	$155,526 / acre
All commercial land (14)	4.26 acres	$456,030	$1,303,280	$305,836 / acre

SLAVE LAKE

With the assistance of the Town of Slave Lake, the Town's Assessment Roll 2019 for 2020 Tax Year document was obtained. The assessment roll document contained limited property information, including property addresses, land use designation and property assessed values. An estimate was made as to which properties were associated with the airport. No land area or acreage values were provided in the Assessment Roll.

The Slave Lake Airport had 12 developed on-airport commercial-industrial properties, with a total land value of $215,700 and total improvement value of $2,083,400 for a total assessed overall value of $2,299,100. The Slave Lake Airport also had 4 vacant on-airport commercial-industrial properties worth $52,400.

Table 4 summarizes the total property values per acre for Edson, Slave Lake and Whitecourt Airports.

TABLE 4: SUMMARIZED COMMERCIAL PROPERTY VALUE PER ACRE INFORMATION FOR EDSON, SLAVE LAKE AND WHITECOURT AIRPORTS

AIRPORT	TOTAL VALUE PER ACRE
Edson Airport	$305,836 / acre
Slave Lake Airport	NOT AVAILABLE
Whitecourt Airport	$350,000 / acre

CONCLUSION

Woodlands County requested WSP conduct interviews with additional stakeholders and conduct a property tax assessment.

Multiple themes emerged during the interviews, including the present lack of conflict between fixed and rotary wing operators, high lease and property tax rates, security challenges, seasonal drainage and flooding, and minor issues such as snow removal and aging airport infrastructure.

Woodlands County's non-residential (commercial) mill rate was observed to fall roughly in the middle of the range established by researching the tax rates of five other municipalities. The commercial property tax mill rates at Woodlands County was observed to have increased drastically between the years 2013-2014 and 2019-2020. A likely reason is due to increased demand of municipal services, thereby increasing the amount of money requisitioned of the tax base in the County. There may be an argument to suggest that commercial activities on airport are more harshly taxed because, although the land may be appraised at a similar value to off airport properties, they may not receive the same level of benefit from municipal services. None of the municipalities researched had different tax rates for lands on airport as compared to commercial properties located off airport, meaning that there was one non-residential property tax mill applied to commercial use irrespective of property location.

The Town of Edson provided commercial property value information through an assessment consultant. The developed on-airport commercial properties had a total calculated value of $277,927 / acre and the vacant on-airport commercial properties were calculated to be $155,526 / acre, with a total overall value of $305,836 / acre. The Town of Slave Lake provided some limited information regarding property values. The total value of commercial-industrial sites was $2,299,100 for occupied land only and $2,351,500 for both occupied and vacant land.

Some limitations were noted based on this property tax and property value study:

- Different mill rate additions may apply to airport properties based on use and designation; for example, a Designated Industrial Property mill rate may only apply to a subset of the commercial properties at airports.
- Property tax mill rates are based on available information in public versions of municipal property tax by-laws and their interpretation by tax clerks contacted within each municipality. The values listed in this report may not reflect true property tax mill rates in effect for the airport properties.
- It was estimated which Slave Lake properties in the Assessment Roll fell on Slave Lake Airport grounds due to limited information available. As such, the listing of properties and calculation of total assessed property values may not reflect true total values and conditions.
- No acreage values were provided for the Slave Lake Assessment Roll; as such, an assessed land value per area metric was unable to be established for comparison with Whitecourt Airport.

RESOURCES CONSULTED

Mackenzie County. (2020). Bylaw No. 1141-19. Retrieved from https://docs.mackenziecounty.com/docushare/dsweb/Get/Document-39592/Bylaw%201141-19%20-%202019%20Tax%20Rate.pdf.

Municipal District of Lesser Slave River. (2020). Community Information Bulletin: Assessment & Taxation May 1, 2020. Retrieved from https://www.mdlsr.ca/component/edocman/2020-municipal-tax-rate-information-bulletin/viewdocument/622?Itemid=0.

Municipal District of Peace. (2020). Assessment and Taxation. Retrieved from https://mdpeace.com/municipal-district-office/departments/administration/financial/assessment-and-taxation/.

Municipal District of Yellowhead. (2019). 2019 Taxation Bylaw. Retrieved from https://yhcounty.ca/bylaws/2019-taxation-bylaw/.

Regional Municipality of Wood Buffalo [RMWB]. (2020). Bylaw No. 20/012. Retrieved from https://www.rmwb.ca/en/mayor-council-and-administration/resources/Documents/taxratebylaws/2020-tax-rate-bylaw.pdf.

Town of Edson. (2020). Taxation and Assessment. Retrieved from https://www.edson.ca/departments/corporate-services/taxation-assessment.

Town of High Level. (2020). Town of High Level 2020 Tax Rate Bylaw Bylaw No. 1002-20. Retrieved from https://www.highlevel.ca/DocumentCenter/View/1733/1002-20-2020-Tax-Rate-Bylaw-PDF.

Town of Peace River. (2020). Town of Peace River Request for Decision Proposed 2020 Tax Rate Bylaw 2071. Retrieved from https://peaceriver.civicweb.net/document/80001/2020%2004%2023%20RFD%20re%202071%20Tax%20Rate%20Bylaw.pdf?handle=754D6A2C92E045AE91D6B3D5B006001A.

Town of Slave Lake. (2020). Assessment Roll. Retrieved from https://www.slavelake.ca/DocumentCenter/View/3640/2019-Assessment-for-the-2020-Tax-Year.

Town of Slave Lake. (2020). Town of Slave Lake Bylaw No. 08-2020. Retrieved from https://www.slavelake.ca/DocumentCenter/View/4845/Bylaw-08-2020-Tax-Rate-Bylaw.

Town of Whitecourt. (2020). Taxes & Assessment. Retrieved from https://www.whitecourt.ca/Services/Taxes-Assessment.

Woodlands County. (2020). Woodlands County 2020 Property Tax Bylaw No. 551/20. Retrieved from https://woodlands.ab.ca/wp-content/uploads/2020/05/Bylaw-551-Tax-Rate-Bylaw-2020.pdf.

WOODLANDS COUNTY

WHITECOURT AIRPORT
2020 MASTER PLAN UPDATE

FINAL REPORT

WHITECOURT AIRPORT

2020 MASTER PLAN UPDATE

WOODLANDS COUNTY

FINAL REPORT

PROJECT NO.: 20M-00071-00
CLIENT REF: AB-2019-05753
DATE: SEPTEMBER 17, 2020

WSP
SUITE 300
2611 QUEENSVIEW DRIVE
OTTAWA, ON, CANADA K2B 8K2

T: +1 613 829-2800
F: +1 613 829-8299
WSP.COM

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 EXECUTIVE SUMMARY

The following report was prepared for Woodlands County as the final deliverable to the project described in the October 2019 Request for Proposal (RFP) titled “Woodlands County Airport Master Plan”. The RFP sought to obtain the services of a consultant to update the Airport’s current master plan, which was completed by Airbiz as a separate project in 2013. The master plan update was completed in comprehensive consultation with airport tenants and stakeholders, air carriers, the Airport Advisory Committee, airport staff, NAV Canada, and possible ownership partners.

The document focuses on eight areas: economic impact analysis; airport development; stormwater management; rotary and fixed wing conflicts; ownership options; airport approach lands; airport certification; and marketing plans.

Objectives for this master plan update included:

- Provide a roadmap for airport development primarily in the short- to medium-term (5-10 years) and outline immediate next steps to pursue;
- Point the airport in the direction that would allow it to achieve its strategic goals efficiently;
- Provide further explanations and details, as well as to fill gaps for concepts presented in the 2013 Airbiz Master Plan; and
- Provide innovative solutions to enduring challenges historically faced at the Airport.

The project had two main tasks: conducting stakeholder consultation to obtain input from key parties associated with the airport and researching and preparing a master plan update that would touch on the eight focus areas listed in the RFP and WSP’s proposal.

A summary of key findings and recommendations is listed below:

1. **Socioeconomic Analysis:** Whitecourt Airport provides a variety of tangible economic benefits to Woodlands County, Town of Whitecourt, Town of Fox Creek and Municipal District of Greenview. In total, spanning across direct, indirect and induced benefits, the airport was found to contribute 173 full-time equivalent jobs, a labour income of $19,129,580 and a contribution of $13,574,817 in Gross Domestic Product (GDP).

   Recommended next steps include:

   - In the short-term, share economic impact information with Woodlands County, Town of Whitecourt, Town of Fox Creek and Municipal District (MD) of Greenview.
   - In the medium-term, prepare an updated economic impact assessment.

2. **Airport Development:** Opportunities for revenue generation focus on supporting the oil and gas, forestry and other existing industries in the area and strengthening aviation related activities. New commercial development at the airport could include aircraft maintenance/repair/overhaul (MRO) and fixed base operator (FBO) tenants; light industry and business parks; and novel industry and energy industries.

   Recommended next steps include:

   - In the short-term, re-establish fuel service at the airport and review airport rates and charges to be in line with comparable competing airports.
   - In the short-term, advance land development opportunities (highway commercial, light industrial).
   - In the short-term, review the 2014 Master Plan and identify phasing, rough order of magnitude (ROM) costing and additional studies needed for desired redevelopments.
   - In the medium-term, pave high-traffic airside routes.
   - In the medium-term, create separate fixed-wing and rotary-wing taxiways and establish dedicated rotary-wing landing areas.

3. **Stormwater Management Plan Review:** The 2013 Stormwater Management Plan by Pasquini and Associates was reviewed and alternative recommendations were provided. A series of stormwater infrastructure, including stormwater facilities, culverts, drainage improvements and treatment of contaminated run-off was recommended with a combined rough order of magnitude cost of $6,600,000.

   Recommended next steps include:

   - In the short-term, clean and widen existing stormwater ditches.
   - In the medium-term, design and construct stormwater facilities in advance of preparing lands for commercial development.

4. **Fixed vs. Rotary Wing Conflicts:** Stakeholder consultation revealed tensions between rotary-wing and fixed-wing aircraft operators. Primary causes identified were a lack of airmanship and professional conduct, physical separation between land uses, communication, local procedures and enforcements; and excessive airborne Foreign Object Debris (FOD). A range of operational and infrastructure recommendations were provided in order of increasing cost and effort to help resolve potential conflicts.

Recommended next steps include:

- In the short-term, establishing a data collection and reporting system, increased reporting and airside surveillance and creation of standard operating procedures.
- In the medium-term, paving of gravel airside movement areas.

5. **Ownership Options:** A range of airport governance models were examined, ranging from private ownership and/or sale of the airport to airport authorities and public-private joint ventures. Stakeholder consultation identified there was interest in further investigating the possibility of sharing ownership of the Whitecourt Airport with partners, such as the Town of Whitecourt Town of Fox Creek and MD of Greenview. An airport commission was identified as a preferred governance model if partnership is pursued.

   Recommended next steps include:

   - Establishing an Airport Commission with representation, based on financial contribution, from Woodlands County, Town of Whitecourt, Town of Fox Creek and MD of Greenview.

6. **Airport Approach Lands:** At present, Whitecourt Airport is protected from adjacent and nearby incompatible development through municipal planning tools, which deter but do not completely resolve the risk of these land uses affecting the continued safe operation of the airport. The implementation of AZRs following the federal-provincial process, along with an AVPA by-law focused on noise, is the recommended solution to provide additional future protection to the airport. To pursue AZRs, the airport will need to remain certified.

   Recommended next steps include:

   - In the short-term, implement an Airport Vicinity Protection Area (AVPA) plan.
   - In the medium- to long-term, implement Airport Zoning Regulations (AZRs).

7. **Certification Review:** Despite increased administrative requirements and operational costs associated with maintaining certification, it is recommended Whitecourt Airport remain a certified airport rather than surrendering the certificate and becoming a registered aerodrome. The loss of certification would restrict opportunities for scheduled commercial service.

Recommended next steps include:

- Retain the airport's certification status.

8. **Marketing Plans:** The preliminary marketing strategy provides a starting point for stakeholder engagement and the development of a full Whitecourt Airport marketing plan. A number of marketing recommendations are provided for the areas of commercial development and air service development. The highest priorities are: the addition of value-added amenities such as fuelling services; increased online presence and exposure to the local community and aviation industry through a dedicated airport website and social media accounts; reviewing land lease rates to be more competitive with comparable airports; and undertaking a travel demand study to support efforts to attract scheduled passenger air service.

   Recommended next steps include:

   - In the short-term, undertake a marketing program that includes increased airport exposure through a dedicated website and social media and increased coordination with regional economic development initiatives.
   - In the medium-term, when air travel returns to near pre-COVID levels, undertake an air travel demand study and assess opportunities for scheduled commercial air service.

2 INTRODUCTION

2.1 BACKGROUND

The following report was prepared for Woodlands County as the final deliverable to the project described in the October 2019 Request for Proposal (RFP) titled “Woodlands County Airport Master Plan”. The RFP sought to obtain the services of a consultant to update the airport’s current master plan, which was completed by Airbiz as a separate project in 2013. The master plan update would be completed in comprehensive consultation with airport tenants and stakeholders, air carriers, the Airport Advisory Committee, airport staff, NAV Canada, and possible ownership partners. The document would focus on eight areas: airport development, topography and drainage; rotary and fixed wing conflicts; ownership options; airport approach lands; airport certification and marketing plans.

WSP, as the successful proponent, set out multiple objectives for this master plan update project:

- To provide a roadmap for airport development primarily in the short- to medium-term (5-10 years) and outline immediate next steps to pursue;
- To point the airport in the direction that would allow it to achieve its strategic goals efficiently;
- To provide further explanations and details, as well as to fill gaps for concepts presented in the 2013 Airbiz Master Plan; and
- To provide innovative solutions to enduring challenges historically faced at the airport.

The project had two main tasks: conducting stakeholder consultation to obtain input from key parties associated with the airport and researching and preparing a master plan update that would touch on the seven focus areas listed in the RFP and WSP’s proposal.

In the preparation of the report, WSP drew on the diverse pool of experts working at WSP, including the Ontario-based Aviation Planning and Advisory team, the Edmonton-based Water Resources team and an Ontario-based economist. WSP drew upon the team’s experience from similar consulting assignments at other Canadian airports, including Grande Prairie, Edmonton and Mackenzie County airports. The conclusions and recommendations made throughout the report were supported by knowledge of airport and aviation industry trends, in areas ranging from facility development to Remotely Piloted Aircraft Systems (RPAS). The recommendations were also supported by figures and products of analysis, such as the socioeconomic impact figures, the

financial impacts of decertification and the rough order of magnitude costing of off-airport land use protection options. Where possible, recommendations were summarized with infographics or tables.

2.2 STAKEHOLDER ENGAGEMENT

Over the course of two days, WSP conducted virtual telephone consultations with a number of airport tenants and stakeholders. Stakeholders contacted for an interview included airport staff, air carriers, fire suppression tanker base, NAV Canada, COPA, Town of Whitecourt personnel, Woodlands County personnel, Fox Creek personnel and MD of Greenview personnel. Of the airport tenants, the following parties were interviewed: Airborne Energy Solutions, Rotaiva Fuels, Taiga Helicopters, Pipistrel Aircraft, Highland Helicopters, HeliSource and two private general aviation operators. The Woodlands County Director of Infrastructure and Whitecourt Airport Manager were two staff interviewed in relation to the airport. Personnel from the fire base, NAV Canada Flight Service Station (FSS) and the local COPA Flight 185 were interviewed. A representative of the Town of Fox Creek was also interviewed. Finally, the Chevron Corporation was interviewed as well. Personnel from the Town of Whitecourt and MD Greenview were unavailable for interview, along with the two air carriers contacted, Sunwest Aviation and Central Mountain Air.

Trends from the stakeholder consultation indicated the lack of fueling service is detrimental to airport tenants and may play a role in dissuading historical general aviation users and visitors from using the airport; the lease rate structure may need to be reviewed for competitiveness; and airport tenants could greatly benefit from amenities and services such as both airside and groundside paving, timely snow clearing and proper drainage on their leased lands.

Many of the conclusions and recommendations provided in the following report are based on the information gathered and analyzed from the interviewed stakeholders.

3 ECONOMIC IMPACT ANALYSIS

3.1 INTRODUCTION: WHY MEASURE “ECONOMIC IMPACT”

The Whitecourt Municipal Airport serves many roles. It is a key part of the supply chain that keeps the natural gas wells of the Duvernay Formation in production. As an important base for the Alberta Sustainable Resource Development, it plays a critical role in protecting Alberta’s forestry resources. It has a helicopter training school, creating long-term benefits for Canada and the world. When fuel was available for purchase, the airport historically served as a stopping point for aircraft flying between Alaska and the lower 48 states.

Whitecourt Airport is an important part of the regional economy, including Woodlands County, the Town of Whitecourt, the Town of Fox Creek and the Municipal District (MD) of Greenview. The airport’s ongoing economic contribution is important for justifying proposed capital expenditures and prioritizing County investments.

An airport’s profitability, as reported on its income statement, is usually a poor measure of its economic significance because it fails to capture the wider socioeconomic benefits an airport generates throughout the community. The data presented in an economic impact assessment provides decision makers with an understanding of the economic value the airport brings to the region, which in turn supports decisions regarding airport investment.

3.2 ECONOMIC IMPACT DEFINED

All economic impact assessments go beyond the immediate financial statements of a facility or project and measure how they affect the economy at large. The “economic impact” can be expressed in many ways, including:

- Employment;
- Wages, salaries and benefits;
- Business revenues, investment and spending;
- Gross domestic product; and,
- Municipal, provincial and federal taxes.

Most economic impact studies use the following three metrics:

- Employment: Number of employees, expressed in full-time equivalents (FTE);
- Labour Income: Total dollar value of salaries and benefits; and
- Gross Domestic Product (GDP): A macroeconomic measure of the total economic benefits less the costs; the value of a company's production after subtracting all intermediate costs.

Economic benefits can be categorized as direct, indirect, or induced benefits. In the case of the Whitecourt Airport, "direct" benefits arise on the airport site through the activities of entities located on the airport, such as flight training, commercial aviation, and land leases. The "indirect" benefits occur off-site, such as local services supporting the airport tenants. The "induced" benefits transpire through increases in household expenditures.

3.3 METHODOLOGY

The first step in such in conducting is to assemble a comprehensive profile of each entity located and operating out of the airport, using the following data:

- Total employment in person-year equivalents;
- Total wages, salaries and benefits;
- Company revenues;
- On-site purchases of goods and services;
- Off-site purchases of goods and services; and
- Average capital expenditures per year.

Through stakeholder consultations and working with airport management, an economic profile and the number of full-time equivalent employees was collected. Supplemental information was obtained from Statistics Canada[1] and several industry studies[2] to supplement the collected data and the calculation of the direct benefits of the Whitecourt Airport.

An input-output analysis was used for this economic impact assessment, which created a series of "multipliers" to show the flow of goods and services between industries. This series of multipliers can, in combination with direct benefits, generate estimates of the indirect and

[1] Statistics Canada, Output, by sector and Industry, provincial and territorial (x 1,000,000)
Table: 36-10-0488-01 (formerly CANSIM 381-0031); Statistics Canada "Employee Wages by Industry, annual" Table 14-10-0064-91; Statistics Canada "Gross Domestic Product at basic prices, by sector and industry, provincial and territorial Table 36-10-0487-01.
[2] Intervistas "Economic Footprint of the Canadian Helicopter Industry", May 2016; NAV Canada Annual Report May 2019.

induced expenditures. Statistics Canada, in cooperation with the Alberta Treasury Board, produces a comprehensive input-output model of the nation and the province[3], called the Alberta model, which was used in this analysis.

3.4 ECONOMIC IMPACT OF THE WHITECOURT AIRPORT

The airport and its tenants directly provide 89 full-time equivalent (FTE) jobs. The total employment stimulus, including indirect and induced effects, is 173 FTE jobs. It directly generates over $10.5 million CAD in labour income, and a total of $19.1 million CAD when indirect and induced impacts are considered along with the direct effects. The direct gross domestic product (GDP) benefit is $6.0 million CAD per year and the total GDP benefit is $13.6 million CAD per year. Table 3.1 summarizes the economic impact of the Whitecourt Airport.

Table 3.1 - Economic Impact of the Whitecourt Airport

	TYPE OF IMPACT			
	Direct	Indirect	Induced	Total
Employment (FTE)	89	55	29	173
Labour Income	$10,520,741	$6,283,970	$2,324,869	$19,129,580
Gross Domestic Product	$6,048,453	$4,864,535	$2,661,829	$13,574,817

Note: Monetary figures are presented in Canadian Dollars (CAD).

Airport tenants did not have information on capital expenditures. The following analysis in Table 3.2 examines the economic impact of a hypothetical project of $100,000 of private investment undertaken by any airport business.

[3] Alberta Economic Multipliers 2013, Alberta Treasury Board 2017.

Table 3.2 - Economic Impact of Capital Expenditures at the Whitecourt Airport

	TYPE OF IMPACT			
	Direct	Indirect	Induced	Total
Employment	0.48	0.30	0.80	1.58
Labour Income	$31,562	$17,691	$7,836	$57,089
Gross Domestic Product	$10,800	$6,762	$4,180	$21,742

Note: Monetary figures are presented in Canadian Dollars (CAD).

This project would generate 0.5 direct jobs and 1.6 combined direct, indirect and induced jobs. The direct labour income would be $31,600 CAD, and $57,100 CAD when combined. The direct impact on GDP would be $10,800 CAD and a direct / indirect / induced impact would be $21,700 CAD. All benefits are directly proportional to the size of the project. An investment of $700,000 would result in benefits of seven times each entry in Table 2.2. The majority of supplies and labour would likely originate from the local region, including Woodlands County, the Town of Whitecourt, Fox Creek and MD of Greenview.

3.5 OTHER ECONOMIC BENEFITS

Economic impact analyses sometimes tend to overlook intangible, company-specific dynamics and benefits. The businesses at Whitecourt Airport are heavily involved in the development of regional natural resources, including forestry, the Duvernay natural gas formation and other activities within Woodlands County, Whitecourt, Fox Creek and Greenview. These businesses and the Whitecourt Airport may lower the costs of harvesting natural resources, accelerate the completion of extractive infrastructure and even allow the development of facilities that would otherwise be unfeasible. These benefits, however large, are not considered in the economic impact of the airport.

The Alberta Sustainable Resource Development helps to conserve Alberta's forest industry. By combatting forest fires, great benefits are generated to communities in the province including protection of property and transportation arteries as well as the preservation of natural resources. These operations also reduce carbon emissions that are a by-product of forest fires. Since the Alberta Sustainable Resource Development is not financially compensated for these benefits, the socioeconomic impact of this tenant and the airport is understated.

The Whitecourt Airport has also historically accommodated out-of-town visitors, including aircraft flying between Alaska and the lower 48 states. Many visitors have stayed in local hotels and purchased food, beverages and other supplies in the area. Their payments contribute directly to hotel, restaurant and retail employment and revenues, leading to indirect and induced expenditures and employment. Since this economic impact study considers only airport tenants, it excludes the benefits of out-of-town visitors who use the airport and spend money in the community.

3.6 CONCLUSION

This socioeconomic impact analysis has examined the benefits that the Whitecourt Airport provides to Woodlands County, the Town of Whitecourt, the Town of Fox Creek and MD of Greenview. Both direct impacts, such as full-time equivalent jobs and gross domestic product contribution, as well as indirect impacts, such as benefit to developing the Duvernay Formation, facilitating the forestry industry and protecting forests from fires, were explored. It was found that the economic impact is in excess of $19M CAD of labour income, $13M CAD GDP and 173 full-time equivalencies of employment. Each $100,000 spent on airport projects could create 1.6 combined jobs, $57,100 CAD of labour income and $21,000 in GDP.

3.7 NEXT STEPS

Table 3.3 provides recommended next steps.

Table 3.3 - Economic Impact Assessment Next Steps

ECONOMIC IMPACT	NEXT STEPS
Short Term (1 to 5 Years)	• Present the economic impact information to the councils of Town of Whitecourt, the Town of Fox Creek and MD Greenview in order that they can appreciate the economic value the airport brings to the region.
Medium Term (6 to 10 Years)	• Prepare an updated Economic Impact Assessment (EIA) to assess the economic impact of the airport against the base case.
Long Term (11+ Years)	• Periodically prepare updated EIAs

4 AIRPORT DEVELOPMENT

4.1 INTRODUCTION

To support the Whitecourt Airport, it is recommended that Woodlands County focus its efforts on viable development and revenue generating opportunities both airside and groundside. Development opportunities were identified in the previous Airport Master and the viability of these potential prospects is reviewed. Regional economic projects with the potential to induce new airport development are also examined. The section also introduces Canadian airport development and emergent trends. The most viable development opportunities provide the basis for the Preliminary Marketing Strategy (Section 10), where suggested marketing goals, opportunities, challenges, techniques and next steps are identified to build upon this section.

4.2 VIABILITY OF DEVELOPMENT OPPORTUNITIES IN 2014 AIRPORT MASTER PLAN

The Whitecourt Airport Master Plan dated May 2014 provided a number of development opportunities for consideration, including:

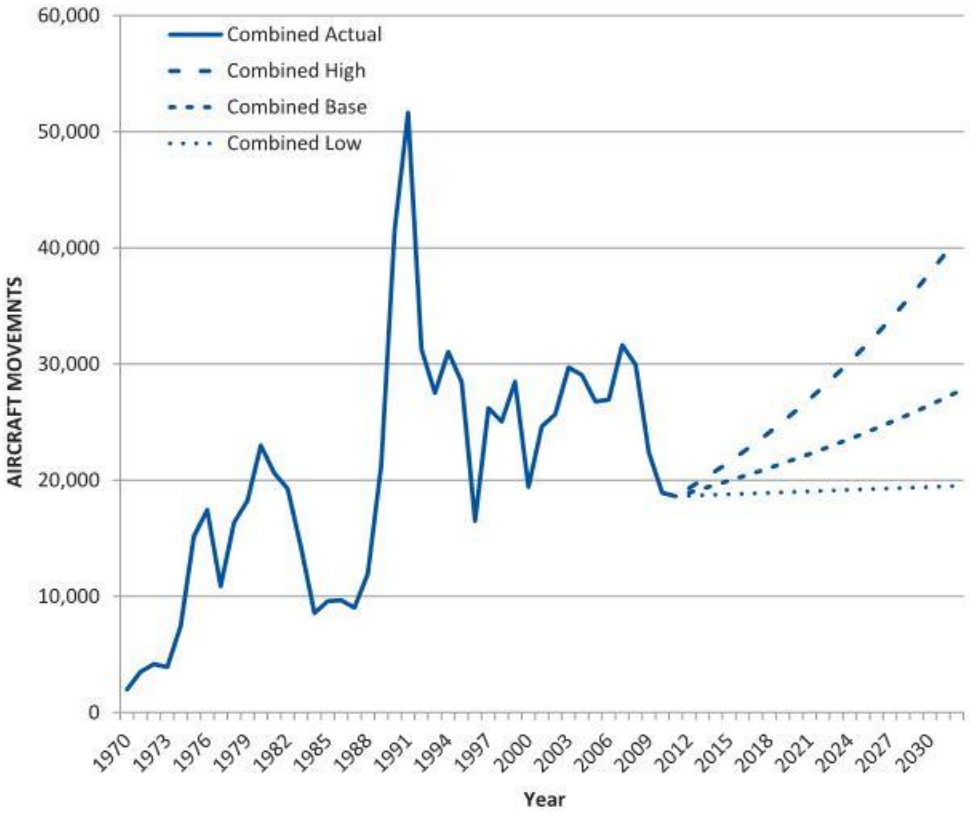
- Airfield System;
- Air Terminal Reserve;
- Airside Commercial and Residential Airpark;
- Light Industrial;
- Highway Commercial; and
- Recreational.

The conceptual airport development plan provided in the 2014 Master Plan relies on a phased approach to developing airport lands. The layout of land uses at the airport appears to be viable over the long term; however, the time frame of the phasing of all sections is unclear. The only reference to timing is in the vision, which is set in the year 2034. The phasing and implementation of timelines should be revisited, potentially through a revision of the airport development plan, to identify and organize development priorities. Development priorities may be aligned along the following horizons typical of a Master Plan: in short-term 5-year, medium-term 10-year and long-term 20-year planning intervals, or horizons. In most cases, the enhancement of existing facilities is recommended prior to beginning new developments. The plans outlined for the airport by Airbiz should not be viewed as

prescriptive in terms of layout or land use, but rather viewed as indicative of a potential concept and revisited with new opportunities as they arise.

4.2.1 AIRFIELD SYSTEM

A parallel taxiway is proposed as part of the future airfield system in the 2014 Master Plan. Ideally, the taxiway would be planned based on activity triggers such as reaching a certain threshold of aircraft movements. The International Civil Aviation Organization (ICAO) in their Airport Planning Manual suggest a parallel taxiway is required when annual movements reach 50,000 and/or when the total itinerant peak hour movement reaches 20. Based on the aircraft movement forecast provided in the 2014 Master Plan (Figure 4.1) the construction of a full parallel taxiway would not be required until well beyond the horizon of the Master Plan.



Source: Whitecourt Airport Master Plan, Airbiz, 2014

Figure 4.1: Aircraft Movement Forecast

As described in the plan, it is good practice to reserve land for the future development of the parallel taxiway once the development is viable. An advantage of the current airport layout is that a parallel taxiway could use the existing partial parallel taxiway to minimize new pavement and grading – the construction of the parallel taxiway would only require the extension of the existing taxiway to the northwest. Further studies will be required to determine feasibility and optimal phasing for the construction of the full parallel taxiway.

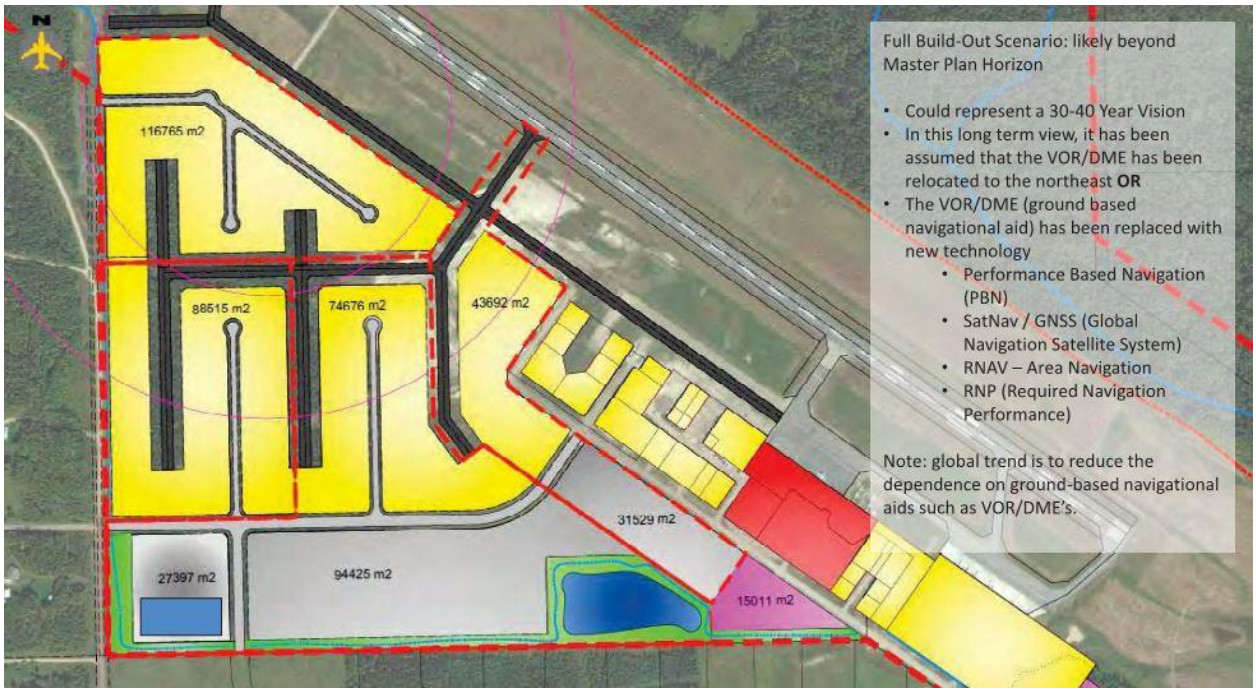
The 2014 Master Plan does not speak to any airside improvements to specifically benefit rotary-wing users. In the Fixed-wing and Rotary-Wing Review section (Section 5), improvements such as paving surfaces, creating separate fixed-wing and rotary-wing taxiways, establishing dedicated rotary-wing landing areas and relocating fixed-wing and rotary-wing users for greater separation are recommended. These recommendations may be considered alongside the proposed airfield system upgrades in the 2014 Master Plan.

4.2.2 AIR TERMINAL RESERVE

The 2014 Master Plan proposes the development of a new airport terminal building (ATB) to resolve challenges such as basement flooding. The plan sets aside lands surrounding the existing ATB, predominantly to the south, for the construction of a new ATB and larger parking area. Another alternative to consider, to avoid costly expenses such as demolition and rebuilding from the ground up, would be to repair the existing ATB, then expand and renovate it. It is recommended a structural assessment of the ATB be completed and further assess the facility needs and potential rehabilitation opportunities in the short term. An expansion of the ATB could be required to accommodate future passenger growth.

4.2.3 AIRSIDE COMMERCIAL AND RESIDENTIAL AIRPARK

The 2014 Master Plan proposes a significant enlargement of the airside commercial area (Figure 4.2) to the west of the existing airside facilities to accommodate airport businesses that need runway access, such as cargo and freight transportation. The layout of the airside commercial area provided in the master plan appears to be viable; however, repairs and improvement to existing airside commercial areas, to address stakeholder concerns such as drainage prior to the development of new areas, may be the most efficient next step.



Source: Whitecourt Airport Master Plan, Airbiz, 2014

Figure 4.2: Proposed Airside Commercial Development Area

The 2014 Master Plan also proposes a residential airpark on the western end of the extended airside commercial area. Residential style airparks have seen limited success in Canada compared to their popularity in the United States. This lack of interest in residential style airparks can likely be attributed to a relatively short recreational flying season and a considerably smaller GA consumer base. The concept should not be viewed as a significant revenue stream for the airport. Based on recent projections of general aviation demand nationally, upfront investment to service these lands ahead of an interested owner or lease is not warranted. This is not to suggest that a few lots will not be developed as such over time, but rather the approach to take is that of encouraging a flexible policy to airport land development that does not discount or curb the potential for a mix of development on airport property. Before planning an airpark, whether it be for residential or commercial purposes, further study is recommended to assess current and projected levels of demand, along with a comprehensive review for compatibility with existing Municipal Development Plans, Land Use By-laws and other planning documents in place. The current plans for the area should not be viewed as prescriptive in terms of layout or land use, but rather viewed as indicative of a potential concept and revisited with new opportunities as they arise.

4.2.4 LIGHT INDUSTRIAL

The development of the groundside commercial area with light industrial land uses is another feature in the 2014 Master Plan and would take place south of the proposed new airside commercial area. The concept of including provisions for light industry on airport lands is a widely adopted approach to increase revenue generation by providing space without access to the airside area for businesses that do not require it. The area and layout outlined in the Master Plan is viable concept and may be further subdivided for lease according to future tenant needs. Additionally, demand for light industrial lands should be reviewed and aligned with regional planning for this type of development.

4.2.5 HIGHWAY COMMERCIAL

The 2014 Master Plan briefly discusses a strategy to develop a highway commercial area near the entrance of the airport to create an employment centre around the airport (Figure 4.3). The concept takes advantage of the highway access and may further expand and diversify the businesses located at or near the airport. It may also help attract the general travelling public from the highway by making the airport into a destination beyond aviation activities. The highway commercial area is especially viable because it is in line with the proposed vision and guidelines for the area in the Municipal Development Plan, Land Use Bylaw and other municipal planning documents.

Source: Whitecourt Airport Master Plan, Airbiz, 2014

Figure 4.3: Proposed Highway Commercial Development Area

4.2.6 RECREATIONAL

The concepts provided in the 2014 Master Plan for recreational areas are further plans to make the airport into a destination and activity area. The section makes provisions for a trail network for walking, hiking, mountain biking and snowmobiling among other uses and is predominantly located northeast of the runway. The creation of a recreational trail network is viable with careful planning; however, some challenges would need to be addressed. Since a significant portion of the woodlot north and east of the airport was removed in early 2020, trail routes and types may need to be revisited in future planning stages. All structures and activities would need to be carefully assessed to ensure proper setbacks from the runway and clearance from the obstacle limitation surfaces. Parkland and recreational areas adjacent to airports face the challenge of remaining pleasant because of aircraft noise. Proper setbacks would help ensure that the current and future air traffic do not compromise the usability of the recreational space. Additional types of recreational spaces may be considered in areas further from the runway as well.

4.3 LOCAL AND REGIONAL DEVELOPMENT INTEREST

Stakeholder consultation provided valuable information about local development interests, which are described below and summarized in Figure 4.4 as ideas that could induce new growth, development and revenue at Whitecourt Airport. These developments may benefit the Whitecourt Airport by locating on airport lands and generating lease revenue for Woodlands County or establishing near the airport and potentially attracting compatible and supporting industrial tenants to airport property.

The integration of business parks and light industry into the areas immediately surrounding Whitecourt Airport could provide a revenue generator for Woodlands County that is compatible with the airport. It is understood that the County is currently in the process of preparing a business park study that may attract industry and office uses into the area. Further studies to assess the supply of and demand for business parks in collaboration with Woodlands County and the Town of Whitecourt may be warranted to further inform planning and development. Potential industrial uses may support the established oil & gas, agriculture, forestry and prefabrication sectors in the area and are the most likely to be successful in the current airport context. Woodlands County is encouraged to leverage relationships with existing oil and gas industry players in the area such as the Chevron Corporation, to potentially attract investment into the airport.

An interest in more novel industrial land uses was expressed for the area surrounding Whitecourt Airport. Recent developments have indicated a possible presence of geothermal

energy resources beneath Woodlands County, which may make geothermal plants a viable development. Furthermore, industries such as indoor agriculture, aquaculture, vertical agriculture and cannabis production may support the development goals of Woodlands County and provide a valuable source of revenue for the airport if located on airport lands. Additional studies and investigation may be warranted to ensure these novel industrial land uses are compatible with airport and aircraft operations. These types of developments may be compatible with an emergent business park or light industrial airport area and may be successful in the current airport context.

Although development in and around the airport would focus on industrial land uses, especially those that support the oil and gas sector, aviation education and simulator training may also be a valuable revenue-generating opportunity for the airport. Education may encompass fixed-wing, rotary-wing or remotely piloted aircraft systems (RPAS) flying and vehicles such as trucks or motorcycles. Simulators would support flying education by providing future pilots with facilities to use in their training.

A key industry that contributes significantly to the Woodlands County, Whitecourt, Fox Creek and MD of Greenview economies, as well as that of the broader region, is forestry. The Whitecourt Airport plays a crucial role supporting the forestry-related industry. This includes accommodating a fire base for aircraft monitoring and fighting wildfires. As a vital piece of the regional economy, the fire base and other forestry businesses in the area should be supported with the infrastructure needed to continue working safely and efficiently. Ancillary businesses may be supported in the area, which may create synergies with the fire base, such as firefighting equipment repair or manufacturing. Recreational developments that raise awareness of forestry and aerial firefighting may also be explored, such as an interpretive centre focused on water bombers or aerial firefighting and reconnaissance missions. As well, the possibility of testing the use of RPAS in wildfire detection and monitoring may be considered and investigated.

Finally, development of logistics operations may be a potential source of revenue for the airport. Cargo operations may support remote communities in northern Alberta or support shipping efforts to and from larger cities such as Edmonton and Calgary. Integration with the Torq Transloading Inc. Whitecourt Rail Terminal and partnership with the rail operators to facilitate the transshipment of goods from rail to air could also be examined for feasibility. Some interest was also expressed in RPAS delivery with a potential hub at Whitecourt Airport. Additional studies, risk assessments and cooperation in consultation with Transport Canada and NAV Canada as well as Woodlands County and the surrounding municipalities would be required to provide next steps for the development of such a system. Transport Canada continues to release new regulations and guidance material regarding commercial

RPAS operations – monitoring of these developments would help identify when an opportunity presents itself to establish RPAS operations at Whitecourt Airport or within Woodlands County.

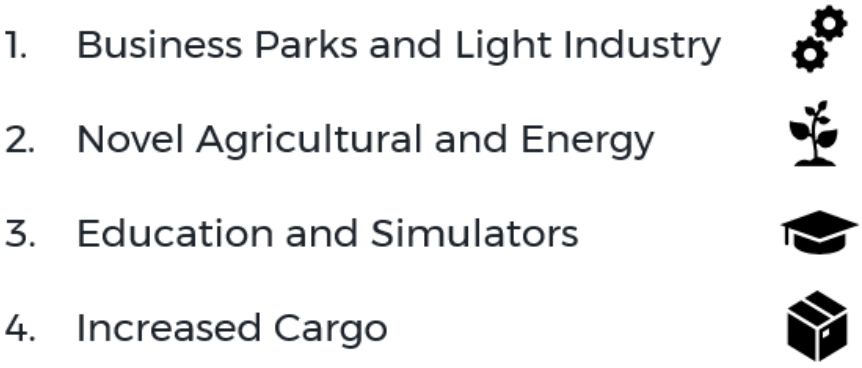


Figure 4.4: Local and Regional Development Interest

4.4 DEVELOPMENT TRENDS AT CANADIAN AIRPORTS

Throughout the process of identifying development and revenue opportunities, Whitecourt Airport and Woodlands County may look to other airports of similar size and scale across Canada to draw precedents and ideas. The trends discussed in this section are summarized in Figure 4.5.

Airports and the aviation industry in general continue to emphasize the importance of ancillary services and amenities being located at an airport for the convenience of airlines, charter companies and other airport users. Airports express a continuous desire to attract fixed and rotary wing maintenance, repair and overhaul (MRO) operators and fixed-base operators (FBO), which may provide a myriad of services including fueling, hangaring and the provision of aircraft parking areas. At present, the provision of amenities such as fueling services is likely to provide the highest value to the airport in the short term as it may attract more tenants and users who rely on these services in their operations. As well, the presence of services such as MROs and FBOs, or re-establishing fuelling services may increase the satisfaction of existing tenants, attract new tenants, and increase the airport's competitiveness among other airports.

Certain smaller airports in strategic locations brand themselves as "gateways to the north", emphasizing their ability to serve as a springboard to remote northern communities, some of which, are only accessible by air, and other northern destinations. Stakeholder consultation revealed that Whitecourt Airport was once a popular stopping point for aircraft flying between

the United States and Alaska. With the provision of amenities such as fuel, it may be possible to attract this air traffic again.

With current world events and the COVID-19 pandemic, international recreational travel and tourism has slowed considerably. There are indications that municipalities and airports across Canada are increasing the promotion of local travel destinations in a bid to attract more Canadians to tour domestically instead of internationally. For many areas, it is a key opportunity to showcase natural and/or cultural heritage and develop them into a revenue generator. Growth in local travel and tourism in smaller municipalities such as Woodlands County may draw more attention to the airport and may potentially attract more air traffic in the long term.

Airports have been accommodating relatively novel businesses and tenants that have not previously been associated with airports to promote the diversification of industries in the local area. Less conventional industrial uses such as breweries, cannabis processing facilities, solar farms and motorcycle training areas, as well as other uses that are not sensitive to aircraft noise have also been locating on airport properties or immediately nearby. For example, Edmonton International Airport houses a large cannabis facility, casino, racetrack and plans to develop a solar farm on airport lands, bringing in tens of millions of investment dollars to the area. Smaller airports such as Lake Simcoe Regional Airport, located in Ontario, have also developed a solar farm on airport property. As well, Vancouver International Airport houses an outlet mall located on airport lands. Highway commercial areas and business parks containing a variety of businesses have been developed along key corridors near airports to provide synergies with the airport and generate increased non-aeronautical revenues for the airport.

Figure 4.5: Development Trends at Canadian Airports

4.5 LAND LEASE RATES AND PRICING

At the request of Woodlands County, land lease rates at Whitecourt Airport were examined and compared to those of other aerodromes in Alberta, including Grande Prairie (CYQU), High Level (CYOJ), Lethbridge (CYQL), Red Deer (CYQF), Lloydminster (CYLL), Fort St John (CYXJ), Slave Lake (CYZH) and Edson (CYET).

At present, Whitecourt Airport's lease rate is an all-around $2.75 per square metre per annum and does not appear to present varying levels based on available amenities. **Whitecourt Airport land lease rates are also among the most expensive**, surpassed only by Lethbridge airside, High Level groundside and Red Deer serviced land lease rates. Apart from Edson airport, all other airports examined have stepped lease rate structures based on whether the lot has airside access or only groundside access, is serviced or un-serviced, and whether it is meant for private or commercial operations. During the stakeholder consultations, feedback was received from several parties that lease rates at Whitecourt Airport were expensive compared to nearby airports with a similar or greater provision of services and amenities.

It is recommended Whitecourt Airport review the land lease rate structure to ensure competitiveness and to remain an attractive option for businesses. A stepped fee structure would result in different land lease rates for different land lease arrangements. For example, the pricing could differ based on airside access, the size of the leased land, whether it is serviced or not, among other aspects. Different lease rates could apply for different tenants – private leased land not tied to business activity would have a different lease rate than land that is tied to a revenue and tax generating business with employees. A stepped fee structure should consider lease durations and lease terms at the exit and maturity stages.

4.6 CONCLUSION

This section has reviewed the concepts proposed in the previous Airport Master Plan from 2014, outlined local and regional development interest, examined development trends at airports across Canada and explored land lease rates at Whitecourt Airport. It is the intent that these revenue and development opportunities will provide Whitecourt Airport with a launching point to generate more revenue, address the needs of existing airport tenants and attract new airport tenants. The top three revenue and development opportunities, summarized in Figure 4.6, will form the basis of the Preliminary Marketing Strategy section. Table 4.1 summarizes the highest development priorities for investment, which were chosen for their ability to fit well within the airport context and potentially provide the highest value to the airport. Before any design or construction of these development opportunities occurs, it is

vital that these uses are reviewed against relevant plans and regulations, which may fall under municipal jurisdiction or federal jurisdiction. Municipal jurisdiction would include compatibility with municipal planning documents and building code compliance. Federal responsibilities would include compliance with the Canadian Aviation Regulations for matters pertaining to aviation safety such as obstacle limitation surfaces and wildlife management.

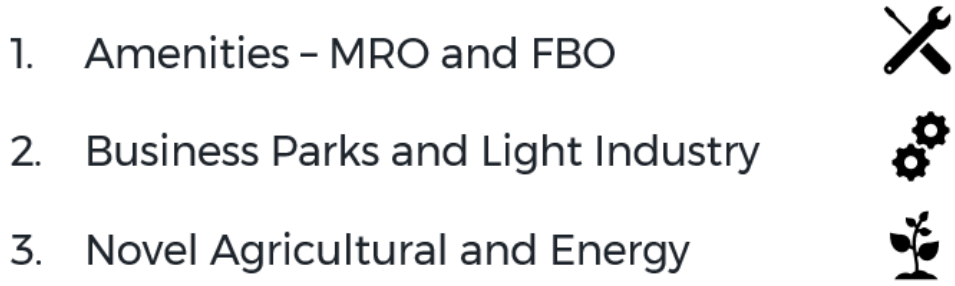


Figure 4.6: Top Three Short-term Revenue and Development Priorities for Preliminary Marketing Strategy

Table 4.1: Development Priorities and Implementation Timeline

IMPLEMENTATION TIME FRAME	DEVELOPMENT PRIORITY
Short term (5 years)	➢ Re-establish fuel service at the airport; ➢ Investigate opportunities for additional airport amenities (Fixed Base Operators, Maintenance / Repair / Overhaul operators); ➢ Review airport fees and rates; ➢ Initiate commercial development marketing plans as appropriate; ➢ Advance land development opportunities (highway commercial, light industrial); and ➢ Review 2014 Master Plan and identify phasing, rough order of magnitude (ROM) costing and additional studies needed for desired redevelopments.

Medium term (10 years)	➢ Pave high-traffic airside routes as an amenity for tenants; ➢ Create separate fixed-wing and rotary-wing taxiways; ➢ Establish dedicated rotary-wing landing areas; ➢ Implement 2014 Master Plan developments in accordance with phasing plans; and ➢ Initiate commercial development marketing plans as appropriate.
Long term (20 years)	➢ Relocate fixed-wing and rotary-wing users for greater separation as recommended; ➢ Implement 2014 Master Plan developments in accordance with phasing plans; and ➢ Initiate commercial development marketing plans as appropriate.

5 STORMWATER MANAGEMENT PLAN REVIEW

5.1 INTRODUCTION

The current stormwater drainage system based on the topographic survey and proposed Whitecourt Airport Conceptual Airport Development Stormwater Management (SWM) Plan by Pasquini and Associates Consulting Ltd. (Pasquini SWM Report) was investigated. The current plan and findings were found to be viable and it was concluded that no major changes are required. Consequently, this section builds upon the current plan and introduces alternative options for improvements of the drainage system for future development at Whitecourt Airport. The section also adds further context and parameters for airport stormwater management.

5.2 ANALYSIS

At the request of Woodland County, WSP investigated the current storm water drainage system based on the topographic survey data provided by the County and information within Whitecourt Airport Conceptual Airport Development Stormwater Management Plan (SWM) previously completed by Pasquini & Associates Consulting Ltd. The Whitecourt Airport SWM Plan Technical Memo is provided in Appendix A.

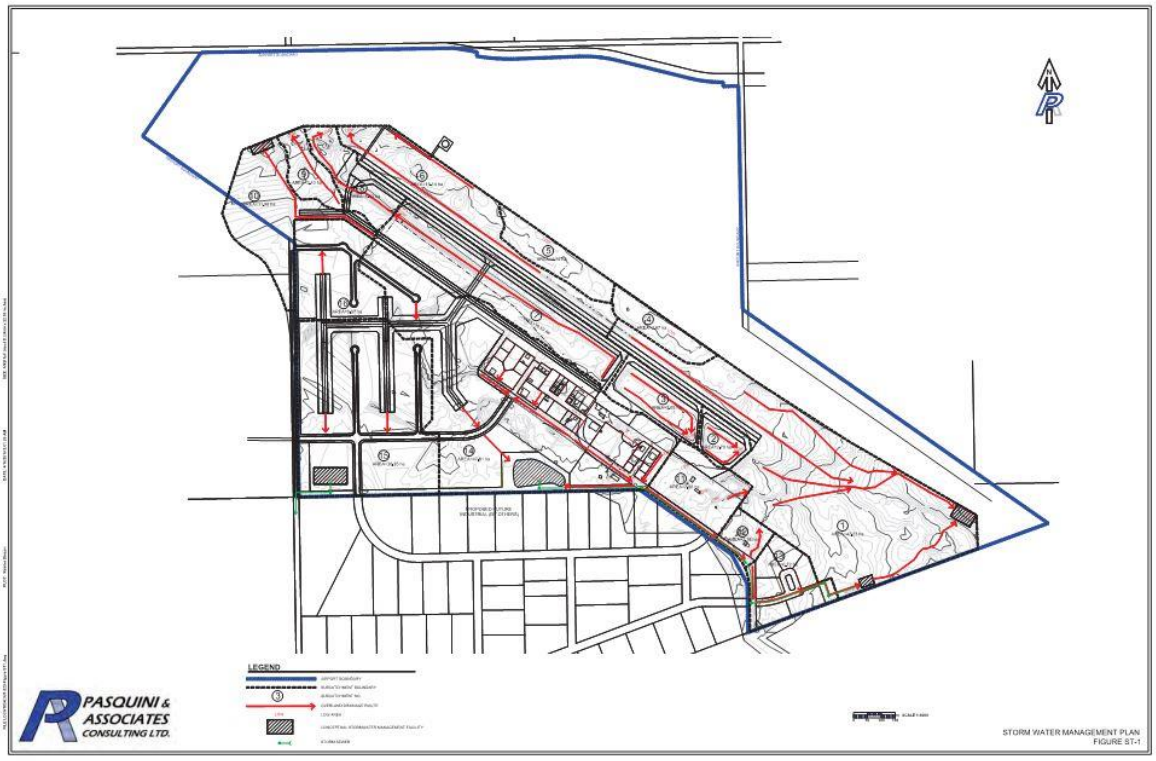
As mentioned in Pasquini SWM Report, future storm drainage infrastructure will be required to convey any on-site drainage to stormwater management facilities, which typically consist of wet ponds or dry ponds. Stormwater management facilities will be required to provide adequate flood protection by storing runoff, providing erosion control and controlling off-site discharge to an acceptable rate. If a stormwater management facility consists of a wet pond or a dry pond with a forebay, it will be required to facilitate minimum 85% removal of total suspended solids (TSS), therefore improving the water quality of discharge prior to release into the downstream stormwater conveyance system. A SWM plan also proposes major and minor systems for on-site stormwater management. The minor system consisting of storm sewer pipes, which provides a basic level of service, conveying runoff from low intensity from more frequent rainfall events; where the major system comprises of ditch, swales and local ponding areas that convey and store runoff when minor system exceeds the capacity during the high intensity from less frequent rainfall event. The proposed stormwater management plan will require an approval from appropriate authorities and should adhere to the following design guidelines:

- Part 5 of Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems (March 2013); and
- Stormwater Management Guidelines for the Province of Alberta (January 1999).

Based on the topographical information provided by the County, WSP reviewed the data to get a general understanding of the existing drainage flow path of the airport and surrounding landmarks. WSP was also able to gather rainfall Intensity-Duration-Frequency (IDF) data of 29 years (1982-2012) for the Whitecourt Area to calculate peak flow and runoff volumes for each catchment area mentioned in the Pasquini SWM Report.

The proposed development consists of Terminal Reserve, Airside Commercial, Light Industrial, Highway Commercial and Operational Reserve. To determine approximate peak runoff values and total 24-hour runoff volumes, assumed runoff coefficients and percent imperviousness were allocated to each land-use type.

WSP reviewed the suggested drainage boundaries and subcatchments areas as indicated in the Figure ST-1 (Figure 5.1) found in the Pasquini SWM Report provided in Appendix A. The concept stormwater management plan and specific findings of each subcatchment is highlighted below.



Source: Whitecourt Airport Conceptual Airport Development Management Plan, Pasquinni and Associates Consulting Ltd. 2014

Figure 5.1: Stormwater Management Plan

5.2.1 UNDEVELOPED SUBCATCHMENTS

Subcatchment areas that are not planned to be future developed are generally located north, northwest and southeast of the runway and will maintain the natural drainage patterns towards the off-site landmarks of the airport boundary.

Subcatchment #1

This catchment is approximately 42.23 ha, with a general high elevation determined from Lidar of 781.70m and a low spot of 762.70m. The catchment is about 5% impervious (runway) and 95% pervious (grasslands). Drainage from runway is directed into ditch along the northeast side, which drains from northwest of catchment towards the low point on southeast of the catchment at an approximate grade of 0.7% over 880m. The ditch bottom also has two culverts (10m and 12m) installed along the way. General grading of the catchment ranges from 0.1 – 1.4%, where it eventually drains to low point at the southeast corner of the airport boundary. The longest runoff path of the catchment is approximately 1450m. Some areas within the catchment may be considered for re-grading to ensure positive drainage towards the southeast corner, since these areas can be relatively flat with as low as 0.1% drainage slope.

As mentioned in the Pasquini SWM Report, the only developed area will be in the southeast corner of this catchment, which will have a major stormwater management facility to store upstream flow from catchment numbers 2, 3, 11, 12 and 13, prior to discharging the flow off-site. Furthermore, no future development is anticipated for this catchment as it is to remain as open space/recreational area. Total expected peak flow through this catchment would be approximately 8.0 m^3/s, with this catchment expecting to generate 33,000m^3 of runoff (including upstream catchment #'s 2, 3, 11, 12 and 13) during a 24-hour, 1 in 100-year storm event.

Note: Subcatchment #'s 11, 12 and 13 are proposed developed areas.

Subcatchment #2

This catchment is approximately 2.70 ha, with a general high elevation determined from Lidar of 781.1m, and a low spot of 778.0m. The catchment is about 30% impervious (runway), and 70% pervious (grasslands). Runoff from this catchment is collected within a central ditch, which drains from the northwest to the northeast at an approximate grade of 0.5% over 200m. Southwest and Northeast of the drainage ditch has a drainage slope of less than 0.5%, where re-grading is recommended to ensure adequate flow downstream. General grading of the catchment towards the drainage ditch ranges from 0.3 – 2.5%.

As mentioned in the Pasquini SWM Plan, there is no known culvert under the existing taxiway draining this catchment downstream towards catchment #1. This culvert is recommended to ensure the proper conveyance of storm runoff downstream, avoiding ponding in the low area of catchment. Furthermore, no future development is anticipated for this catchment. Total expected peak flow through this catchment would be approximately 1.1 m^3/s during the 1 in 100-year storm event.

Subcatchment #3

This catchment is approximately 5.63 ha, with a general high elevation determined from Lidar of 782.9m, and a low spot of 778.7m. The catchment is about 25% impervious (runway), and 75% pervious (grasslands). Runoff from this catchment is collected within a central ditch, which drains from the northwest to the southeast at a grade less than 0.5% over 400m. It is recommended that the drainage ditch should be re-graded to have a drainage grade of greater than or equal to 0.5% to allow adequate flow to the low area of the catchment. General grading of the catchment towards the drainage ditch ranges from 0.3 – 2.5%.

As mentioned in the Pasquini SWM Plan, there is no known culvert under the existing taxiway draining this catchment downstream towards catchment #2. This culvert is recommended to ensure the proper conveyance of storm runoff downstream, avoiding ponding in the low area of catchment. Furthermore, no future development of hard surfaces is anticipated for this catchment. Total expected peak flow of this catchment would be approximately 0.7 m^3/s during the 1 in 100-year storm event.

Subcatchments #4 and #5

These catchments have an approximate area of 3.67 ha and 4.75 ha respectively. These catchments are located on the northeast side of the runway and are 100% pervious (grasslands) area. The runoff from these catchments drains into off-site low area, which would eventually follow drainage patterns through the off-site landmarks to the east.

As mentioned in Airport Master Plan, no future development is anticipated for these catchments as it is to remain as open space/recreational area. Total expected peak flow through these catchments would be approximately 0.3 m^3/s for catchment 4, and 0.4 m^3/s for catchment 5 during 1 in 100-year storm event.

Subcatchment #6

This catchment is approximately 15.14 ha, with a general high elevation determined from Lidar of 782.7m and a low spot of 773.1m. The catchment is about 10% impervious (runway) and 90% pervious (grasslands). Drainage from runway is directed into ditch along the

northeast side, which drains from southeast of catchment towards the low point on northwest of the catchment at an approximate grade range of 0.4 – 4.6% over 1220m. The ditch bottom also has two culverts (10m and 12m) installed along the way. General grading of the catchment ranges from 0.5 – 3%, where it eventually drains to low point at the northwest corner of the airport boundary.

As mentioned in Airport Master Plan, no future development is anticipated for this catchment as it is to remain as open space/recreational area. Total expected peak flow through this catchment would be approximately 1.5 m^3/s during 1 in 100-year storm event.

Subcatchment #7

This catchment is approximately 16.63 ha, with a general high elevation determined from Lidar of 783.0m, and a low spot of 776.8m. The catchment is about 10% impervious (runway), and 90% pervious (grasslands). Runoff from this catchment is collected within a central ditch, which drains from the southeast to the northwest towards existing 900mm dia. culvert at a grade of 0.6% over 1050m, which eventually drains in to subcatchment #8. A portion of ditch does have grade less than 0.5% and it is recommended that the drainage ditch should be re-graded to have a drainage grade of greater than or equal to 0.5% to allow adequate flow to the low area of the catchment. General grading of the catchment towards the drainage ditch ranges from 0.5 – 2.6%.

As mentioned in Airport Master Plan, no future development is anticipated for this catchment as it is to remain in existing condition. Total expected peak flow through this catchment would be approximately 1.6 m^3/s during 1 in 100-year storm event.

Subcatchment #8

This catchment is approximately 5.53 ha, with a general high elevation determined from Lidar of 782.3m, and a low spot of 773.6m. The catchment is about 10% impervious (runway), and 90% pervious (grasslands). Runoff from this catchment is collected within a central ditch, which drains from the southeast to the northwest at a grade of 1.8% over 400m. A portion of ditch does have grade less than 0.5%, which is a concern for pooling in the area and it is recommended that the drainage ditch should be re-graded to ensure positive drainage towards the low area of the catchment. General grading of the catchment towards the drainage ditch ranges from 1.5 – 17.0%.

As mentioned in Airport Master Plan, no future development is anticipated for this catchment as it is to remain in existing condition. Total expected peak flow through this catchment would be approximately 2.2 m^3/s during 1 in 100-year storm event.

Subcatchment #9

This catchment has an approximate area of 3.43 ha, with a general high elevation determined from Lidar of 780.9m, and a low spot of 773.2m. This catchment is 100% pervious (grasslands) area. Runoff from this catchment drains from southeast to the northwest, which eventually drains into low area at the north end of the catchment and follows off-site drainage path to the north. General grading of the catchment towards the drainage ditch ranges from 0.1 – 5.4%.

As mentioned in Airport Master Plan, no future development is anticipated for these catchments as it is to remain in existing condition. Total expected peak flow through this catchment would be approximately 0.3 m^3/s during the 1 in 100-year storm event.

Subcatchment #10

This catchment has an approximate area of 11.58 ha, with a general high elevation determined from Lidar of 780.2m, and a low spot of 766.0m. This catchment is 100% pervious (grasslands) area. Runoff from this catchment drains from south to the north, which eventually drains into low area at the north end of the catchment and follows off-site drainage path to the north. General grading of the catchment towards the drainage ditch ranges from 0.6 – 2.9%.

As mentioned in the Pasquini SWM Report and Airport Master Plan, the only developed area will be in northwest corner of this catchment, which will have a major stormwater management facility to store upstream flow from catchment 16, prior to discharging the flow off-site. Furthermore, no future development is anticipated for this catchment as it is to remain in existing condition. Total expected peak flow through this catchment would be approximately 3.1 m^3/s with this catchment expecting to generate 13,000 m^3 of runoff (including upstream catchment 16) during the 24-hour, 1 in 100-year storm event.

Note: Subcatchment # 16 is proposed developed area.

5.2.2 DEVELOPED / DEVELOPING SUBCATCHMENTS

Subcatchment areas that are understood to be developed in the future are generally located west and southwest of the runway. As mentioned in the Pasquini SWM Report, proposed drainage to remain as close as possible to existing pattern with proposed stormwater management facilities as shown on Figure ST-1 in that report.

Subcatchment #11

This catchment comprises an existing tenant facility for operations by the Alberta Forestry Tanker Base with an approximate area of 7.06 ha, with a general high elevation determined from Lidar of 782.6m, and a low spot of 769.9m. The catchment is about 15% impervious (site and taxiway), and 85% pervious (grasslands). A portion of runoff from this catchment is directed into a collection pond located adjacent to the airport taxiway. Runoff from the collection pond is discharged through culvert into the ditch at grade of 1.2% into subcatchment #1 on the east side. General grading of the catchment ranges from 0.04 – 1.5%. It is recommended that northwest corner be re-graded to ensure positive drainage towards the northeast corner. Drainage from the existing access roadway along the southwest boundary on the catchment is flowing into the roadside ditch, which drains downstream towards south of the airport boundary.

As mentioned in the Pasquini SWM Report, the facility within this catchment is only operational during the spring, summer and fall and it is unlikely that any de-icing would take place. If any de-icing of the aircraft were to take place adjacent to apron, the chemicals associated with the operation may end up in the catchment and future development should consider a designated location for de-icing with appropriate collection point for chemical runoffs. The use of control gates, sumps and pump out locations can allow operators to close off stormwater flow, if necessary, and capture contaminants locally for proper handling or treatment.

As mentioned in the Pasquini SWM Report, since the discharge from this catchment will increase the runoff in the subcatchment #1, there may be an opportunity to develop future stormwater management facility in subcatchment #1 to control and treat additional discharge prior to release off-site of the airport boundary.

As mentioned in Airport Master Plan, future development is anticipated for this catchment with approximately 70% impervious (airside commercial) area. Total expected peak flow through this catchment would be approximately 1.4 m^3/s, during the 1 in 100-year storm event.

Subcatchment #12

This catchment comprises a Woodlands County Operational Reserve with an approximate area of 2.35 ha, with a general high elevation determined from Lidar of 778.7m, and a low spot of 774.7m. The catchment is about 15% impervious (tenant site), and 85% pervious (grasslands). Runoff from this catchment is collected into the ditch at grade of 2.2% over 200m, located on the east side of the catchment, which drains north into subcatchment #1.

General grading of the catchment ranges from 0.2 – 1.9%. Drainage from the existing access roadway along the southwest boundary on the catchment is flowing into the roadside ditch, which drains downstream towards south of the airport boundary.

As mentioned in the Pasquini SWM Report, since the discharge from this catchment will increase the runoff in the subcatchment #1, there may be an opportunity to develop a future stormwater management facility in subcatchment #1 to control and treat additional discharge prior to release off-site.

As mentioned in Airport Master Plan, the future development anticipated for this catchment is Operational Reserve, which has been estimated to have 50% impervious area. Total expected peak flow through this catchment would be approximately 0.4 m^3/s, during the 1 in 100-year storm event.

Subcatchment #13

This catchment has an approximate area of 6.72 ha, with a general high elevation determined from Lidar of 776.7m, and a low spot of 771.4m. This catchment is 100% pervious (woodland) area. Runoff from this catchment is directed into northeast, which drains north into subcatchment #1. General grading of the catchment ranges from 0.3 – 2.2%. Drainage from the existing access roadway along the southwest boundary on the catchment is flowing into the roadside ditch, which drains downstream towards the southside of the airport boundary.

As mentioned in the Pasquini SWM Report, since the discharge from this catchment will increase the runoff into the subcatchment #1, there may be an opportunity to develop a future stormwater management facility in subcatchment #1 to control and treat additional discharge prior to release off-site. Stormwater facility can also be sized to service off-site drainage from subcatchments #11 and #12.

Furthermore, the future development is anticipated as Highway Commercial for this catchment, which is estimated to have 80% impervious area. Total expected peak flow runoff through this catchment would be approximately 1.4 m^3/s, during the 1 in 100-year storm event.

Subcatchment #14

This catchment comprises airport terminal, tenant facilities, airside commercial and other operational facilities with approximately 47.41ha. The catchment is about 35% impervious (tenant site) and 65% pervious (grasslands). Runoff from this catchment is directed in a south direction. The existing major storm system placed in this catchment has ditches and culverts, where the currently developed northeast portion of the catchment drains into the existing

roadside ditch, which currently flows to downstream subcatchments # 11, 12 and 13, which eventually flows off-site. The southwest portion of the catchment consists of a small woodland area, where the runoff is directed towards the south portion of the catchment, which will drain into off-site existing drainage flow path. This catchment has multiple small areas in the catchment where drainage slopes are below standards and no flow is being directed, which causes pooling in the areas. It is recommended that those areas be re-graded to ensure positive drainage towards the southern edge, since the areas are relatively flat. Drainage from the existing access roadway along the southwest boundary on the catchment is flowing into the roadside ditch, which drains downstream towards the southside of the airport boundary.

As mentioned in the Pasquini SWM Report, since the size of this catchment is quite large, a stormwater management facility should be developed on south side of this catchment to collect and control all runoff prior to discharging off-site or conveyed by a minor stormwater system into the downstream subcatchment #1. Furthermore, future development is anticipated for this catchment with approximately 90% impervious (terminal service, airside commercial and light industrial) area. Total expected peak flow runoff through this catchment would be approximately 10.8 m^3/s, with this catchment expecting to generate 43,000 m^3 of runoff during the 24-hour, 1 in 100-year storm event.

Subcatchment #15

This catchment is approximately 30.35 ha, with a general high elevation determined from Lidar of 781.7m, and a low spot of 777.8m. This catchment is 100% pervious (woodland) area. Runoff from this catchment is directed into south/southwest direction towards low point, which drains off-site of airport boundary. Since this catchment consists of a large woodland area, it is difficult to determine the exact drainage path of the catchment. Drainage from the existing access roadway along the west boundary of the catchment is flowing into the roadside ditch, which drains southward.

As mentioned in the Pasquini SWM Report, the discharge from this catchment should be directed towards the south of the catchment into a stormwater facility prior to off-site discharge into road right-of-way. The Stormwater Management facility is proposed for the south end of the subcatchment adjacent to the airport boundary.

As mentioned in Airport Master Plan, future development is anticipated for this catchment with approximately 70% impervious (airside commercial and light industrial) area. Total expected peak flow runoff through this catchment would be approximately 5.9 m^3/s, with this catchment expecting to generate 25,000 m^3 of runoff during the 24-hour, 1 in 100-year storm event.

Subcatchment #16

This catchment is approximately 9.97 ha, with a general high elevation determined from Lidar of 781.7m, and a low spot of 779.7m. This catchment is 100% pervious (woodland) area. Runoff from this catchment is directed north towards low point, which drains into subcatchment #10. General grading of the catchment ranges from 0.2 – 2.1%. Since this catchment consists of a large woodland area, it is difficult to determine the exact drainage path of the catchment. Drainage from the existing access roadway along the west boundary on the catchment is flowing into the roadside ditch.

As mentioned in the Pasquini SWM Report, since the discharge from this catchment will increase the runoff in the subcatchment #10, there may be an opportunity to develop future stormwater management facility in subcatchment #10 to control discharge prior to release off-site of the airport boundary.

As mentioned in Airport Master Plan, future development is anticipated for this catchment with approximately 80% impervious (airside commercial) area. Total expected peak flow of this catchment would be approximately 2.1 m^3/s, during the 1 in 100-year storm event.

5.3 CONCLUSION AND GENERAL RECOMMENDATIONS

WSP is in agreement with the findings and stormwater management plan prepared by Pasquini and Associates. The plan was found to be viable and no major changes are required. No new drainage routes have been proposed and natural drainage paths into the Athabasca River and the industrial area south of the airport will be maintained. The following sections provide general recommendations to support future development at the airport from a drainage and stormwater management perspective.

5.3.1 LOT & DITCH GRADING

After analysing all the catchments, it is recommended that all the undeveloped catchments, which are to remain undeveloped, are re-graded in parts of the catchments where grade slopes are less than 0.1% and ditches less than 0.5% to ensure a positive and adequate drainage through the property.

Developed lots should have site grading of 1-2% minimum, with minimum ditch slopes of 0.5% (1% where possible).

As well, it is recommended that Woodlands County cleans and widens out existing ditches throughout the current airport development area to ensure adequate drainage, as well as to ease the challenge of maintaining the ditches.

5.3.2 CULVERTS

With major flows being conveyed in the proposed ditches, it is recommended that culverts are sized to handle the 1:100-year peak flows, otherwise roads and entrances are at risk of being washed out during larger storm events. Detailed modelling of the expected flow paths and runoff, as well as a good understanding of the ditch storage capacities, can be undertaken during detailed design to accurately size the culverts.

5.3.3 STORMWATER MANAGEMENT FACILITIES

It is recommended that for any future developments, a stormwater management facility should be put in place to control all the storm drainage on-site prior to discharging off-site to its natural drainage path. As mentioned in Figure ST-1 in the Pasquini SWM Report (Figure 5.1), catchments #1, 10, 14 and 15 have upstream contribution of the storm runoff, which generates approximately 33,000 m^3, 13,000 m^3, 43,000 m^3 and 25,000 m^3, respectively.

These developing catchments should incorporate on-site stormwater storage where practical to temporarily detain runoff from upstream catchments prior to off-site release; this could reduce the road culvert sizes downstream, as well as reduce the size of the larger stormwater management facilities. To obtain appropriate sizing of stormwater facilities (i.e. storage pond), detailed modelling of the developed catchments and their allowable release rates is required for critical storm events.

5.3.4 WILDLIFE / WATER BODIES

The stormwater management facilities may contain permanent water bodies, which will attract wildlife and other species. Considering proximity to the air traffic, measures for wildlife and bird control should be explored during detailed design. Some techniques that are recommended to reduce wildlife attraction are:

- Dry Ponds for Runoff Storage (no permanent water body);
- Effective ditching and lot grading (reduce standing water);
- Rip-Rap and Steep Slopes on Wet ponds (Reduce wildlife habitats); and
- Physical Deterrents, i.e. noise makers or wires (prevents birds from landing).

5.3.5 CONTAMINANTS

As mentioned above in Catchment #11, it is recommended that during detailed design techniques are explored to reduce the risk of de-icing contaminants entering the downstream

water bodies. The use of gates, sumps, and pump out locations can be implemented where necessary to help capture contaminated runoff.

5.3.6 ORDER OF MAGNITUDE ESTIMATIONS

The development of the airport property will require various stormwater infrastructure. Moving forward, expected drainage costs and allowances associated with this development could be as follows:

- 4x Stormwater Management Facilities w/ Control Manholes $4,500,000
- New roadway and entrance culverts, and some storm piping $1,000,000
- Allowance for existing lot / ditch drainage improvements $100,000
- Allowance for Treatment and containment of Contaminated Runoff $1,000,000

5.4 NEXT STEPS

Recommended next steps include the following.

Table 5.1: Stormwater Management Next Steps

STORMWATER MANAGEMENT	NEXT STEPS
Short Term (1 to 5 Years)	➢ Clean and widen existing ditches. ➢ Identify areas for future stormwater storage and protect for this use.
Medium Term (6 to 10 Years)	➢ Develop stormwater management facilities in those areas slated for future commercial development, including provision for stormwater storage. ➢ Regrade areas identified for future development to allow for positive drainage slopes.
Long Term (11+ Years)	➢ Develop stormwater management facilities in those areas slated for future commercial development, including provision for stormwater storage.

6 ROTARY VS FIXED WING CONFLICTS

6.1 INTRODUCTION

Whitecourt Airport houses multiple aviation businesses and accommodates both fixed and rotary-wing aircraft operations. The two types of aircraft have varying manoeuvring and infrastructure requirements, which can lead to potential conflicts on the airfield. This section reviews the interface between fixed and rotary-wing aircraft and operations at Whitecourt Airport and proposes resolutions.

6.2 SUMMARY OF CONSULTATIONS

Consultations with Whitecourt Airport stakeholders addressed the existing conditions at the airport and provided an operator's perspective related to conflicts between fixed and rotary-wing operations.

Whitecourt Airport consists mostly of rotary-wing operators, including a rotary-wing flight training business, using private or leased land within the airport boundary for aircraft departures and arrivals. Generally, rotary-wing operators see themselves as operating a private heliport on their land or leasehold within the airport site.

Conflicts between fixed and rotary-wing operations have been reported by users and airport management as most prevalent in the central airside area, between Aprons I and III, illustrated in Figure 6.1 below. A lack of pilot etiquette and airmanship was cited by some stakeholders as the main source of heightened tensions between the fixed and rotary-wing operators. Accounts were provided of hazardous behaviour such as overflying airport buildings and other aircraft at low altitudes. Certain stakeholders provided photographs and video recordings showing evidence of hazardous behaviour on the airfield.

Through stakeholder consultations, it was determined the airport configuration presents sightline issues for the NAV Canada Flight Service Station. Specifically, they are challenged in observing activity between Aprons I and III where the conflicts have been reported to predominantly occur.

No data or incident documentation was provided for any fixed and rotary-wing during the consultations. A search for Civil Aviation Daily Occurrence Reporting System (CADORS) entries over the past five years at Whitecourt Airport for incidents involving helicopters returned eight reports that included conflicts with vehicles (maintenance, unmarked and golf carts); fixed-wing aircraft or proximity to buildings. There were no such reported incidents in 2019 or 2020. There were two 2015 incidents where a helicopter was operating with an

external load or sling load attached; the first incident saw the helicopter operating over private property, structures, fixed-wing aircraft and people, and the other saw parts of the load drop on short final. Some stakeholders indicated the fixed and rotary-wing conflict was a historical issue and the situation has improved, while others believe it is still ongoing. The CADORS presented some evidence of conflict but did not decisively present a pattern of ongoing conflict between fixed-wing and rotary-wing aircraft. It is important to note that the CADORS only capture incidents when reported by NAV Canada or the public.

In summary, while some consultation presented concern of a conflict, no evidence of an ongoing pattern of conflict between fixed-wing and rotary-wing was identified within the limited scope of the review. The consultation revealed a lack of airmanship was believed the main reported conflict between fixed and rotary-wing operators.

Figure 6.1: Map of Primary Fixed- and Rotary-Wing Aircraft Conflict Area

6.3 POTENTIAL CAUSES

Multiple potential causes were identified that may contribute to conflicts between fixed and rotary-wing operations, including:

- Lack of airmanship;
- Separation between land uses;

- Communication;
- Local procedures and enforcements; and
- Excessive airborne Foreign Object Debris (FOD).

A lack of airmanship and pilot etiquette involves unprofessional conduct between parties sharing the airfield for operations. At times, these behaviours may become hazardous to the airport and its users. Personalities and previous conflicts between tenants may play a role in how some operators choose to co-exist at the airport and operate their aircraft. Personalities and pre-existing conflicts were presented during the consultations. While lack of airmanship was the primarily reported issue by stakeholders during the consultation, there are multiple potentially underlying causes that may lead to these behaviours.

The clustering of operators in a relatively congested space, particularly between Aprons I and III, may be one of the potential underlying causes to the conflicts. The current configuration may create challenges for aircraft to comfortably maneuver without disturbing adjacent operators. Confined spaces on the airfield may exacerbate the negative impacts of rotor or propeller downwash and aircraft noise on surrounding operators. The issue of downwash may be further compounded with the presence of unpaved or gravel road and apron areas between Aprons I and III, where frequent fixed-wing and rotary-wing traffic is present.

Insufficient communication between and among airport operators and airport staff may inhibit the development of solutions to the above issues. If a forum for discussing conflicts, communicating rules, providing updates and receiving tenant feedback is unavailable or returns inconsistent responses, airport operators will be unlikely to participate and airport matters involving multiple parties may take longer to resolve. If measures for communicating changes and updates are inadequate or inappropriate for airport operators, they may not be aware of changes or respond to them in a timely and suitable manner.

Insufficient local procedures may lead to disorganized operations and confusion on the airfield, as operators may not respond suitably to various events or may respond in inconsistent ways. Such actions may lead to hazardous behaviours if there are no procedures to fall back on to ensure consistency in airfield operator responses. Insufficient implementation of procedures may lead to further confusion on the airfield, as operators may not have consistent messaging regarding what actions are permitted and those that are not. Any hazardous behaviour should be addressed appropriately as it poses a risk to aviation safety.

Airborne debris was also frequently mentioned during the stakeholder consultations as a prevalent concern. Such debris, referred to as Foreign Object Debris (FOD) by airports, may be soil, rocks, gravel, aircraft components or miscellaneous items that may be found on the

airfield where aircraft are moving. As aircraft move about the airfield, FOD may become airborne through propeller wash or rotor downwash and damage the moving aircraft body or be ingested in the engines. FOD kicked up by downwash is equally dangerous to surrounding parties as it may damage nearby aircraft or property and may seriously injure people. FOD may become a serious issue at airports that have unpaved or gravel aircraft movement surfaces. The dangers of FOD may be intensified by tight spacing between airport operators, especially when they share unpaved movement areas, and potentially presents an additional point of tension and conflict between operators as they attempt to keep their aircraft clean and undamaged.

All of the above causes may work independently or together to lead to conflicts between users of the airfield. It is difficult to properly track and analyze trends in conflicts without a dedicated data collection system, which would provide the necessary level of detail to inform responses to conflicts between operators at Whitecourt Airport.

A summary of conflicts and potential underlying causes is illustrated in Figure 6.2.

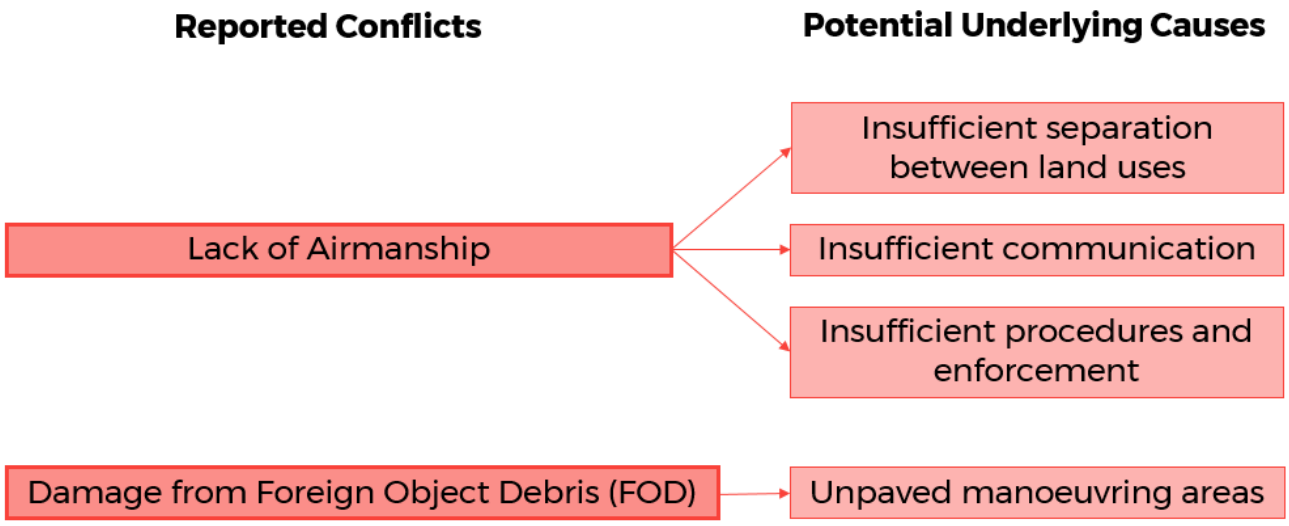


Figure 6.2: Fixed- and Rotary-Wing Mixed Operations Conflicts and Potential Underlying Causes

6.4 RECOMMENDATIONS FOR RESOLUTION OF CONFLICTS

Five (5) operational and five (5) capital recommendations have been identified to potentially resolve the conflicts described above. The solutions could be applied individually or in

concert with each other for greater effectiveness. A summary of operational and capital recommendations is illustrated in Figure 6.3. The recommendations below have been listed in order of increasing effort and cost; the airport may choose to implement them in the order they appear and work down the list if additional measures are needed to resolve the conflicts.

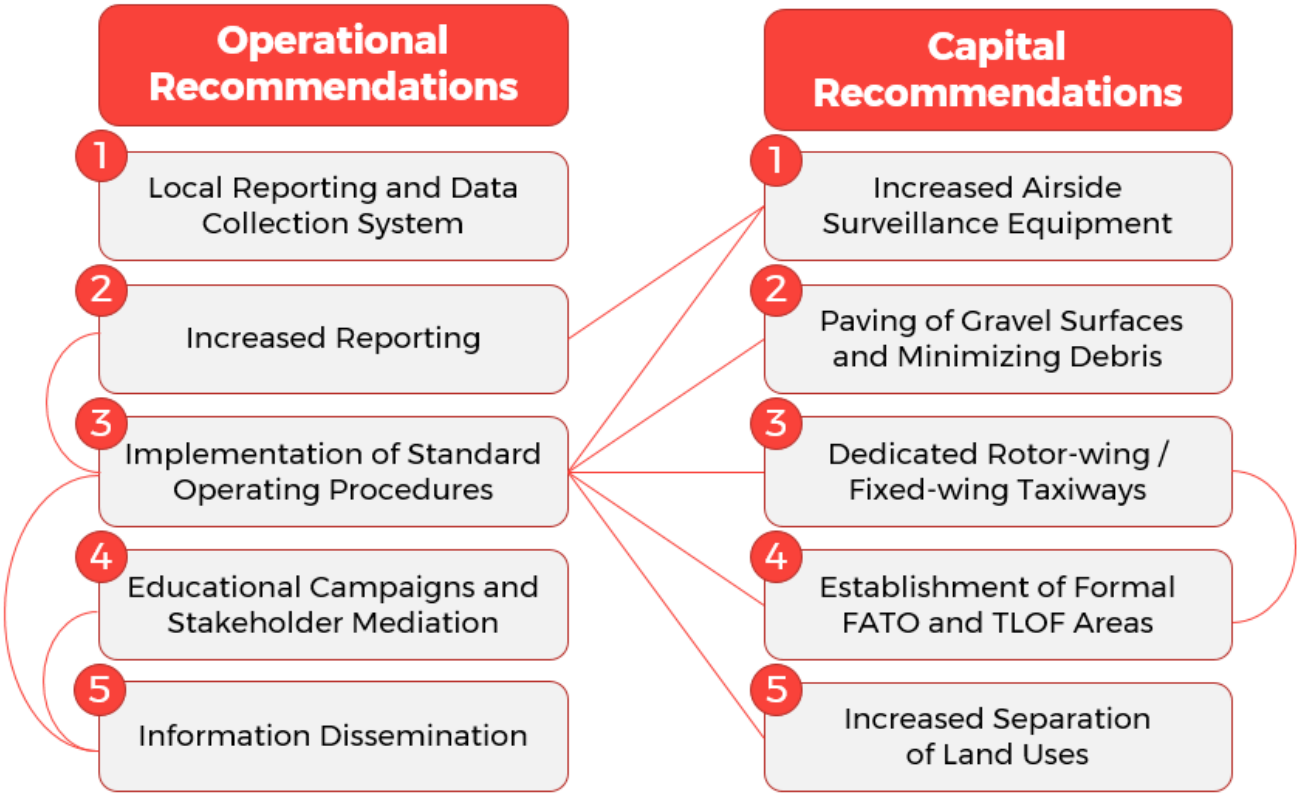


Figure 6.3: Summary of Recommendations for Conflict Resolution

6.4.1 OPERATIONAL RECOMMENDATIONS

6.4.1.1 *LOCAL REPORTING AND DATA COLLECTION SYSTEM*

The establishment of a system for reporting local aviation incidents at Whitecourt Airport and the surrounding airspace, similar to CADORS, would create a tool to record events for future analysis and decision-making and to support the Safety Management System currently in place at the airport. Airport staff would create procedures for recording, storing and analyzing data related to incidents and conflicts on the airfield, which would be followed any time a new event is reported by airport operators or observed by airport staff or parties such as NAV Canada. All airport staff and tenants would be encouraged to report the underlying causes of

the reported occurrences. Conflict patterns may be more readily identified and actioned if a body of data and evidence is available for detailed analysis. This would provide critical data for required safety improvement and supplement the CADORS, which currently do not align with the levels of conflict reported by some airport tenants.

6.4.1.2 *INCREASED REPORTING*

Airport tenants and personnel should be encouraged to continue reporting hazardous operation of aircraft and the breaking of aviation rules to airport management and Transport Canada as this behaviour affects overall airport safety. If increased airside surveillance equipment is installed, as described in Capital Recommendation 1, the necessary footage will be available to support reports to Transport Canada through the Civil Aviation Daily Occurrence Reporting System (CADORS) while also supporting airport safety improvement and education. These actions would facilitate the establishment of a safety reporting culture that encourages safe behaviour and addresses hazardous activities, as appropriate. Transport Canada possesses the resources and authority to enforce safe aircraft operation regulations and based on the severity or frequency of reports may choose to pursue disciplinary action against a subject of CADORS reports, even up to the suspension or cancellation of Canadian Aviation Documents such as licenses.

6.4.1.3 *IMPLEMENTATION OF STANDARD OPERATING PROCEDURES*

The establishment, implementation, communication and enforcement of Standard Operating Procedures (SOP), particularly for rotary-wing aircraft, may resolve existing conflicts on the airfield. The procedures may be designed in concert with the capital recommendations below or on their own; the objective is to establish a better degree of control and predictability over rotary-wing flights on airport property. The SOP may include measures for traffic management; overflying construction sites, other aircraft and airport buildings; reporting safety concerns and rule-breaking; and training operations would be developed and implemented. The SOPs development can be lead by the airport and developed in collaboration with the stakeholders. The documents would be disseminated to airport operators by electronic mail; other information dissemination options explored in Operational Recommendation 5 may also be considered. The airport would also be responsible for enforcing the SOPs, by reporting dangerous behaviour to Transport Canada and other discipline measures deemed appropriate. Examples of discipline measures that may be used by Whitecourt Airport management may include infractions under Whitecourt Airport Manual of Airport Traffic Directives or a progressive discipline enforcement program.

The Whitecourt Airport may also consider establishing arrival and departure procedures for helicopters, for example defining specific flight paths to be used in various stages of arrival or

departure, though such an undertaking would be resource and time-intensive to develop and difficult to enforce. A defined training area, potentially west of the Whitecourt Airport, may also be considered to keep rotary-wing aircraft from the flight training unit who need to practice flying at low altitudes and various maneuvers from the airport grounds when it is not necessary. This area would keep those rotary-wing flight training aircraft close to the airport but away from other air and ground traffic that may need to access the airport facilities and grounds. This training area would be developed in consultation with all relevant stakeholders.

The Airport Operations Manual (AOM) would need to be updated with any implemented SOP to provide a record of how the airport manages and controls rotary-wing aircraft traffic.

6.4.1.4 *EDUCATIONAL CAMPAIGNS AND STAKEHOLDER MEDIATION*

Educational campaigns by Woodlands County – Whitecourt Airport staff, possibly with NAV Canada's assistance, may help resolve conflicts due to unfamiliarity with operating safely in an airport environment, while mediation exercises may help resolve conflicts between individual operators. These sessions may be organized as part of a series to engage and consult with stakeholders as the Whitecourt Airport implements new procedures designed to address conflicts between fixed-wing and rotary-wing operators. An educational campaign would consist of a series of seminar-style meetings to communicate the new procedures, as well as the CARs regarding operating in an airport environment. The onus would be on aircraft operators to attend the seminars and to be educated about the airport procedures and regulations applying to operating in an airport environment.

A stakeholder mediation campaign would consist of a set of meetings where fixed- and rotary-wing stakeholders discuss current challenges and conflicts experienced on the airfield, resolve conflicts with the help of a third-party mediator, and build relationships with each other. The mediation exercise would be a forum for constructive discussion for local operators to address historical conflicts and tensions while working towards a common understanding in the interest of safety. The results of the mediation exercises would be a plan that lists the issues that were addressed, documents stakeholder comments and concerns, and outlines steps that were identified for conflict resolution, which would then be recorded in the SOP, AOM and any other applicable documents.

6.4.1.5 *INFORMATION DISSEMINATION*

Increased and enhanced information dissemination methods may be considered, potentially alongside Operational Recommendations 2 and 4, to ensure that procedures, alerts and other information of interest is conveyed to all affected parties. Up-to-date bulletin boards may be considered in high traffic areas, such as the terminal building. However, electronic dissemination to tenants with follow-up by airport staff may be the more effective option due

to its flexibility. The airport webpage may be updated regularly with a news feed; SOP and other procedures may also be located online in a password protected area such as a tenant portal. Emails with notices, alerts and news may be sent to key stakeholders including chief pilots, owners and individual airport tenants regularly for dissemination to associated personnel as applicable.

6.4.2 CAPITAL RECOMMENDATIONS

6.4.2.1 INCREASED AIRSIDE SURVEILLANCE EQUIPMENT

The installation of airside surveillance equipment, such as cameras, may support parties such as NAV Canada in improving monitor conflicts and deter hazardous behavior in real time with the capability of retaining video records for educational purposes. As described in Operational Recommendation 2, NAV Canada may be better equipped to report hazardous behaviour if a camera feed provided a line of sight into the area where conflicts most frequently occur, which is currently shielded from the flight service station by the large hangar near Apron I. With these measures, NAV Canada may be able to take a stronger role in reporting hazardous behaviour. Additional discussions with NAV Canada regarding surveillance technology opportunities is recommended.

6.4.2.2 PAVING OF GRAVEL SURFACES AND MINIMIZING DEBRIS INCREASED

The principal underlying cause of damage to aircraft from debris is the presence of unpaved areas in high-traffic areas, particularly between Aprons I and III. In unpaved areas, loose dirt, gravel and other debris may be kicked up by propeller wash and rotor downwash, which presents a safety risk to people and property. By paving frequently-used gravel areas between Aprons I and III, the amount of airborne debris would likely be reduced. In place of paving, grass may be planted to hold together loose dirt on the ground. Alongside these measures, airport management can continue to encourage airport tenants to maintain clean, tidy and debris-free lease lots under the existing Foreign Object Damage (FOD) Control Procedures to minimize potential airborne hazards in the airside area.

6.4.2.3 DEDICATED ROTARY-WING / FIXED-WING TAXIWAYS

Separating taxiing traffic may reduce the amount of conflict between fixed- and rotary-wing aircraft. Separation may be achieved by implementing dedicated and properly delineated rotary-wing and fixed-wing taxiways on the airfield to establish traffic flow, ease congestion and minimize conflict near airside buildings. For example, a rotary-wing taxiway between the current location of Pipistrel and the three private general aviation hangars may provide a simple and well-defined route for rotary-wing aircraft to navigate to and from their respective airfield hangars and buildings. These taxiways would ideally be paved so as to not create

additional airborne debris, or FOD. The rotary-wing taxiways would be defined as such in operational manuals such as the AOM or SOPs and publications such as the Canada Flight Supplement (CFS). Signage and markings would not differ from that for a conventional taxiway. Education and training for airport staff and tenants such as that in Operational Recommendation 4 will help each party easily identify where each type of aircraft traffic is permitted to operate.

6.4.2.4 *ESTABLISHMENT OF FORMAL FATO AND TLOF AREAS*

At present, most rotary-wing aircraft arrive and depart from private apron areas without formal established procedures. In combination with the creation of procedures described in Operational Recommendation 3, CARs 325-compliant Touch-down and Lift-off (TLOF) and Final Approach and Take-off (FATO) areas may either be established individually for each rotary-wing operator or communally for all operators to use. A FATO may provide access to multiple TLOFs for simultaneous operations and would ideally be located away from fixed-wing operations. With all rotary-wing aircraft traffic landing at and departing from a well-defined area, greater control and predictability is established over their movements. If the infrastructure were to be used at night, appropriate lighting per CARs Standard 325 would be required. Over the long term, FATOs may be connected by rotary-wing taxiways; however, fixed- and rotary-wing operations would need additional separation in the future to prevent conflicts. With proper review, a single FATO for all smaller rotary-wing aircraft flights may be established in the northwest corner of Apron I, which would be a more cost-effective solution than preparing FATOs and TLOFs for each operator. To prevent potential damage to aircraft in the congested area between Aprons I and III, a restriction based on rotary-wing aircraft size could limit larger aircraft over a certain threshold from using the FATO, which would then land on the runway and air taxi to Apron I. These larger rotary-wing aircraft would be towed in and out of the congested area between Aprons I and III. Smaller rotary-wing aircraft could land on the communal FATO and air taxi to their destination as demonstrated in Figure 5.4. In the event that fuelling services return to Whitecourt Airport, the FATO may be shifted to a different area on the Apron, such as the southeast corner, and taxi to the rotary-wing area using the adjoining taxiway system. Such processes would need to be documented and disseminated by Whitecourt Airport management in concert with Operational Recommendations 3 and 5.

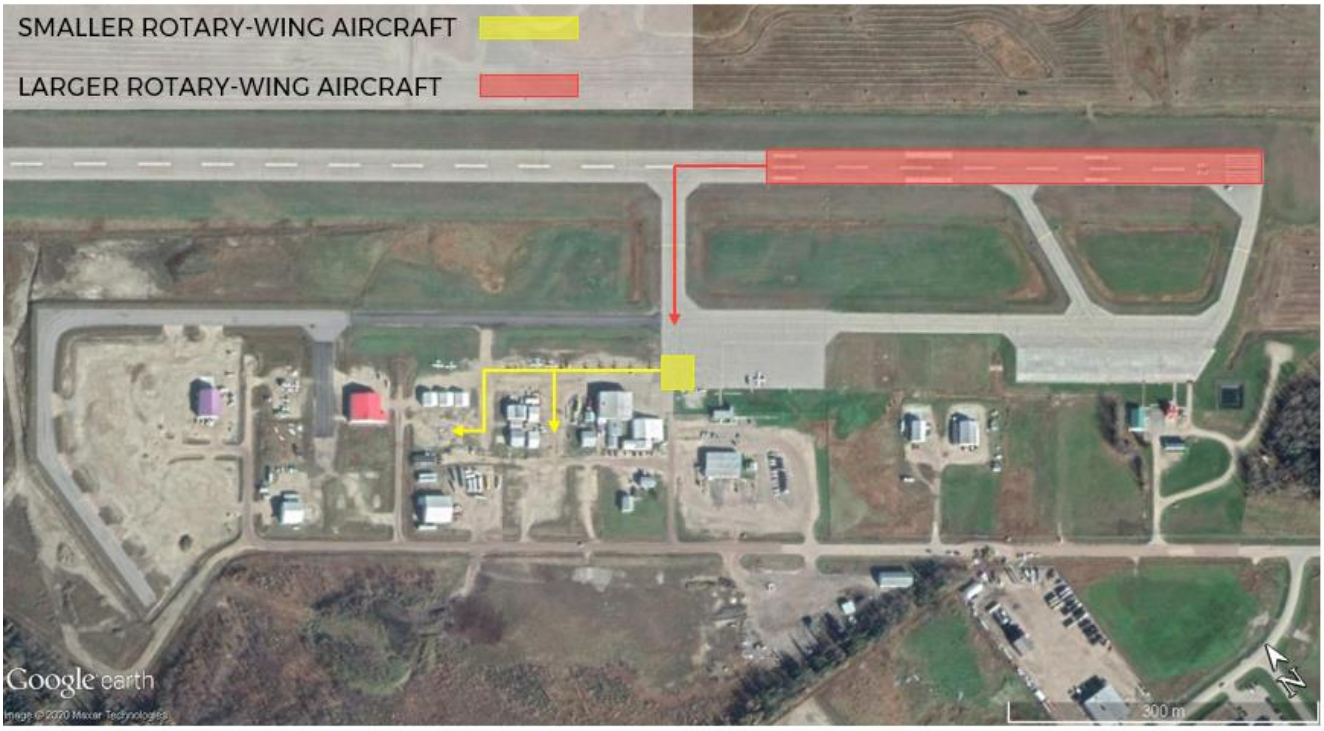


Figure 6.4: Potential Traffic Paths for Smaller vs. Larger Rotary-Wing Aircraft

6.4.2.5 *INCREASED SEPARATION OF LAND USES*

Achieving greater separation between fixed- and rotary-wing operators through relocation of airport tenants would likely be the most effective solution for reducing or eliminating conflict between the two parties, though also the most expensive one. Allowing greater distance between the two types of operations may prevent conflicts as there would be more space for aircraft to maneuver without impacting nearby tenants and their aircraft. For example, fixed-wing operators may be relocated toward the west end of the airside area, while rotary-wing operators may be kept to the east, which generally follows the existing layout of the airfield. Alongside tenant relocation, refinement of the Airport Development Plan should be pursued such that property or lease lot lines are properly delineated and future areas for development are clearly identified to avoid further conflict. Typically, these undertakings are conducted with the help of an aviation consultancy as they bring knowledge and experience from other airports that faced similar challenges. An airport survey may be required, which could then be used as a valuable resource for subsequent or different analyses.

6.5 CONCLUSION

A large component of resolving the fixed- and rotary-wing conflicts discussed in this section lies in pilot professionalism and airmanship, as well as operating with courtesy and common

sense on the airfield. However, five (5) operational and five (5) capital strategies, as illustrated in Figure 6.3, have been suggested to facilitate the resolution of these challenges. The recommendations have been ordered in terms of increasing cost and effort; Whitecourt Airport may choose to implement these recommendations in the order as they appear and rely on stronger measures if needed. For example, if conflicts continue despite increased data collection and reporting, further measures such as standard operating procedures (SOPs), educational campaigns and increased information dissemination may be warranted. Similarly, if increased surveillance, to support reporting, and the paving of gravel movement areas are insufficient, more expensive and time-consuming measures such as separate infrastructure systems or tenant relocation may be warranted. The strategies, as illustrated in Figure 6.3, may be implemented together for increased effectiveness, such as establishing increased airside surveillance to support reporting and procedure creation efforts.

The CARs emphasize that the safe operation of aircraft is essential; as such, reporting to Transport Canada incidents that affect safety at the airport is highly encouraged through the CADORS system. Transport Canada may be the best equipped to pursue disciplinary actions against operators who trend as the subject of submitted CADORS.

6.6 NEXT STEPS

The following are recommended next step in resolving potential rotary-wing / fixed-wing conflicts.

Table 6.1: Rotary Versus Fixed Wing Conflict Resolution Next Steps

ROTARY VS FIXED WING CONFLICT RESOLUTION	NEXT STEPS
Short Term (1 to 5 Years)	➢ Implement a system for reporting local aviation incidents at Whitecourt Airport and the surrounding airspace, similar to CADORS. ➢ Encourage reporting hazardous operation of aircraft and the breaking of aviation rules to airport management and Transport Canada. ➢ Establish and enforce Standard Operating Procedures (SOP), particularly for rotary-wing aircraft, including arrival and departure procedures for rotary-wing aircraft. ➢ Hold educational sessions with airport operators and disseminate information to various parties.
Medium Term (6 to 10 Years)	➢ Install CCTV equipment to enable NAV Canada to see blind spots. ➢ Pave gravel maneuvering areas to minimize potential for FOD damage. ➢ Establish defined FATO and TLOFT areas and hover taxi routes for rotary-wing aircraft.
Long Term (11+ Years)	➢ Spatially separate rotary-wing wing operations from fixed wing operations, including relocation of existing tenants.

7 OWNERSHIP OPTIONS

7.1 INTRODUCTION

To assess future ownership options for Whitecourt Airport, the current ownership and alternative ownership models are presented, providing a description of their methods as well as their financial implications, degree of municipal control, opportunities and challenges. To provide context, a Canadian case study is outlined for each option as applicable. A comparison of these ownership models, in addition to an analysis of the future vision of Whitecourt Airport and the surrounding lands, is used to develop appropriate recommendations.

7.2 BACKGROUND INFORMATION

Whitecourt Airport has experienced two ownership scenarios over its 43-year history. The airport land was first sold to the province of Alberta for $1.00 in the 1970s and the facility was constructed for $2.6 million. The province of Alberta was the owner and operator of Whitecourt Airport from 1977 until 1995.

In 1994, the National Airports Policy was introduced, outlining the divestiture of most federally owned Canadian airports. This policy was implemented primarily to divest the federal government from any financial obligation to fund the expansion of airports in Canada, but did give municipalities the opportunity and control to utilize their airports for economic development. The province of Alberta followed suit and divested itself from its airport assets. In accordance with this decision, ownership and operations of Whitecourt Airport were transferred to Woodlands County in 1995. The County continues to own and operate the airport.

7.3 CURRENT OWNERSHIP MODEL

Woodlands County is the present owner and operator of Whitecourt Airport. Woodlands County Council has ultimate authority over the Whitecourt Airport. The County Administration prepares the airport budget for Council approval. While the budget is primarily allocated from County revenue, the Town of Whitecourt contributes a minor amount to the airport annually.

Some decision making related to the planning, development and marketing of the airport is informed by the Airport Advisory Committee (AAC). The AAC is composed of nine members; three Woodlands County councillors, three Whitecourt councillors, one Whitecourt Airport Fixed Wing representative, one Rotary Wings Group representative and one representative

from Alberta Environment and Sustainable Resources Development (ESRD). From consultations, airport stakeholders generally identified that the AAC has limited influence over the airport and that engagement from the group is sporadic.

Day-to-day operations of the airport is the responsibility of the Airport Manger who oversees two dedicated full-time staff. Airport management is part of the Infrastructure Services for Woodlands County.

7.4 AIRPORT OWNERSHIP APPROACHES

There are a range of ownership, governance, and operation approaches that are utilized by airports across Canada. The relevance of these models varies by size, role and type of activity occurring at the airport. The spectrum of options available to an airport can range from closing an airport, up to the creation of airport authority that generally requires a minimum threshold of scheduled passenger service, and associated revenues, to be effective. For each option there can be different operating arrangements.

Airports can be owned and operated by a municipality or province/territory, although ownership of the latter is more typical in northern and/or remote areas. Airports with annual passenger volumes under 550,000 are more likely to be owned by municipalities, and this is mainly due to the implementation of the National Airports Policy in the 1990s. Transport Canada owns and operates 18 regional and remote airports throughout Canada. Municipal airports could be sold to a private organization, creating a privatized airport. The ownership and responsibility of an airport could also be shared among one or more partners, which may include public and/or private entities. Airports could also be owned by an airport authority; however, this is more common for larger airport operations.

An airport ownership model should be reflective of the type of goals an airport wants to accomplish. This decision has a large effect on the governance structure of an airport, influencing how decisions affecting the operations, planning, marketing and development of the airport will be made and executed.

7.4.1 PRIVATE OWNERSHIP / SALE OF AIRPORT

Certain municipalities that have owned airports have chosen to sell their facility to a private buyer. The airport owner (vendor) removes themselves of all involvement through the sale of the facility. The municipality will have no further involvement in airport ownership, funding, or managerial efforts. The municipality will also have minimal control following the sale over the activities that take place at the airport. Further, where a public entity such as a municipal government sells an airport to a private party, the risk is that the airport is run for profit, which

may not represent the previously held public interest. Generally, the value of most municipal airports is the land. The aviation operations and the potential regional benefits are often secondary to buyers, and if not financially self-supporting, could be at risk of ending. Additionally, the buyer may elect to close the airport and develop the lands for non-aviation purposes.

Selling an airport may be expensive if there are obligations to be met by the vendor. If an airport is sold, all risks and obligations are valued and become part of the sale price. In most cases, the cost to bring an airport into a simplified sale condition outweigh the price a potential buyer may be willing to pay. However, the sale of an airport is generally the simplest option as it relates to governance, as all long-term governance obligations are removed including the responsibilities associated with ownership, governance and operations.

Governance Model Case: Sale of Airport
Collingwood Airport

Location
Collingwood, Ontario

Vendor / Buyer
Town of Collingwood / Winterland Developments Ltd.

Airport Size
392 acres

Notes
Collingwood Airport was sold in 2019 for $4.1 million by the Town of Collingwood to Winterland Developments after a competitive bidding process between three proponents, and continues to be used as an airport.

7.4.2 MUNICIPALLY OWNED AND OPERATED (CURRENT MODEL)

In this model, an airport is owned, governed and operated by a municipal government. Oversight of the airport may take one of two forms: the airport could operate as a municipal department and report to that respective manager, or the airport could be the responsibility of an Airport Committee comprised all or in part of elected officials. Elected officials who are appointed to the Airport Committee are subject to frequent change and do not necessarily possess experience in planning, governing, or operating an airport. As elected councillors, committee members may have conflicting priorities when deciding what is best for their

constituents and the airport. Additionally, they may have many other responsibilities making it difficult to allocate sufficient time to airport planning, marketing and development matters.

The municipality has the responsibility to hire and manage the airport staff and ensure appropriate staff support activities (i.e. training, licensing, and benefits), creating an administrative burden. In the Municipally Owned and Contractor Operated model the municipality can shift the operational burden, including staffing, to a third-party contractor for a fee.

The municipality has direct control over airport planning and operations and carries liability for legal and regulatory obligations (including aviation safety regulations, employee safety, etc.). Financial responsibility and accountability remain with one municipal body (e.g. Woodlands County Council).

Although the municipality has control of the airport, there can exist financial risk. If losses are incurred, taxpayers will need to pay for them. However, airports, even when heavily subsidized, can act a catalyst for regional economic development, by providing both tangible and intangible economic benefits to the local community, and connecting the region to outside markets and centres of commerce.

Challenges faced by this ownership model include large amounts of municipal resources and managerial effort needed to operate and maintain the airport. Municipalities are also responsible for any financial, operational or legal issues that occur. Infrastructure improvements can also be difficult to fund within municipal budgets. Furthermore, airport staff are employees of the municipality and require contract negotiations. Airport staff may also be difficult to acquire as specialized airport knowledge is not normally part of a municipality’s skill set.

Governance Model Case: Municipally Owned and Operated
Lethbridge Airport (YQL)

Location
Lethbridge, Alberta

Owner / Operator
City of Lethbridge

Passengers
104,000 passengers (2019)

Notes
Operated under the direction of the General Manager, Real Estate and Land Development. The airport was recently transferred from County ownership to City ownership. Significant investment has occurred including infrastructure and terminal building upgrades. The operating staff have transferred as City employees.

Governance Model Case: Municipally Owned, Contractor Operated
Peterborough Airport (YPQ)

Location
Peterborough, Ontario

Owner / Operator
City of Peterborough / Loomex Group

Airport Size
55,000 annual aircraft movements

Notes
Loomex Group is responsible for the day-to-day management and operation of the facility, including maintenance.

7.4.3 MUNICIPALLY OWNED, OPERATED BY AIRPORT COMMISSION

This model shares select responsibility of airport ownership between a municipality and possibly one or more public organizations. Examples of these organizations can include another County, a Town, a City and/or multiple municipalities. A number of organizations may

also partner and manage a group of airports. This ownership structure can reduce the financial, operational and legal risks of a municipality by sharing it amongst partners;

An Airport Commission can be implemented to govern the airport. The Airport Commission can establish the strategic direction and operating of the airport, develop and oversee airport operating and capital budgets. It is ideal that the Airport Committee is structured to ensure a variety of skills beneficial to the airport are available among its members. Examples of commonly desired skills can include accounting, airport operations, legal, land development and construction. The required skill sets within the Airport Commission may evolve depending on the priorities of the airports. For example, if the airport is planning a runway rehabilitation, the Airport Commission may want a civil engineer as a member. It is most important that the Airport Commission represent the best interest of the airport and is not politicized to advance non-airport agendas. An accepted Airport Master Plan and regular updates can be an important tool in keeping the Airport Commission or other governing body focused on priorities. A shared ownership model can increase the amount of funds that would be available to an airport, providing opportunities to invest in and develop infrastructure on airport land. Partnering with other municipalities provides opportunity to establish regionally focused visions for the airport and shared economic prosperity. On the contrary, building a common airport vision and agreeing on sustainable airport funding can be challenging between jurisdictions.

Governance Model Case: Municipally and Partner Owned and Operated
Grande Prairie Airport (CYQU)

Location
Grande Prairie, Alberta

Owner / Operator
City of Grande / Grande Prairie Airport Commission (GPAC)

Notes
The GPAC is responsible for the management, operation and promotion of the airport, and regularly reports information to the City of Grande Prairie Council.

7.4.4 AIRPORT AUTHORITY OWNED AND OPERATED

The Airport Authority owned and operated model is most suitable for large airports with high volumes of commercial aircraft operations, where sufficient revenues are generated to make

the authority financially self sustaining and allow it to secure debt financing. Airport authorities are non-profit organizations established under the Canada Corporations Act. The authority's governance model is typically a board with representation from various levels of government and special interest groups. The authority has full power to plan, develop and operate the airport. In Canada, Airport Authority "ownership" is generally established through a long-term lease agreement where Transport Canada is the landlord and collects rent from the Airport Authority.

The Authority makes and implements all decisions concerning airport planning, operations, funding, development, customer relations, and meeting all applicable laws and regulations. This model is generally not applicable to a municipal airport.

Governance Model Case: Airport Authority
Calgary International Airport

Location
Calgary, Alberta

Owner / Operator
Transport Canada / Calgary Airport Authority

Airport Size
18 million passengers (2019)

Notes
The Calgary Airport Authority has been responsible for the operation, management and development of the airport since 1992.

7.4.5 PUBLIC-PRIVATE JOINT VENTURE

This model splits responsibilities between a public entity, such as the municipality owning an airport, and a private entity, such as an investment group. The public entity may own the airport while a private entity may invest and finance, and possibly manage and operate the airport in exchange for some portion of the revenue. There are several ways in which the division of resource input and responsibility may take place between the public and private entities. This model may be considered when a private organization makes up a significant portion of air traffic at the airport and/or there is financial incentive to invest. A public entity that owns the airport may seek private investment to cover the costs of owning and operating an airport and in return provide a portion of control over the airport to the private investor in exchange for revenues derived from airport rates and charges.

Location
Hamilton, Ontario

Owner / Operator
City of Hamilton / TradePort International Corporation (Vantage Airport Group)

Airport Size
955,000 passengers (2019)

Notes
Since 1996, TradePort has operated under a 40-year lease agreement with the City of Hamilton as the sole entity responsible for airport operations and management.

7.5 CONCLUSION

Through consultations, it appears there is interest in further investigating the possibility of Woodlands County sharing ownership of the Whitecourt Airport with the Town of Whitecourt, Town of Fox Creek and MD of Greenview, who benefit from the airport. The following steps are recommended.

- Woodlands County should review the desired outcomes from a change in ownership and governance of the airport and formalize them through the Airport Committee and a County Council resolution. This is a critical step in affirming the required ownership and governance model.
- Complete a formal engagement process to determine the interest of the potential partners and collect feedback on potential funding and governance model.
- Formalize the new ownership (e.g. legislation changes the sales agreement).
- Implement the new governance model.

An Airport Commission, with representation based on financial contribution, could be a viable governance model for the Whitecourt Airport and its partners. This model would remove the airport from direct political influence by the potential partnering jurisdiction and allow a focus on what is best for the airport and its associated regional prosperity. Similar airports in the province, such as Grande Prairie Airport, have successfully been governed by an Airport Commission. Once implemented, an Airport Commission or other governance body should consider a review of airport operations and service delivery as an early priority to ensure the operational model is best suited to meet the airport's mission.

8 AIRPORT APPROACH LANDS

8.1 INTRODUCTION

A variety of off-airport land use protections exist that place restrictions on developments in the vicinity of an airport to prevent incompatibilities between airports and use of surrounding lands. Through the implementation of Airport Zoning Regulations (AZRs), Airport Vicinity Protection Area (AVPA) by-laws, and municipal development and land use plans, municipalities can more effectively protect for continued airport operations while protecting sensitive areas such as residential neighbourhoods and schools from nuisances such as aircraft noise.

8.2 LAND-USE PROTECTIONS

8.2.1 AIRPORT ZONING REGULATIONS

Airport Zoning Regulations (AZRs) delineate inappropriate land uses and height restrictions, both human-made structures, such as buildings, and natural growth, such as trees. These restrictions exist to prevent the penetration of obstacle limitation surfaces (OLS), interference with aeronautical communication and radio navigation facilities, and bird and wildlife activity generating a hazard, as these elements may pose a risk to aviation safety. For example, restrictions could prevent:

- A cell tower or wind turbines from affecting circling minima or possibly closing a runway due to an impacted approach surface. They could also prevent power lines, trees, silos and high-rise developments from reducing a runway's landing distance or, in the worst case, a permanently closing the runway.
- Building of metallic structures such as power transmission towers within a certain distance of the airport, which could potentially reflect and distort signals from navigation aids.
- Land uses such as waste lagoons or landfills from locating near the airport, where resulting increases in bird and wildlife activity could pose a serious risk to aircraft operating at Whitecourt Airport.

AZR documents describe the applicable land use and height restrictions and provide the legal description for all lands affected by them. A series of maps, often referred to as a map-book, is prepared to varied levels of detail to illustrate the restrictive areas and the impacted lands. AZRs do not consider noise exposure forecasts (NEF), the metric used

to describe the cumulative noise impact of aircraft activity, as part of the planning protections offered.

CONSIDERATIONS

There are two routes for enacting AZRs:

- the federal process; and
- the federal/provincial process.

In the federal process, the federal authority, Transport Canada (TC), is responsible for establishing and administering the AZRs. While the federal government has the sole authority to put in place this protective measure, it may delegate responsibility for monitoring compliance with the AZRs to the provincial authority and the airport operator.

In the federal-provincial process, TC delegates authority to a provincial authority, which acts through a municipality. The arrangement is established through a by-law or formal agreement between the federal and provincial parties. This arrangement allows the municipality to enact a by-law to serve as the AZRs, limited in restriction to what is permitted in the agreement with the federal government. The airport operator, and the municipality if there is a shared accountability, are then responsible for monitoring and enforcing compliance with the AZRs.

At present, Transport Canada is not accepting new AZRs following the federal process. Updates to existing AZRs implemented following the federal process are still being undertaken; however, all new AZRs sought for airports without previous existing AZRs are following the federal-provincial process.

It should be noted that **AZRs are only permitted for certified airports** or for greenfield or brownfield sites that TC has strategically identified as a future airport site.

COST/TIME

The implementation of AZRs, especially following the federal process, can be expensive due to the costs involved in their creation. These costs include, but are not limited to: an updated survey of the airport, an intrusions assessment, a land title search, the preparation of a draft regulation, translation of the zoning regulations, the process of public consultation, and the distribution of the regulations and zoning plans to the parties affected by them. The cost and requirements of AZR implementation following the federal-provincial process is comparable to that of generating a new by-law by the municipality.

It is important to note that the cost of not establishing AZRs can greatly exceed the cost of implementing them, since it is easier to protect an airport from land use issues with a single instrument rather than dealing with separate issues as they arise. AZRs are generally seen as a necessary expense for municipalities who value the airport as a long-term asset to the

community. The implementation of AZRs can be a lengthy process due to the required amount of documentation, analysis and consultation. The process can take one to two years to complete.

ANALYSIS

Given that airspace is federally regulated, the AZR process is the only legislated means to enforce compliance with protections such as the OLS. Consultations have indicated the airport does not currently experience difficulties with obstacles in the obstacle limitation surface areas, incompatible development in the vicinity, or bird activity. The implementation of AZRs would present a proactive solution to protect against encroaching incompatible land uses or development heights and densities that may occur in the future. Because AZRs are a protection available only to certified airports, a decertified airport would forfeit any AZRs in place.

8.2.2 PROVINCIAL AIRPORT VICINITY PROTECTION AREA BY-LAWS

The Airport Vicinity Protection Area (AVPA) by-law is a form of provincial land use planning supported by the federal government that an airport or municipality may elect to adopt to afford some level of protection from incompatible land uses. The AVPA by-law typically presents setbacks and/or restrictions based on Noise Exposure Forecasts (NEF) and, on occasion, OLS and Bird Hazard Zones (BHZ). This protection is available to both certified airports and registered aerodromes.

The purpose of an AVPA by-law is to be a land use planning tool that focuses primarily on noise exposure to areas surrounding the airport. NEFs are created in the form of contours to identify noise-heavy areas near the airport where sensitive land uses such as residential areas are not advisable. The provincial authority may then choose to layer on additional restrictions, including OLS and BHZ to further deter incompatible land uses. The AVPA by-law document outlines the land use and height restrictions imposed as a result of the NEF, OLS and/or BHZ and provides descriptions of the land parcels affected by them.

CONSIDERATIONS

It is important to note that the OLS and BHZ components of an AVPA by-law are considered to be *ultra vires*, or beyond the jurisdiction of the provincial authority implementing them. Because aeronautics are the sole jurisdiction of the federal government, the implementation of OLS and BHZ may be deemed invalid if they are enacted by the provincial government instead of the federal counterparts. For this reason, AZRs may be considered, with the missing NEF piece implemented through a supporting AVPA by-law or Municipal Development Plan (MDP). However, the NEF is a metric endorsed by the federal government

for provincial land use planning around airports and as such the establishment of NEF contours and noise planning in an AVPA by-law would likely not be deemed *ultra vires.*

Under Alberta's Municipal Government Act, provincial authorities are permitted to define lands in the vicinity of an airport and make prescriptive regulations regarding the use and development of those lands. The AVPA by-laws do not afford the same level of protection as the AZRs and may be challenged and deemed *ultra vires* in a court of law unless AZRs are enacted to protect the AVPA. The purpose of the AVPA is to deter incompatible development from lands near the airport as well as to be good neighbours to neighbouring lands by preventing sensitive land uses from locating where they may be disturbed by regular airport activities.

The appropriate layering of OLS and/or BHZ information onto an AVPA by-law happens when existing AZRs are already in place for the airport and the provincial authority or municipality are electing to identify the OLS and/or BHZ restrictions in the AVPA by-law as well. However, this practice is not common. Although the inclusion of OLS and/or BHZ may be deemed *ultra vires* by a court of law, it may still be beneficial to have these two elements in the AVPA by-law. There have been cases in Ontario where these additional protections have been successfully implemented, for example to protect instrument flight procedures against the impacts of wind farms, which would otherwise reduce airport accessibility and specifically increase instrument minima. In these cases, the OLS component of the AVPA have been largely successful tools and helped in the negotiation process with developers of land near the airport.

COST/TIME

The cost of implementing an AVPA by-law is comparable to that of establishing AZRs following the federal-provincial process. Similar to AZRs, the implementation process may be costly and lengthy due to the amount of analysis work to be done along with surveying and consultant costs. For smaller airports such as Whitecourt Airport, the process may take up to a couple of years to implement.

ANALYSIS

The implementation of an AVPA may be useful to mitigate encroaching development as the Town of Whitecourt continues to expand. The regulations could be used to supplement the existing provisions in the Municipal Development Plan and Land Use By-law in place at the Town of Whitecourt and Woodlands County.

The AVPA by-law is a worthwhile investment as it is an easily referenced standalone document that is backed and vetted by Transport Canada. However, the AVPA by-law and level of protection it offers is not a suitable replacement for AZRs.

8.2.3 MUNICIPAL DEVELOPMENT PLAN AND LAND USE BYLAW PROVISIONS

A Municipal Development Plan (MDP) is a tool used by municipalities to provide a vision and policy framework to guide future growth and development in the community. The MDP provides broad policies that relate to the development of different land uses and may contain provisions to indirectly help limit land uses incompatible with airport and aviation activities from locating near the airport. Currently, there are three local MDP documents in place: the Woodlands County and Town of Whitecourt Intermunicipal Development Plan (IDP); the Woodlands County MDP; and the Town of Whitecourt MDP. At present, the IDP and Woodlands County MDP contain policies and guiding statements that are geared toward avoiding development incompatible with the airport from locating near it.

A Municipal Land Use Bylaw (LUB) implements the policies and goals in the Municipal Development Plan (MDP) to manage growth and development in the community. It provides a legal way for a municipality to control land uses in the community to ensure that incompatible land uses are not located near each other. The current LUB in place are the Town of Whitecourt Land Use Bylaw and the Woodlands County Land Use Bylaw, the latter of which has provisions in place for development on or around Whitecourt Airport

Another planning tool that may be used by a municipality to influence land uses around an airport is an Area Structure Plan (ASP). The ASP provides details on development sequence, land uses, population densities and locations of public utilities and significant transportation

routes for a specific area in a municipality. ASPs may be developed to provide further guidance and detail on areas surrounding airports that is not provided in the MDP or LUB documents. However, each ASP must be consistent with its superseding Intermunicipal Development Plan (IDP). ASPs that cover airport lands may be based on existing Airport Development Plans to identify future infrastructure needs or impacts on surrounding land uses when the airport expands.

CONSIDERATIONS

The MDP may be used to indirectly limit land uses that conflict with the airport by establishing zoning for typical land uses that do not conflict with airport operations. For example, the MDP and LUB may set out provisions for agricultural areas or light and heavy industrial areas adjacent to an airport. These tools may also limit building heights and development densities adjacent to an airport. The MDP can adopt NEF contours into land use plans to further restrict the placement of noise sensitive areas such that they are not located near airports. The LUB may work alongside the MDP to be used to indirectly limit land uses that conflict with the airport.

It is critical to note the federal government has sole jurisdiction to regulate matters integral to aeronautics, air navigation and air transport. As such, municipal planning tools such as the MDP should not attempt to regulate matters or enforce standards that directly relate to aeronautics and aeronautical uses of airport lands, which may include, but are not limited to, hangars, runways, aprons, taxiways, air terminal buildings, graded areas and aeronautical facility sightlines. Based on past court rulings of similar instances, regulating such matters may be deemed *ultra vires* by a court of law and may be nullified. Furthermore, municipal policies or restrictions enacted through the MDP or LUB to protect the airport directly may be also deemed *ultra vires*. When developing provisions for municipal planning tools related to the airport, it is advisable to seek legal advice from a lawyer who is qualified to practice in the field of aviation law.

COST/TIME

At present, some provisions related to development around the Whitecourt Airport already exist in the MDP and LUB documents for Woodlands County and the Town of Whitecourt. As such, amendments to the current MDP and updates in future iterations would likely require less time, effort and fewer costs than the AZR and AVPA options, except where additional analysis may be warranted to create new policies. In certain cases, additional time may be required for public consultation. The timeframe within which these provisions can be released may depend on the update and review timelines in place with the municipal authority that

conducts these operations. For example, certain plans are reviewed and updated every given number of years.

ANALYSIS

The MDP and LUB municipal land use planning tools remain an option for indirectly influencing development in the vicinity of the airport to prevent airport-incompatible uses from locating in the area. However, there are limits on what a municipal planning tool is able to accomplish to protect an airport from incompatible development. Without a more substantial, standalone aviation-related document such as an AVPA by-law or AZRs, it will be difficult to protect the airport over time as the Town of Whitecourt expands outwards and encroaches the airport.

8.3 CONCLUSION AND RECOMMENDATIONS

The above sections have introduced AZRs, AVPA by-laws, MDPs and LUBs as planning tools that can be used to deter or protect an airport from incompatible land uses locating in the area. The protections' benefits and drawbacks are summarized in Table 8.1 below.

Table 8.1: Comparison Summary of Airport Land Use Protection Measures

Off-Airport Land Use Protection Measure	ROM Cost	Protection Offered	Benefits	Drawbacks
Airport Zoning Regulations (AZRs)	$60,000 - $100,000	✓ OLS ✓ BHZ	• Provides wide range of protections • Fully authorized by TC	• Available to certified airports only
Airport Vicinity Protection Area (AVPA) By-law	$40,000 - $50,000	✓ NEF ✓ OLS* ✓ BHZ*	• Available to both certified and registered aerodromes	• NEF is the only AVPA by-law component that is within provincial jurisdiction. • Limited in scope and power
Municipal Development Plan (MDP) / Land Use By-law (LUB)	$15,000 - $30,000	✓ Basic land use compatibility	• Relatively inexpensive and quick to implement	• Limited in scope and power • Inability to directly protect the airport

* May be deemed *ultra vires* by a court of law and made invalid.

Given the wide range of protection it provides, the implementation of AZRs following the federal-provincial process, along with a basic AVPA by-law focused on noise, is the recommended solution to provide additional future protection to the airport. These protections will proactively help ensure the viability of Whitecourt Airport as the Woodlands County and Town of Whitecourt grow around the airport. The AZRs and AVPA may further be supported

by municipal planning tools such as MDP or LUB provisions, which would indirectly protect the airport from incompatible development.

For the AZRs to remain a valid option, the Whitecourt Airport would have to be maintained as a certified airport.

In the case of land use planning, it is good practice to enact protective measures, such as regulations, proactively before land use conflicts become apparent. To do so will require knowledge and continuous monitoring of long-term airport and municipal plans and goals.

8.4 NEXT STEPS

The following are next steps associated with providing long-term protection of the airport.

Table 8.2 – Airport Protection Measures Next Steps

AIRPORT PROTECTION	NEXT STEPS
Short Term (1 to 5 Years)	➢ Prepare Airport Vicinity Protection Area Plan (AVPA) to ensure land uses surrounding the airport do not impact the long term operational and commercial viability of the airport.
Medium Term (6 to 10 Years)	➢ Prepare Federal-Provincial Airport Zoning Regulations (AZRs).

9 CERTIFICATION REVIEW

9.1 INTRODUCTION

The purpose of this section is to introduce the three categories of aerodromes, outline the regulatory and resource requirements for registered aerodromes and certified airports, and compare the benefits and drawbacks to either maintain Whitecourt Airport's status as a certified airport or to decertify and surrender the airport certificate.

In Canada, there are three categories of aerodromes:

- Unregistered Aerodrome: An unregistered aerodrome is an airstrip, generally on private property, that is not registered or certified.

- Registered Aerodrome: An aerodrome that has met the requirements defined in Canadian Aviation Regulations (CARs) Part III, Subpart 1 and has been registered by the Minister. Examples of these basic requirements include but are not limited to: markers and markings, wind direction indicators, runway lighting (if used at night), prohibitions and fire prevention. The operator of a registered aerodrome is required to comply with these regulations and notify the minister of any changes in the aerodrome's condition. Failure to do so may result in Transport Canada's denial to register an aerodrome.

- Certified Airport: An aerodrome that has been certified under CARs 302.03 in CARs Part III, Subpart 2 and is subject to a stricter standard of safety. The terms "certified aerodrome", "certified airport" and "airport" can be used interchangeably to describe this type of aerodrome; however, to minimize ambiguity, the term "certified airport" will be used in this section.

Transport Canada retains enforcement and oversight authority over all aerodromes, regardless of what category the aerodrome falls under or its current status.

9.2 REGISTERED AERODROME REQUIREMENTS

Registered aerodromes are aerodromes that have been registered by the Minister under CARs 301.03 in Part III, Subpart 1. To become registered, information about the aerodrome's location, marking, lighting and operations must be submitted to the Minister and be compliant with the requirements in Subpart 1. The registered aerodrome's information is published in the Canadian Flight Supplement (CFS) or Canadian Water Aerodrome Supplement (CWAS), whichever is applicable. The aerodrome may be inspected by Transport Canada as required,

but registration does not require regular inspections or compliance with TP 312 Aerodrome Standards and Recommended Practices. However, a good practice for registered aerodromes is to maintain compliance with TP 312 and have a robust safety system in place and will be particularly beneficial in the event that certification is pursued at a later date.

9.3 CERTIFIED AIRPORT REQUIREMENTS

Certified airports are aerodromes that have been certified by the Minister under CARs 302.03 in CARs Part III, Subpart 2. Certified airports have much stricter regulatory and resource requirements than registered or unregistered aerodromes. Transport Canada defines three applicability criteria that necessitate the need for a certified airport. The three applicability criteria are listed in in Figure 9.1.

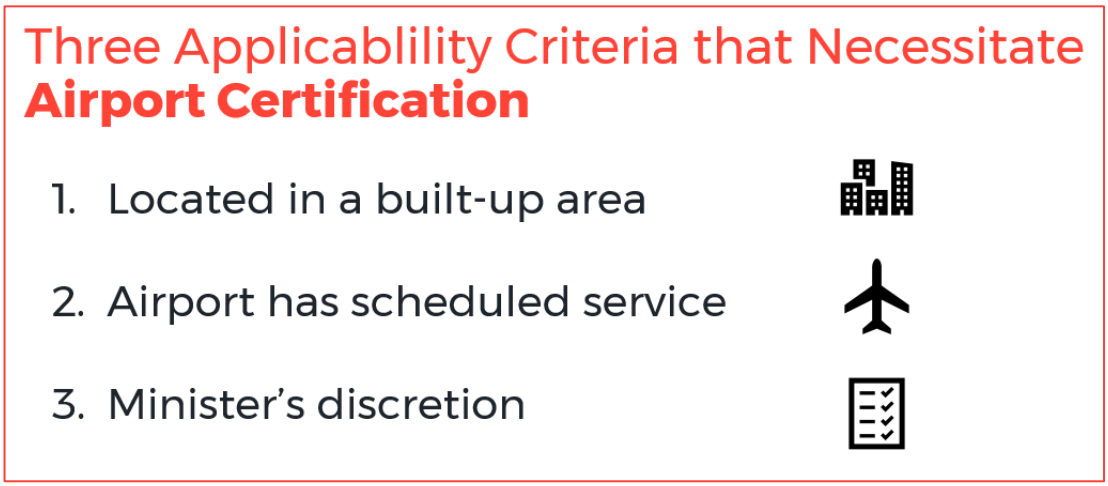


Figure 9.1 - Airport Certification Criteria

Transport Canada determines if the airport is in a built-up area of a town or city using its Built-Up Area Assessment Tool for CAR 307. An airport is considered to have scheduled air service if a publicly available air transport service that provides transportation for passengers between points and serves those points in accordance with a published schedule at a charge per seat is present. Under the Minister's discretion, it is decided that an airport certificate would be in the public interest or would contribute to the safe operation of the aerodrome. Currently, none of the three criteria are applicable to Whitecourt Airport.

9.4 REGULATORY REQUIREMENTS

To be compliant with the Canadian Aviation Regulations (CARs), a certified airport must comply with Parts I – General Provisions and Part III – Aerodromes, Airports and Heliports,

Subpart 2 – Airports. The sections in the CARs that specify requirements for certified airports include:

- CAR 106.01 - Accountable Executive;
- CAR 107.01 - Safety Management System Requirements;
- CAR302 – Subpart 2 – Airport Regulations;
- CARs Standard 322 – Airports; and
- TP 312 – Aerodrome Standards and Recommended Practices.

A certified airport must be compliant with the edition of TP 312 that was in force on the day that the airport was certified. In the case of Whitecourt Airport, which was certified in 2017, TP 312 5th Edition had been the current version of the standard in force. The airport must therefore comply with standards in TP 312 5th Edition, or any approved deviations from it, until any facilities are upgraded, in which case the most current version of TP 312 in force must be complied with for the upgraded facility. As of March 2020, TP 312 5th Edition Amendment 1 is in force, which is the version of the standard that all upgrades and new developments would need to comply with until it is superseded by a newer version.

Certified airports can benefit from grandfathering provisions, such that until a facility is rehabilitated or improved it may continue to be compliant with an older edition of TP 312 that was in force at the time that the facility was built. If the Whitecourt Airport maintains certification, newer standards will not necessarily apply to it; all existing infrastructure and facilities may maintain their existing level of certification.

The CARs describe the specific obligations that a certified airport must comply with. General obligations include airfield inspections, maintaining records, ensuring all processes and policies are adhered to as well as developing, upkeeping and maintaining operational manuals and programs. All certified airports are required to appoint an accountable executive (AE), an individual working within the organization who accepts full responsibility for the certified airport's current and on-going compliance with the CARs and oversees all certified airport activities authorized by the airport certificate.

A certified airport must develop, upkeep and maintain operational programs and corresponding documents describing them, which must be submitted to the Minister when first developed, whenever amendments are made, and upon request. These documents include the Airport Operations Manual (AOM), Safety Management System (SMS) Manual, Airport Wildlife Management Plan (AWMP), Airport Emergency Response Plan (AERP), Airside Vehicle Operation Program (AVOP) Manual and the Preventative Maintenance Plan (PMP). While the AVOP and manual in itself is not a requirement, it is a standard industry practice to comply with CARs 302.08(4)(c)(x), that describes the need for airports to restrict

access to and have control procedures for movement areas. Airport staff that have duties related to any of the required programs above must have specific training related to these duties.

A certified airport is also required to collect, record and retain information concerning various airport activities and events. Airside hazards, incidents and accident information must be collected as part of the Safety Management System. The results of periodic movement area and visual aid inspections must be regularly collected to demonstrate on-going compliance with applicable regulations and standards. Wildlife strike data, aircraft movement statistics and aircraft types must be recorded and updated as necessary. Finally, documentation and supporting records from quality assurance audits must also be retained as records.

The specific documentation, program and information collection obligations are summarized in Table 9.1.

Table 9.1 – Documentation, Program and Information Collection Requirements for Certified Airports

DOCUMENTATION PROGRAMS	INFORMATION COLLECTION
➢ Airport Operations Manual (AOM); ➢ Safety Management System Manual (SMM); ➢ Airport Wildlife Management Plan (AWMP); ➢ Airport Emergency Response Plan (AERP); ➢ Airside Vehicle Operation Program (AVOP) Manual; and ➢ Preventative Maintenance Plan (PMP).	➢ Airside Hazards, Incidents and Accidents; ➢ Periodic inspection of movement areas and visual areas; ➢ Wildlife strike data; ➢ Aircraft movement statistics; ➢ Aircraft types; ➢ Ecological studies and wildlife inventory; and ➢ Quality Assurance Audits (every 3 years).

9.5 RESOURCE REQUIREMENTS

The cost of operating and maintaining a fully compliant certified airport is greater than that for a registered aerodrome because a certified airport must be compliant with many more regulations. The overall level of safety at a certified airport can be expected to be greater with the trade-off of additional operating costs when compared to other aerodrome categories.

This section expands on the resource implications of maintaining certification, taking into account staffing and financial resources**.**

Certified airports typically have greater staffing requirements than registered aerodromes, due to the increased amount of effort required to meet the regulatory requirements of certification. At present, Whitecourt Airport employs four full-time staff: an airport manager and three airport operations employees. The Accountable Executive position is another staffing requirement that all certified airports must consider and fill. Just as with any other aerodrome, airport growth and increased infrastructure may require more staff to manage day-to-day operations and recurring tasks. This may be increased for certified airports considering their obligations to demonstrate on-going regulatory compliance.

Human resources are required for compliance with additional regulation and meeting additional standards due to certification. Examination indicates a minimum of half of a full-time equivalent position is typically required to meet regulatory requirements at airport of similar size and complexity of Whitecourt.

A Transport Canada regulated Safety Management System (SMS) should consider all airport activities. The management of an SMS can be labour intensive. As such, many mid to larger-sized certified airports employ an individual, such as an SMS Manager, or team that is solely responsible for the SMS and/or Regulatory Affairs. Smaller certified airports may engage third party SMS expertise, typically provided by an aviation consultancy, to support SMS in lieu of increasing and training staff. Annual budgetary requirements for staffing or external support must be planned for, as well as initial and recurrent training costs and other administrative expenses related to regulatory compliance tasks.

Quality assurance auditing is another considerable expense faced by certified airports. On top of consultant time and fees, the airport operator is required to address the findings of each audit as well as to create and implement Corrective Action Plans. A robust quality assurance audit is a comprehensive inspection of the airport and airport processes; as such, post-processing activities are time-consuming, which may further increase staffing needs at the Airport. Since Whitecourt Airport was certified in 2017, the airport is due for a full Quality Assurance Audit in 2020.

Because certified airports are required to meet more stringent operations and infrastructure standards, another financial consideration is airfield maintenance to ensure that the airport meets or exceeds the required thresholds described in the applicable edition(s) of TP 312 for maintaining certification. For example, in the case of airfield lighting maintenance, TP 312 section 9.1.3.1 provides thresholds for lighting system light failures; once the threshold of light failures is exceeded, the lighting system is considered unserviceable. However, while

registered aerodromes are not held to the same standard as certified airports, a basic level of safety and serviceability should be ensured. If the Whitecourt Airport was to be decertified, much of the costs associated with maintaining safe and functional infrastructure would remain, as it is incumbent on the operator of an Aerodrome to maintain a safe facility for the users. One significant difference is that the certified airport would need to maintain documentation of the inspections, and demonstrate compliance, whereas a registered aerodrome would simply need to maintain a safe operation.

A typical financial trend for newly certified airports shows budgets reaching a peak in the year that the airport is certified, which are typically costs required to bring the aerodrome infrastructure to the state required by standards in addition to cost associated with certification. The budgets typically fall within a few years after certification, though overall post-certification budgets are typically larger than pre-certification budgets to reflect increased maintenance and administration costs. The financial data for Whitecourt Airport reflects a similar trend – the pre-certification budgets were lower than those after certification, with a large spike in budget in the year of certification and the year after.

A specific cost associated with operating Whitecourt as a certified airport versus a registered acrodrome could not be determined due to the lack of historical data and because the airport has been certified for less than 3 years. Airport management recommends that if the Whitecourt Airport were to decertify, most of the regulated obligations associated with a certified airport would be maintained. This approach is consistent with the common recommendation that registered airports should use certification practices including documents as a framework for development of a program that is practical while focusing on safety and maintaining operational efficiency and overall airport goals. The potential savings are expected to be limited to reduced engagement with Transport Canada, removal third party quality assurance audit requirement, and reduction in staff responsibility regarding maintenance of certification. A rough estimate places these annual cost savings at around $100,000-$150,000. The accuracy of this figure would be improved with in-depth analysis of current airport financial information.

9.6 CERTIFICATION VS DECERTIFICATION

This section provides a detailed discussion of the advantages and disadvantages of maintaining airport certification, which results in a certified airport, and decertifying the airport, which results in a registered aerodrome.

9.6.1 MAINTAINING CERTIFICATION: ADVANTAGES AND DISADVANTAGES

Maintaining Whitecourt Airport's certificate could potentially yield several benefits. Maintaining certification would allow the exemptions and grandfathering advantages in place at the time of certification under TP 312 5th Edition in 2017 to continually apply as long as the facility or element is not upgraded. This grandfathering aspect could prove advantageous when future editions of TP 312 come into force, such that the airport would not be required to implement potentially costly infrastructure upgrades to meet the current standards to be in a state of regulatory compliance.

Furthermore, only certified airports are eligible to enact Airport Zoning Regulations (AZRs), which are a form of off-airport land use protection that restrict the heights of structures and natural growth as well as land uses in the areas surrounding the airport to protect the safe operation of the airport and aircraft. Should the airport require AZRs in the future due to encroaching incompatible development, Transport Canada will only entertain the request if the airport is certified.

Only certified airports are permitted to have scheduled service for passenger transport. As such, certification can be a marketable commodity to interested businesses seeking to operate out of the airport. New business opportunities from scheduled services may further diversify the economy of Woodlands County. Certified airports are required to maintain many layers of safety, which would also be more attractive to air operators seeking to operate in the Duvernay natural gas formation. The attraction of new businesses to Whitecourt Airport would increase economic diversification and community resiliency, which aligns with the strategic objectives for Woodlands County and the Town of Whitecourt.

Finally, the infrastructure and maintenance requirements associated with complying with certification requirements also have benefits for Whitecourt Airport. Maintaining airfield infrastructure in accordance with the applicable TP 312 standards could contribute to increased air operator and tenant satisfaction, possibly attracting new tenants to the airport.

However, certifying and maintaining the certification of an aerodrome involves significant time and resource commitments. The administrative burden of maintaining the certificated operations at a certified airport can be significant. Also, ensuring that all tasks required by the regulations are undertaken and that all requirements are complied with may result in the increased interactions of regulatory authorities such as Transport Canada.

Table 9.2 – The Advantages and Disadvantages of Maintaining Airport Certification

ADVANTAGES	DISADVANTAGES
➢ Exemptions and grandfathering remain in place until upgrade of facilities; ➢ Ability to enact Airport Zoning Regulations (AZRs); ➢ Ability to have scheduled services; and ➢ Increased air operator and tenant satisfaction.	➢ Greater administrative and financial burden compared to registered aerodrome; and ➢ Increased presence of regulatory authority.

9.6.2 DECERTIFICATION: ADVANTAGES AND DISADVANTAGES

In comparison to certified airports, registered aerodromes are less expensive to operate and maintain since they can require fewer staff, resources and time-consuming activities to meet additional regulation and standards. A newly decertified airport may benefit from cost savings with reducing the amount of staff hours required to comply with additional regulation and meeting additional standards spent due to decreasing responsibilities for administrative tasks. The reduction could be realized due to decreased administrative burden from no longer being required to conduct quality assurance audits, emergency exercises and maintaining documentation at the standard required of certified airports. Decertification may also result in the decreased presence of regulatory authorities such as Transport Canada due to the aerodrome having fewer regulatory obligations.

However, by decertifying, an airport forgoes any existing TP 312 grandfathering protections since the time of certification. If the airport chooses to pursue certification again in the future after decertifying, the latest edition of TP 312 would apply. When meeting the new TP 312 requirements, it is possible that extensive investment would be required to bring the aerodrome to a state of compliance with these latest standards, which could be a difficult, lengthy and expensive process. Additionally, if Whitecourt Airport requires protection from encroaching incompatible land uses in the future, AZRs would not be available if the Airport is decertified. Finally, a registered aerodrome is unable to accommodate scheduled service, which is only permitted with a certified airport. Opportunities for implementing scheduled service could be missed as recertification can be lengthy and air service opportunities are typically time sensitive.

Table 9.3 - The Advantages and Disadvantages of Decertification

ADVANTAGES	DISADVANTAGES
➢ Reduced administrative and financial burden compared to certified airport; and ➢ Decreased presence of regulatory authority.	➢ Exemptions and grandfathering from 2017 certification are lost; ➢ Difficulty to re-certify airport; ➢ Inability to enact Airport Zoning Regulations (AZRs); and ➢ Inability to have scheduled service.

9.6.3 AIRPORT DECERTIFICATION PROCESS

If the decision to decertify is made, four (4) steps would need to occur before the airport is officially decertified. Figure 9.2 describes a proposed series of steps and key considerations to be undertaken and timeline for doing so if the airport chose to surrender the airport certificate and pursue airport decertification. Altogether, the process is estimated to take between one and two years.

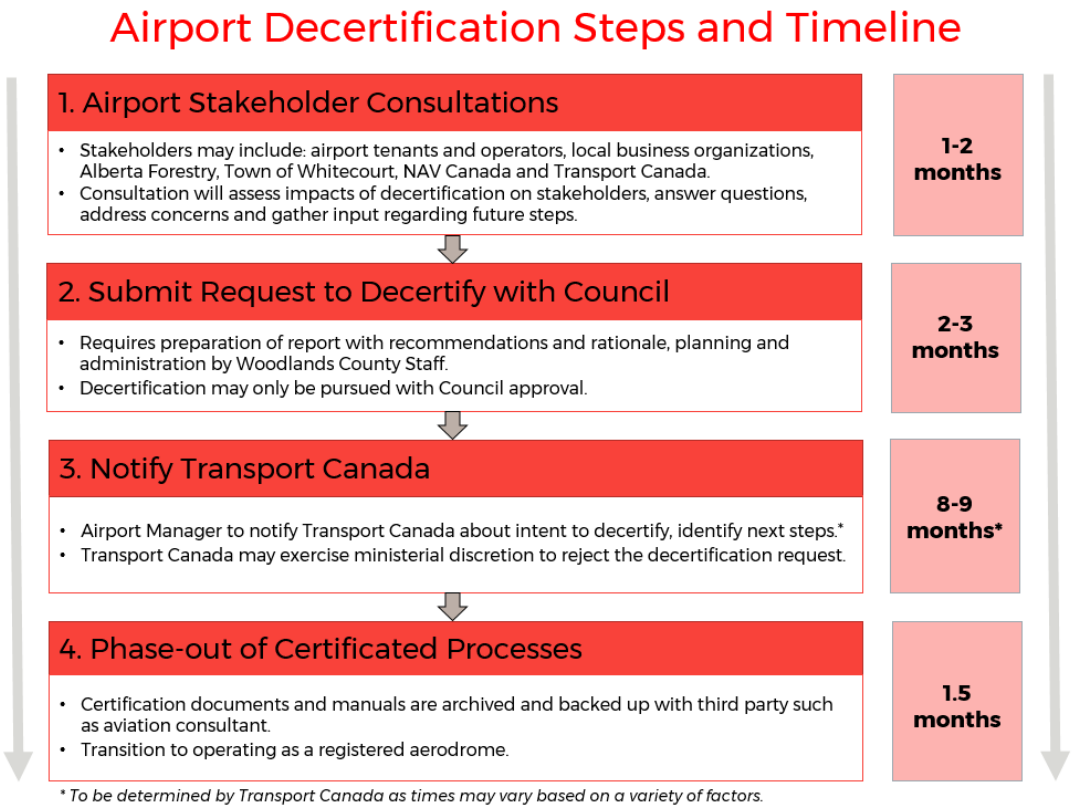


Figure 9.2 - Steps, Key Considerations and Timeline for Decertification Process

Before any decertification activities can occur, the first step would be to hold consultations and engage with the stakeholders associated with Whitecourt Airport. Ideally, these consultations would involve a broad spectrum of parties, including airport tenants and operators, local business organizations, Alberta Forestry, air ambulance operators, the Town of Whitecourt, NAV Canada and Transport Canada - any party that may be affected directly or indirectly by this change. The consultations would gather information about the impacts of decertification on the stakeholders and be an opportunity to answer questions, address concerns and gather input regarding future steps. The planning and preparation for the consultation, advance notice of consultation and proper dissemination of information to interested parties and the consultations themselves are in total estimated to take about 1-2 months.

Following the consultation phase, a request to decertify the airport would need to be brought before Woodlands County Council. Such a request would be accompanied by a report containing recommendations and rationale for decertification, the impacts of decertification analyzed by applicable Woodlands County staff. Provided that these steps are successfully completed, the County would be able to review the request to decertify. This phase is estimated to occur over 2-3 months.

Once the request to decertify Whitecourt Airport is approved by Council, the next stage would be to officially notify Transport Canada that Woodlands County is surrendering the airport certificate and as such decertifying Whitecourt Airport. Next steps to facilitate the process would be discussed with Transport Canada as well. It should be noted that Transport Canada may exercise ministerial discretion and reject the decertification request if it is deemed that an airport's certification is necessary based on factors ranging from safety assurance to regional necessity. This process is estimated to take around 8-9 months but the process time may vary depending on many different factors.

Once the decertification has been formally approved by Transport Canada, the phase-out of certificated processes would occur. In this stage, documents that were required for certification, such as the Airport Operations Manual or Safety Management System Manual, would be archived. A copy of the documents would ideally be given to an external party, such as a qualified aviation consultant, to have additional back-up in the event that the airport decides to re-pursue certification in the future and the original documents cannot be found. Whitecourt Airport would then transition to operating as a registered aerodrome. This process is estimated to take about a month and a half to complete.

9.6.4 RECOMMENDATIONS

Given the current range of opportunities available to Woodlands County, **it is recommended that Whitecourt Airport remain certified** to take full advantage of the certification benefits listed above, particularly keeping exemptions and grandfathered elements in place, the ability to enact Airport Zoning Regulations and having more regulated safety standards. These advantages are expected to benefit the long-term growth and prosperity of the airport and region.

10 MARKETING PLANS

10.1 INTRODUCTION

An airport's sustainability and growth requires strategic marketing initiatives aligned with local needs and objectives. This section introduces a Preliminary Marketing Strategy to provide targeted direction with respect to development opportunities identified in the Airport Development section (Section 4).

10.2 MARKETING GOALS

10.2.1 COMMERCIAL DEVELOPMENT

With targeted development goals, Whitecourt Airport may serve as a catalyst for regional economic development, in addition to its core function as a transportation facility. The commercial development marketing goals prioritize the development priorities identified earlier in the report, including:

- Attracting maintenance/repair/overhaul (MRO) and fixed base operator (FBO) service providers and providing amenities at the airport;
- Developing business parks and light industry employment areas; and
- Attracting and retaining novel agricultural and energy uses.

The following preliminary goals have been identified:

Retain current tenants: The existing tenants at Whitecourt Airport serve three purposes. First, they contribute to the municipal tax base and regional economy. Second, they anchor the business park and generate credibility for prospective tenants. Third, their presence may facilitate the introduction of new tenants, who may find synergistic benefits from their operation.

Attract new non-aviation tenants: Non-aviation tenants represent an area of potential growth and opportunity to increase revenues at Whitecourt Airport. These tenants can improve the overall economic impact of the airport to Woodlands County and could include: agriculture, aquaculture or verticulture plants; light manufacturing; transportation services; truck repair facilities; logistics centres and warehouses, and businesses supporting the resource industries.

Attract new aviation tenants: Whitecourt Airport has the infrastructure and land availability to attract and accommodate new aviation tenants. This could include fixed and rotary wing aircraft repair, air charter operators, FBOs, corporate aviation, and air cargo operators.

Improve awareness: Awareness of Whitecourt Airport among the local public and a greater presence in the region, including the County, the Towns of Whitecourt and Fox Creek and MD Greenview, and their economic development initiatives, is critical to the airport's future development potential. The awareness of projects related to Whitecourt Airport and associated employment centres must be generated among the public, business community, and municipal and provincial politicians to ensure that future capital improvements are supported. Unless the Whitecourt Airport and its value to the region is widely known, future infrastructure improvements may be deferred in favour of other high-profile projects in the community.

Following the formalization of commercial development goals by the airport governance structure, associated objectives should be further defined. The following preliminary objectives are offered as a starting point for refinement based on preliminary goals:

Enhance Tenant Engagement: Current tenants should be engaged on a regular basis to identify concerns or changes that could improve their operations at Whitecourt Airport. Engagement can be completed using a variety of mediums including emails, phone calls, and in-person meetings. Engagement could be further enhanced by hosting a regular airport tenant appreciation event, which could also serve as an information gathering and networking session (e.g. annual lunch).

Enhance Community Engagement: Provide opportunities for the community to engage with airport staff tenants through events such as an open house, or charitable events that raise money for community charities. Engage local businesses and resource industries to be part of the events.

Establish Strategic Partnerships: Several local organizations have a shared goal of enhancing regional economic prosperity. Parties such as the Whitecourt Economic Development Committee can offer a wealth of information and a network that can be leveraged to attract new tenants. The committee should be a strategic partner to help promote the airport to not only the Town of Whitecourt, Woodlands County, Town of Fox Creek and MD of Greenview, but also the province of Alberta. Industry networking activities such as conferences and conventions are opportunities to present key airport commercial development messages as a speaker or attendee. Examples include the Canadian Aerospace Summit, Canadian Business Aviation Association Convention, and the Canada Aviation Summit.

Complete a full Economic Impact Assessment (EIA): As discussed in the Socioeconomic Impact section (Section 3), an EIA quantifies the contribution of Whitecourt Airport to the regional economy. The analysis should be elaborated upon and the findings communicated to the public, Council, and industry stakeholders to improve awareness of Whitecourt Airport and its role in the regional economy beyond Woodlands County. The EIA can also serve as a baseline against which to measure future growth from development. The publishing of EIA findings also recognizes the value of existing tenants. EIAs should be regularly updated in response to changes in the economy and business at the airport.

Augment Online Presence: The Whitecourt Airport website has minimal information with respect to commercial development. A new page should be added specifically for development opportunities that includes contact information, lease information, and servicing information. Marketing and promotional materials can also be uploaded to this page. Additionally, the County should establish the airport's presence on social media sites such as Facebook and Instagram to generate interest and built the airport's brand.

10.2.2 AIR SERVICE DEVELOPMENT

There is a strong desire within Woodlands County to attract both passenger and non-passenger flights to domestic destinations. Whitecourt Airport air service development resources should be focused on the following prioritized preliminary air service goals that will address challenges and capitalize on opportunities:

Attract new unscheduled air services: Examples of unscheduled air services may be air cargo/courier operators and ad hoc passenger charters. Examples could include leisure charters to urban centres such as Calgary and Vancouver and ski destinations. As an example, a local travel agent in Peterborough, Ontario, organizes occasional weekend charter flights to New York City.

Undertake a travel demand survey: The survey would aim to determine local air travel demand, examining the number of annual trips from the Whitecourt catchment area through Edmonton International Airport and/or the regional airports where schedule air service is available. The data from this study would identify regional air travel demand and key destinations. The data could form part of marketing materials presented to prospective air carriers to support a business case for introducing direct air service into Whitecourt Airport.

Develop Enhanced Relationships with Incumbent Charter Airlines: Channels of communication with Sunwest Aviation and Central Mountain Air should be enhanced through regular meetings, exchanges of information, and the increased involvement of airlines at local events such as sponsorships and partnering with local organizations. The region and

partners should invest in regular exchanges of information; meetings with the airline route planners should be convened with an emphasis on market research. Communications should emphasize the provision of updated market information that is not readily available, as well as understanding of changing airline needs. Supported by the provision of viable business cases, enhanced services should be requested from the existing air carriers, which may include increased frequencies, larger aircraft, and improved schedules.

Seek New Air Service: Whitecourt Airport should investigate the opportunity for scheduled air services utilizing third-tier regional airlines operating into private air terminals at airports such Calgary International Airport. Any pursuit of additional air carriers should be approached with caution. If not pursued strategically, these efforts could adversely affect the established relationships with Sunwest Aviation and Central Mountain Air. Prior to engaging new airlines, Woodlands County should carefully consider how well established are existing air services, whether sufficient market demand is present, and what comparable routes exist at competing airports.

10.3 OPPORTUNITIES AND CHALLENGES

10.3.1 OPPORTUNITIES

Opportunities are attributes of Whitecourt Airport that contribute to meeting goals and objectives, which should be maintained and leveraged. The following opportunities are supported by the stakeholder consultations conducted in March 2020:

Location: Whitecourt Airport is well-positioned with short driving times to the Town of Whitecourt (10 minutes) and a range of rural and urban municipalities.

Land Availability: The western and southwestern parts of the airport are undeveloped and can be prepared flexibly according to tenant needs. Large-scale tenants can be accommodated that may not be able to locate within the Town of Whitecourt, and the rural-industrial context of Whitecourt Airport means that industrial and commercial tenants can be accommodated with minimal compatibility constraints.

Existing Tenants: The existing businesses at Whitecourt Airport can offer synergistic benefits for new tenants. New industrial businesses may be able to find a market niche by supporting existing businesses.

10.3.2 CHALLENGES

COMMERCIAL DEVELOPMENT

Challenges affecting Whitecourt Airport must be overcome in support of commercial land development goals:

Competition: Attracting new tenants to Whitecourt Airport is limited by two forms of competition:

- Other business and industrial parks exist in the County at which new non-aviation businesses can locate. However, as growth at these parks is occurring locally and benefiting the regional economy, these facilities should be viewed as complementary entities and not as harmful competition.
- Whitecourt Airport competes with other regional airports and provincial airports that are similarly trying to attract new aviation-related businesses.

Lack of Marketing: A review of marketing efforts identified little active promotion of Whitecourt Airport as a site option for new tenants. Minimal information was found on the Whitecourt Airport, Woodlands Country, or Town of Whitecourt websites with respect to development opportunities at Whitecourt Airport or contact information.

Servicing: While large tracts of land are available for development, infrastructure servicing is not available for the entirety of the Whitecourt Airport property. Further, the capacity of existing stormwater, sanitary sewer, and water servicing infrastructure will likely require future upgrades to facilitate larger-scale development.

Need for Additional Studies: Additional studies and investigation will be required to properly plan business parks and novel agriculture and industrial uses. Much critical information regarding business park locations, planning and strategy is currently in a study not yet released by Woodlands County. Novel agricultural and energy industrials would require additional checks against municipal and regional planning documents in force to determine compatibility with the airport industrial area.

In addition to the challenges above, the pricing of Whitecourt Airport leases must be considered. The price sensitivity of new tenants must be considered given the availability of competitive alternatives to Whitecourt Airport. A balance must be reached in that lot leases should contribute to the overall financial viability of the airport, but leases should not be prohibitively priced to discourage new desired development.

AIR SERVICE DEVELOPMENT

While considering Whitecourt Airport's air service development marketing goals, it is imperative to understand and address air service challenges including:

Post-COVID Airline Priorities: The COVID-19 pandemic will have a lasting impact on the development of air service. As the aviation industry recovers from pandemic disruptions, air carriers will focus on and prioritise rebuilding existing markets and routes where their air service is currently provided, rather than trying new markets. Further, the current downturn in the oil and gas markets are likely to suppress demand for regional air travel. Due to these two factors, it may be challenging to attract air service to Whitecourt Airport in the short- to medium-term. Initiatives to promote the introduction of scheduled air service should probably be held off until air travel demand returns to near pre-COVID levels, which may take three (3) to five (5) years.

Air Fare Pricing: The pricing of flights could limit travellers from choosing to fly out of Whitecourt. Airlines must price their tickets sufficiently high to realize minimum revenue, yield, and profit requirements, while providing prices that are low enough to remain competitive with other airlines and ensure that sufficient passenger volumes are achieved. The price sensitivity of the local market can be a barrier to prospective airlines, as both will expect Whitecourt flights to enrich their system-wide fares.

Leakage to Alternate Airports: Whitecourt Airport is approximately 210 kilometers and a two-hour drive from Edmonton International Airport. Given the relative short driving distance, it is difficult to overcome the inclination for the local community to drive to Edmonton, where a diversity of air service options and non-stop flight destinations is available.

Competing Routes and Airline Resources: Air carriers will deploy their assets to maximize the profitability of their route system. As the primary capital asset, airlines, must deploy their aircraft on routes where they maximize revenue. If a route underperforms to the point where redeployment to a different destination could improve overall performance, then airlines may terminate the under-performing destination. Travel demand to/from Whitecourt may not be sufficient to warrant an airline providing scheduled service.

Airport Infrastructure: As described in the 2014 Whitecourt Airport Master Plan, the capacity, passenger handling capabilities, and amenities of the Air Terminal Building may limit air service from commencing. The lack of holdroom seating capacity, for example, could preclude the commencement of service by a regional airline with a larger aircraft. The airfield infrastructure, such as the runways and taxiways, must also be sufficient to support the operating performance requirements of the prospective airline's fleet.

CATSA Requirements: A challenge in establishing scheduled air service at Whitecourt Airport is that the airport does not have Canadian Air Transport Security Authority (CATSA)

passenger and baggage screening services. Airlines would therefore not be able to operate directly into air terminals at destination airports, but rather would have to operate into private terminals at FBOs. In recent years, CATSA has been reluctant to extend services into new airports, and when they have done so, it has been the responsibility of the airport to cover CATSA's full operating costs.

10.4 MARKETING TECHNIQUES

10.4.1 COMMERCIAL DEVELOPMENT

To achieve the preliminary commercial development goals and objectives identified above, it is recommended appropriate commercial development marketing techniques be implemented. The techniques described below can be used to attract both new aviation and new non-aviation tenants.

Marketing brochure: A marketing brochure that contains preliminary information of interest to a new tenant can be prepared and distributed at industry events, via email, by the Whitecourt Airport website and by regional economic development offices. Information of interest may include airport strengths, amenities and benefit-oriented headlines; Whitecourt Airport and regional statistics; figures such as driving and flying distances to other airports or key destinations; and contact information to an appropriate marketing figure for the airport or County. An effective brochure is one that can stimulate interest and incentivize the individual to seek further information from the region.

Public Communication: Press releases or social media messages issued by the airport are a low-cost way to increase awareness about activities at Whitecourt Airport while managing messaging and establishing a greater online and community presence. Opportunities to publicly communicate about growth and development at the airport should be exploited. Key facts about the airport should be assembled and consistently included in public communications, supported by a repository of graphics and stock images of Whitecourt Airport. Examples of public communication opportunities include the opening of new businesses; the commencement or completion of infrastructure improvements, such as a new taxiway; and new partnerships. Establishing accounts on social media such as Facebook or Instagram would provide greater airport exposure and facilitate interaction with the public. Social media accounts can showcase the latest airport enhancements; virtually tour viewers around the airport; educate viewers on how airport systems work or on local history; answer questions from the public; or entertain with photography contests and aviation trivia. Examples of airports employing some of these tactics are Victoria International Airport

in British Columbia (@yyjairport), Grande Prairie Airport in Alberta (@gpairport), Saskatoon Airport in Saskatchewan (@skyxe.ca) and the Region of Waterloo International Airport in Ontario (@flyykf). Instagram posts featuring the airport may be arranged with accounts that have larger followings such as NAV Canada (@nav_canada) or COPA (@copanational) for greater exposure. If multiple accounts are established, the same handle should be used across all platforms (e.g. @whitecourtairport or @yzuairport) to maximize cross-posting opportunities between the different social media sites.

Promotion: Advertising involves targeted, proactive actions to attract new tenants to the Whitecourt Airport, such as printed advertisements in business and industry publications, billboards, and electronic advertisements on third-party websites. Opportunities for commercial development can also be promoted through speaking engagements, tradeshow participation, and conference sponsorship. Dedicated and targeted promotions will keep Whitecourt Airport in the front of mind for potential tenants. Whitecourt Airport should also have a greater presence within Woodlands County and Town of Whitecourt economic development and promotion documents as well as the airport website. An increased presence in these media will send the message that the airport is open to further economic development, new initiatives and airport investment.

An optimal airport website will have facility and amenity details, airport services information, land lease information (e.g. parcel sizes, servicing information, rates), clear and consistent branding, aesthetically-pleasing graphics and visual design, key contact information and links to social media channels. This information will be particularly important for attracting MRO and FBO tenants. Targeted promotion to the aviation community may be considered, for example by hosting fly-in events and connecting with the community through COPA. Whitecourt Airport has the advantage of being home to COPA Flight Number 185, a relationship that could be leveraged to increase exposure of the airport to general aviation pilots and enthusiasts. Increased aircraft movements and exposure may aid in the attraction of FBO and MRO services, which thrive at airports with high general aviation traffic.

Woodlands County may also consider releasing an expression of interest (EOI) with the incentive of discounted lease rates for a desired type of development, such as MRO or FBO developments to increase the chance to attracting such a tenant to the airport.

Finally, the airport may choose to undergo a rebranding exercise to refresh the airport's image, emphasize airport upgrades, and bring more exposure to the facility and its benefits to the local community and wider region. A rebranding exercise would also be a prime opportunity for a renovated airport website, new airport logo, and possibly a name change, for example from "Whitecourt Airport" to "Woodlands County Regional Airport". The airport could also consider selling the naming rights of the airport or terminal to a private entity such

as a resource industry. These strategies must be pursued strategically, for example with the re-establishment of fuelling services and paving of gravel areas, for maximum effectiveness.

Targeted Investment Attraction Program (TIAP): A TIAP identifies the types of businesses that typically locate and invest at airports. The TIAP should consider market trends and forces, as well as the preferred business types that align with the vision of Whitecourt Airport. The TIAP can be used to prioritize and focus tenant attraction efforts. The Whitecourt Economic Development Committee may provide valuable tools to undertake such an assessment and should be approached to help with such a program.

10.4.2 AIR SERVICE DEVELOPMENT

To achieve the preliminary commercial development goals and objectives identified above, it is recommended that appropriate air service development marketing techniques be implemented. Common techniques used by North American airports include:

Direct Marketing to Airlines: The development of an airport information package, often including a business case for new or expanded air services, is the most common tool for air service development. Direct presentations can be accomplished by arranging a meeting at an airline's headquarters or by participating in organized events for airports and airline route development such as the ACI Jump Start or Routes Americas conferences.

The key to the most successful air service development meeting with airlines is providing data such as local business travel demand or local tourism market needs. In particular, a travel demand study analyzing travel origins and destinations, as well as trip purpose, i.e. business versus leisure. The purchase of data, which may be tied to geographic information such as postal codes, area codes or catchment areas may be expensive. However, working with local partners such a businesses groups, tourism organizations, and educational institutes may be cost-effective methods to collect such information and deliver a business case. Air service development presentations can include the following content:

- Demographic data;
- Economic data;
- Development data (e.g. expansions, new businesses);
- Major employer data (e.g. travel needs);
- Tourism data (e.g. promotions and expected traffic);
- Community data;
- Origin and destination passenger data;

- Research on leakage to competing airports;
- Business travel data;
- Airport operating costs;
- Airport infrastructure;
- Market demand; and
- Business case.

Air Service Development Consultants: A consultant can be invaluable to Whitecourt Airport as they can provide air carrier information to the airport administration and often have additional tools to analyze local markets and match them with industry opportunities. These consultants have experience in delivering air service development presentations and have established relationships with airlines and other supporting parties.

Incentive Programs: Incentives for air service are more common in the United States than in Canada, but can be effective in attracting new services. Common incentive programs include revenue guarantees, direct subsidies, fee reductions or forgiveness, marketing assistance, and guaranteed ticket purchases. In-kind contributions by community groups or private-sector organizations offering billboards and local media coverage can also be implemented. These incentives programs do not guarantee the success of a service and airlines can cancel the service once the terms of the incentive have been met if flights are not viable.

10.5 NEXT STEPS

10.5.1 COMMERCIAL DEVELOPMENT

In support of the preliminary goals and objectives, the following next steps are recommended for the Woodlands County to further the overall success of commercial development at Whitecourt Airport:

- Initiate a review of Whitecourt Airport land lease rates, terms, and servicing fees to determine whether fee amendments are required to remain competitive with comparable regional facilities;
- Develop and communicate key messages regarding why businesses should choose to locate at Whitecourt Airport;
- Update and actively maintain the Whitecourt Airport website and establish a social media presence;

- Invest in value-added services that differentiate from other airports and employment centres within a specified driving distance;
- Identify one staff member responsible for airport commercial development and consistently communicate this information in all subsequent marketing materials. This will ensure that there is no ambiguity in who prospective tenants need to contact to receive development information;
- Implement an awareness campaign of Whitecourt Airport services and value to Woodland County and the region; create greater presence in Town of Whitecourt and Woodlands County economic development promotion initiatives and activities;
- Implement a customer service focused approach for the delivery of all Whitecourt Airport services;
- Provide strategic investment in airport and terminal building operational requirements as well as aesthetics;
- Consider preparing airside and groundside serviced lots to remain competitive with other airports and business parks. Certain investment and marketing agencies maintain a database of certified “shovel-ready” sites that are pre-serviced and zoned to facilitate efficient development. Identifying a similar database applicable to the Albertan or national context and listing Whitecourt Airport leaseholds could significantly improve the process of attracting tenants; and
- Further understand the Whitecourt Airport user market through active data collection.

10.5.2 AIR SERVICE DEVELOPMENT

In support of the preliminary goals and air service objectives, several strategies are provided. The following next steps can be implemented or further advanced in support of Whitecourt Airport air service development efforts:

- Invest in value-added amenities and services, and align airport infrastructure with the needs of desired air services. These actions will add value in supporting existing operations at Whitecourt Airport and can facilitate the attraction of new carriers;
- Undertake a travel demand study that identifies the number of annual trips originating or purchased in a geographic area such as area code (e.g. 780 and 587 numbers) or postal code, associated trip destinations and trip purpose information;
- Develop airport marketing materials to retain and attract new air service and a marketing plan that takes into account target audiences and the airport’s competitive advantages with specific, measurable and achievable goals for varying time frames.

An air service development brochure can be used on the Whitecourt Airport website and networking events to provide information to potential air service providers;

- Develop an airport communications plan, with provisions to enhance and actively maintain the Whitecourt Airport website and establish a social media presence;
- Appoint a lead for air service development who will be responsible for the advancement of the objectives and will be a single point of contact for partners and airlines. This lead will also maintain relationships with current airport tenants;
- Work with Sunwest Aviation and Central Mountain Air to identify current or future opportunities for increased air service;
- Maintain airport price competitiveness by analyzing and monitoring the market of similar regional airports regarding airport fees, available support services, and facilities that are required by airlines;
- Develop policies and guidelines for the attraction and retention of routes and airlines while considering investments in promoting air services, the engagement of local partners, the use of consultants, and incentives;
- Meet with potential regional airlines to promote air service opportunities at Whitecourt Airport; and
- Promote Whitecourt Airport to the local business community to increase corporate aviation traffic.

The Preliminary Marketing Strategy is intended to be a starting point for engagement efforts and the development of a full Whitecourt Airport Marketing Strategy. Marketing efforts are targeted at two key areas: commercial land development and air service development. Marketing resources can be directed at both areas according to County priorities and contextual factors. A range of marketing techniques have been identified and explained, each of which, will help the County achieve its goals for the respective focus area. Tables 10.1 and 10.2 identify the next steps for both marketing areas identified throughout this strategy.

Table 10.1: Summary of Next Steps Toward Achieving Commercial Development Goals

COMMERCIAL DEVELOPMENT	NEXT STEPS
Short Term (1 to 5 Years)	➢ Review land lease rates and terms; ➢ Develop key messaging points to prospective tenants; ➢ Enhance and maintain Whitecourt Airport website and establish social media presence; ➢ Review land lease rates and terms; ➢ Develop key messaging points to prospective tenants; ➢ Enhance and maintain Whitecourt Airport website and establish social media presence; ➢ Identify one staff member as the key commercial development point of contact; ➢ Implement an awareness campaign about the airport's value and services; ➢ Implement a customer service approach for airport service provision; and ➢ Initiate active data collection to better understand airport user needs.
Medium Term (6 to 10 Years)	➢ Invest in value-added services and amenities at the airport; ➢ Strategically invest in airport and terminal building upgrades; and ➢ Prepare airside and groundside serviced lots for prospective tenants.
Long Term (11+ Years)	➢ Prepare airside and groundside serviced lots for prospective tenants.

Table 10.2: Summary of Next Steps Toward Achieving Air Service Development Goals

AIR SERVICE DEVELOPMENT	NEXT STEPS
Short Term (1 to 5 Years)	➢ Develop airport marketing materials and full marketing plan; ➢ Develop an airport communications plan; ➢ Identify one staff member as the key air service development point of contact; and ➢ Promote airport to local business community.
Medium Term (6 to 10 Years)	➢ Undertake travel demand study (Post-COVID); ➢ Identify potential opportunities with Sunwest Aviation and Central Mountain Air; and ➢ Invest in value-added services and amenities at the airport.
Long Term (11+ Years)	➢ Meet with potential regional airlines.

BIBLIOGRAPHY

- Butcher, G. A. (1992, August 25). Ambient Water Quality Objectives for the Lower Columbia River: Hugh Keenleyside Dam to Birchbank. Retrieved December 4, 2013, from Environmental Protection Division: http://www.env.gov.bc.ca/wat/wq/objectives/birchbank/birchbank.html
- Columbia Basin Trust. (2012, September). Climate Change, Impacts and Adaptation in the Canadian Columbia Basin: From Dialogue to Action. British Columbia, Canada.
- Holms, G. B., Pommen, L. W., & Cf, P. (1999, September). State of Water Quality of Columbia River at Birchbank. Retrieved December 4, 2013, from State of Water Quality of Columbia River at Birchbank: http://www.env.gov.bc.ca/wat/wq/quality/birchbank/index.htm
- Ministry of Forests. (1996). Community Watershed Guidebook. Retrieved December 4, 2013, from Community Watershed Guidebook: http://www.for.gov.bc.ca/TASB/LEGSREGS/FPC/FPCGUIDE/WATRSHED/Watertoc.htm
- National Academies of Sciences, Engineering, and Medicine. (2010). Marketing Guidebook for Small Airports. Washington, DC: The National Academies Press. https://doi.org/10.17226/14353.

APPENDIX

A WHITECOURT AIRPORT SWM PLAN TECHNICAL MEMO

Memorandum

To	Andre Bachand, Director, Infrastructure Services, Woodlands County
From	Mikaela Hanley, P.Eng, Municipal Engineering, WSP
Office	WSP, Edmonton, Alberta
Date	April 24, 2020
Revision	Technical Memo
File	20M-00071-00
Subject	Review of Whitecourt Airport Proposed Drainage Plan.

This memo has been prepared by WSP for Woodlands County regarding the Whitecourt Airport (CYZU). The intent of this memo is to investigate the current storm water drainage system based on the topographic survey and proposed Whitecourt Airport Conceptual Airport Development Stormwater Management (SWM) Plan by Pasquini and Associates Consulting Ltd. (Pasquini SWM Report), and to provide any alternatives for improvements of drainage system for future developments of Whitecourt Airport.

Project Background

In 2013, the Airport Master Plan was provided to Whitecourt Airport for future development by Air Biz. The Airport Master Plan included the appropriate development options to ensure the Airport meets its strategic objects and to accommodate expected levels of traffic over the next 20 years.

Analysis

At the request of Woodland County, WSP investigated the current storm water drainage system based on the topographic survey data provided by the County and information within Whitecourt Airport Conceptual Airport Development Stormwater Management Plan (SWM) previously completed by Pasquini & Associated Consulting Ltd. (see attached).

As mentioned in Pasquini SWM Report, future storm drainage infrastructure will be required to convey any on-site drainage to stormwater management facilities, which typically consist of wet ponds or dry ponds. Stormwater management facilities will be required to provide adequate flood protection by storing runoff, providing erosion control and controlling off-site discharge to an acceptable rate. If a stormwater management facility consists of a wet pond or a dry pond with a forebay, it will be required to facilitate minimum 85% removal of total suspended solids (TSS), therefore improving the water quality of discharge prior to release into the downstream stormwater conveyance system. A SWM plan also proposes major and minor system for on-site stormwater management. The minor system consisting of storm sewer pipes, which provides a basic level of service, conveying runoff from low intensity from more frequent rainfall events; where the major system comprises of ditch, swales and local ponding areas which convey and store runoff when minor system exceeds the capacity during the high intensity from less frequent rainfall event. The proposed stormwater management plan will require an approval from appropriate authorities and should adhere to the following design guidelines:

- Part 5 of Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems (March 2013)
- Stormwater Management Guidelines for the Province of Alberta (January 1999).

Based on the topographical information provided by the County, WSP reviewed the data to get a general understanding of the existing drainage flow path of the airport and surrounding landmarks. WSP was also able to gather rainfall Intensity-Duration-Frequency (IDF) data of 29 years (1982 -2012) for the Whitecourt Area (see attached IDF data) to calculate peak flow and runoff volumes for each catchment area mentioned in Pasquini SWM Report.

The proposed development consists of Terminal Reserve, Airside Commercial, Light Industrial, Highway Commercial and Operational Reserve. To determine approximate peak runoff values and total 24-hour runoff volumes, assumed runoff coefficients and percent imperviousness were allocated to each land-use type.

WSP reviewed the suggested drainage boundaries and subcatchments areas as indicated in the Figure ST-1 from the Pasquini SWM Report. The concept stormwater management plan and specific findings of each subcatchments is highlighted below.

Undeveloped Subcatchments

Subcatchment areas which are not planned to be future developed are generally located north, northwest and southeast of the runway and will maintain the natural drainage patters towards the off-site landmarks of the airport boundary.

Subcatchment #1

This catchment is approximately 42.23 ha, with a general high elevation determined from Lidar of 781.70m and a low spot of 762.70m. The catchment is about 5% impervious (runway) and 95% pervious (grasslands). Drainage from runway is directed into ditch along the northeast side, which drains from northwest of catchment towards the low point on southeast of the catchment at an approximate grade of 0.7% over 880m. The ditch bottom also has two culverts (10m and 12m) installed along the way. General grading of the catchment ranges from 0.1 – 1.4%, where it eventually drains to low point at the southeast corner of the airport boundary. The longest runoff path of the catchment is approximately 1450m. Some areas within the catchment may be considered for re-grading to ensure positive drainage towards the southeast corner, since these areas can be relatively flat with as low as 0.1% drainage slope.

As mentioned in the Pasquini SWM Report, the only developed area will be in southeast corner of this catchment, which will have a major stormwater management facility to store upstream flow from catchment #'s 2,3,11,12 and 13, prior to discharging the flow off-site.

As mentioned in Airport Master Plan, no future development is anticipated for this catchment as it is to remain as open space/recreational area. Total expected peak flow through this catchment would be approximately 8.0 m^3/s, with this catchment expecting to generate 33,000m^3 of runoff (including upstream catchment #'s 2,3,11,12 and 13) during a 24 hour, 1 in 100-year storm event.

Note: Subcatchment #'s 11, 12 and 13 are proposed developed areas.

Subcatchment #2

This catchment is approximately 2.70 ha, with a general high elevation determined from Lidar of 781.1m, and a low spot of 778.0m. The catchment is about 30% impervious (runway), and 70% pervious (grasslands). Runoff from this catchment is collected within a central ditch, which drains from the northwest to the northeast at an approximate grade of 0.5% over 200m. Southwest and Northeast of the drainage ditch has a drainage slope of less than 0.5%, where re-graded is recommended to ensure adequate flow downstream. General grading of the catchment towards the drainage ditch ranges from 0.3 – 2.5%.

As mentioned in the Pasquini SWM Plan, there is no known culvert under the existing taxiway draining this catchment downstream towards catchment #1. This is recommended to ensure the proper conveyance of storm runoff downstream, avoiding ponding in the low area of catchment.

As mentioned in Airport Master Plan, no future development is anticipated for this catchment. Total expected peak flow through this catchment would be approximately 1.1 m^3/s during the 1 in 100-year storm event.

Subcatchment #3

This catchment is approximately 5.63 ha, with a general high elevation determined from Lidar of 782.9m, and a low spot of 778.7m. The catchment is about 25% impervious (runway), and 75% pervious (grasslands). Runoff from this catchment is collected within a central ditch, which drains from the northwest to the southeast at a grade less than 0.5% over 400m. It is recommended that the drainage ditch should be re-graded to have a drainage grade of greater than or equal to 0.5% to allow adequate flow to the low area of the catchment. General grading of the catchment towards the drainage ditch ranges from 0.3 – 2.5%.

As mentioned in the Pasquini SWM Plan, there is no known culvert under the existing taxiway draining this catchment downstream towards catchment #2. This is recommended to ensure the proper conveyance of storm runoff downstream, avoiding ponding in the low area of catchment.

As mentioned in Airport Master Plan, no future development of hard surfaces is anticipated for this catchment. Total expected peak flow of this catchment would be approximately 0.7 m^3/s during the 1 in 100-year storm event.

Subcatchment #4 and #5

These catchments have an approximate area of 3.67ha and 4.75ha respectively. These catchments are located on the northeast side of the runway and are 100% pervious (grasslands) area. The runoff from these catchments drains into offsite low area, which would eventually follow drainage patterns through the offsite landmarks to the east.

As mentioned in Airport Master Plan, no future development is anticipated for these catchments as it is to remain as open space/recreational area. Total expected peak flow through these catchments would be approximately 0.3 m^3/s for catchment 4, and 0.4 m^3/s for catchment 5 during 1 in 100-year storm event.

Subcatchment #6

This catchment is approximately 15.14 ha, with a general high elevation determined from Lidar of 782.7m and a low spot of 773.1m. The catchment is about 10% impervious (runway) and 90% pervious (grasslands). Drainage from runway is directed into ditch along the northeast side, which drains from southeast of catchment towards the low point on northwest of the catchment at an approximate grade range of 0.4 – 4.6% over 1220m. The ditch bottom also has two culverts (10m and 12m) installed along the way. General grading of the catchment ranges from 0.5 – 3%, where it eventually drains to low point at the northwest corner of the airport boundary.

As mentioned in Airport Master Plan, no future development is anticipated for this catchment as it is to remain as open space/recreational area. Total expected peak flow through this catchment would be approximately 1.5 m^3/s during 1 in 100-year storm event.

Subcatchment #7

This catchment is approximately 16.63 ha, with a general high elevation determined from Lidar of 783.0m, and a low spot of 776.8m. The catchment is about 10% impervious (runway), and 90% pervious (grasslands). Runoff from this catchment is collected within a central ditch, which drains from the southeast to the northwest towards existing 900mm dia. culvert at a grade of 0.6% over 1050m, which eventually drains in to subcatchment #8. A portion of ditch does have grade less than 0.5% and it is recommended that the drainage ditch should be re-graded to have a drainage grade of greater than or equal to 0.5% to allow adequate flow to the low area of the catchment. General grading of the catchment towards the drainage ditch ranges from 0.5 – 2.6%.

As mentioned in Airport Master Plan, no future development is anticipated for this catchment as it is to remain in existing condition. Total expected peak flow through this catchment would be approximately 1.6 m^3/s during 1 in 100-year storm event.

Subcatchment #8

This catchment is approximately 5.53 ha, with a general high elevation determined from Lidar of 782.3m, and a low spot of 773.6m. The catchment is about 10% impervious (runway), and 90% pervious (grasslands). Runoff from this catchment is collected within a central ditch, which drains from the southeast to the northwest at a grade of 1.8% over 400m. A portion of ditch does have grade less than 0.5%, which is concern for pooling in the area and it is recommended that the drainage ditch should be re-graded to ensure positive drainage towards the low area of the catchment. General grading of the catchment towards the drainage ditch ranges from 1.5 – 17.0%.

As mentioned in Airport Master Plan, no future development is anticipated for this catchment as it is to remain in existing condition. Total expected peak flow through this catchment would be approximately 2.2 m^3/s during 1 in 100-year storm event.

Subcatchment #9

This catchment has an approximate area of 3.43 ha, with a general high elevation determined from Lidar of 780.9m, and a low spot of 773.2m. This catchment is 100% pervious (grasslands) area. Runoff from this catchment drains from southeast to the northwest, which eventually drains into low area at the north end of the catchment and follows off-site drainage path to the north. General grading of the catchment towards the drainage ditch ranges from 0.1 – 5.4%.

As mentioned in Airport Master Plan, no future development is anticipated for these catchments as it is to remain in existing condition. Total expected peak flow through this catchment would be approximately 0.3 m^3/s during the 1 in 100-year storm event.

Subcatchment #10

This catchment has an approximate area of 11.58 ha, with a general high elevation determined from Lidar of 780.2m, and a low spot of 766.0m. This catchment is 100% pervious (grasslands) area. Runoff from this catchment drains from south to the north, which eventually drains into low area at the north end of the catchment and follows off-site drainage path to the north. General grading of the catchment towards the drainage ditch ranges from 0.6 – 2.9%.

As mentioned in the Pasquini SWM Report and Airport Master Plan, the only developed area will be in northwest corner of this catchment, which will have a major stormwater management facility to store upstream flow from catchment 16, prior to discharging the flow off-site.

As mentioned in Airport Master Plan, no future development is anticipated for these catchments as it is to remain in existing condition. Total expected peak flow through this catchment would be approximately 3.1 m^3/s with this catchment expecting to generate 13,000 m^3 of runoff (including upstream catchment 16) during the 24 hour, 1 in 100-year storm event.

Note: Subcatchment # 16 is proposed developed area.

Developed / Developing Subcatchments

Subcatchment areas which are understood to be developed in the future are generally located west and southwest of the runway. As mentioned in the Pasquini SWM Report, proposed drainage to remain as closey as possible to existing pattern with proposed stormwater management facilities as shown on Figure ST-1.

Subcatchment #11

This catchment comprises an existing tenant facility for operations by Alberta Forestry Tanker Base with approximately area of 7.06 ha, with a general high elevation determined from Lidar of 782.6m, and a low spot of 769.9m. The catchment is about 15% impervious (site and taxiway), and 85% pervious (grasslands). A portion of runoff from this catchment is directed into a collection pond located adjacent to the airport taxiway. Runoff from the collection pond is discharged thru culvert into the ditch at grade of 1.2% into subcatchment #1 on the east side. General grading of the catchment ranges from 0.04 – 1.5%. It is recommended that northwest corner to be re-graded to ensure positive drainage towards the northeast corner. Drainage from the existing access roadway along the southwest boundary on the catchment is flowing into the roadside ditch, which drains downstream towards south of Airport boundary.

As mentioned in the Pasquini SWM Report, the facility within this catchment is only operational during the spring, summer and fall and it is unlikely that any de-icing would take place. But if any de-icing the aircraft were to take place to adjacent apron, the chemicals associated with the operation may end up in the catchment and future development should consider a designated location for de-icing with appropriate collection point for chemical runoffs. The use of control gates, sumps and pumpout locations can allow operators to close off stormwater flow if necessary, and capture contaminants locally for proper handling or treatment.

Also mentioned in Pasquini SWM Report, since the discharge from this catchment will increase the runoff in the subcatchment #1, there may be an opportunity to develop future stormwater management facility in subcatchment #1 to control and treat additional discharge prior to release off-site of the airport boundary.

As mentioned in Airport Master Plan, the future development is anticipated for this catchment with approximately 70% impervious (airside commercial) area. Total expected peak flow through this catchment would be approximately 1.4 m^3/s, during the 1 in 100-year storm event.

Subcatchment #12

This catchment comprises a Woodlands County Operational Reserve with an approximate area of 2.35 ha, with a general high elevation determined from Lidar of 778.7m, and a low spot of 774.7m. The catchment is about 15% impervious (tenant site), and 85% pervious (grasslands). Runoff from this catchment is collected into the ditch at grade of 2.2% over 200m, located on the east side of the catchment, which drains north into subcatchment #1. General grading of the catchment ranges from 0.2 – 1.9%. Drainage from the existing access roadway along the southwest boundary on the catchment is flowing into the roadside ditch, which drains downstream towards south of Airport boundary.

As mentioned in the Pasquini SWM Report, since the discharge from this catchment will increase the runoff in the subcatchment #1, there may be an opportunity to develop a future stormwater management facility in subcatchment #1 to control and treat additional discharge prior to release off-site.

As mentioned in Airport Master Plan, the future development anticipated for this catchment is Operational Reserve, which has been estimated to have 50% impervious area. Total expected peak flow through this catchment would be approximately 0.4 m^3/s, during the 1 in 100-year storm event.

Subcatchment #13

This catchment has an approximate area of 6.72 ha, with a general high elevation determined from Lidar of 776.7m, and a low spot of 771.4m. This catchment is 100% pervious (woodland) area. Runoff from this catchment is directed into northeast, which drains north into subcatchment #1. General grading of the catchment ranges from 0.3 – 2.2%. Drainage from the existing access roadway along the southwest boundary on the catchment is flowing into the roadside ditch, which drains downstream towards the southside of the Airport boundary.

As mentioned in the Pasquini SWM Report, since the discharge from this catchment will increase the runoff into the subcatchment #1, there may be an opportunity to develop a future stormwater management facility in subcatchment #1 to control and treat additional discharge prior to release off-site. Stormwater facility can also be sized to service off-site drainage from subcatchments #11 and #12.

As mentioned in Airport Master Plan, the future development is anticipated as Highway Commercial for this catchment which is estimated to have 80% impervious area. Total expected peak flow runoff through this catchment would be approximately 1.4 m^3/s, during the 1 in 100-year storm event.

Subcatchment #14

This catchment comprises airport terminal, tenant facilities, airside commercial and other operational facilities with approximately 47.41ha. The catchment is about 35% impervious (tenant site), and 65% pervious (grasslands). Runoff from this catchment is directed in a south direction. The existing major storm system placed in this catchment has ditches and culverts, where the currently developed northeast portion of the catchment drains into the existing roadside ditch, which currently flows to downstream subcatchments # 11, 12 and 13, which eventually flows offsite. The southwest portion of the catchment consist of small woodland area, where the runoff is directed towards the south portion of the catchment which will drain into offsite existing drainage flow path. This catchment has multiple small areas in the catchment where drainage slopes are below standards and no flow is being directed, which causes pooling the areas. It is recommended that those areas to be re-graded to ensure positive drainage towards the southern edge, since the areas are relatively flat. Drainage from the existing access roadway along the southwest boundary on the catchment is flowing into the roadside ditch, which drains downstream towards the southside of the Airport boundary.

As mentioned in the Pasquini SWM Report, since the size of this catchment is quite large, a stormwater management facility should be developed on south side of this catchment to collect and control all runoff prior to discharging off-site or conveyed by a minor stormwater system into the downstream subcatchment #1.

As mentioned in Airport Master Plan, the future development is anticipated for this catchment with approximately 90% impervious (terminal service, airside commercial and light industrial) area. Total expected peak flow runoff through this catchment would be approximately 10.8 m^3/s, with this catchment expecting to generate 43,000 m^3 of runoff during the 24 hour, 1 in 100-year storm event.

Subcatchment #15

This catchment is approximately 30.35 ha, with a general high elevation determined from Lidar of 781.7m, and a low spot of 777.8m. This catchment is 100% pervious (woodland) area. Runoff from this catchment is directed into south/southwest direction towards low point, which drains off-site of airport boundary. Since this catchment consists of large woodland area, it is difficult to determine the exact drainage path of the catchment. Drainage from the existing access roadway along the west boundary of the catchment is flowing into the roadside ditch, which drains southward.

As mentioned in the Pasquini SWM Report, the discharge from this catchment should be directed towards the south of the catchment into a storm water facility prior to off-site discharge into road right-of-way. The Stormwater Management facility is proposed for the south end of the subcatchment adjacent to airport boundary.

As mentioned in Airport Master Plan, the future development is anticipated for this catchment with approximately 70% impervious (airside commercial and light industrial) area. Total expected peak flow runoff through this catchment would be approximately 5.9 m^3/s, with this catchment expecting to generate 25,000 m^3 of runoff during the 24 hour, 1 in 100-year storm event.

Subcatchment #16

This catchment is approximately 9.97 ha, with a general high elevation determined from Lidar of 781.7m, and a low spot of 779.7m. This catchment is 100% pervious (woodland) area. Runoff from this catchment is directed north towards low point, which drains into subcatchment #10. General grading of the catchment ranges from 0.2 – 2.1%. Since this catchment consists of large woodland area, it is difficult to determine the exact drainage path of the catchment. Drainage from the existing access roadway along the west boundary on the catchment is flowing into the roadside ditch.

As mentioned in the Pasquini SWM Report, since the discharge from this catchment will increase the runoff in the subcatchment #10, there may be an opportunity to develop future stormwater management facility in subcatchment #10 to control discharge prior to release off-site of the airport boundary.

As mentioned in Airport Master Plan, the future development is anticipated for this catchment with approximately 80% impervious (airside commercial) area. Total expected peak flow of this catchment would be approximately 2.1 m^3/s, during the 1 in 100-year storm event.

General Recommendations

Lot & Ditch Grading

After analysing all the catchments, we recommended that all the undeveloped catchments, which are to remain undeveloped, require re-grading in parts of the catchments where grade slopes are less than 0.1% and ditches less than 0.5% to ensure a positive and adequate drainage through property.

Developed lots should have site grading of 1-2% minimum, with minimum ditch slopes of 0.5% (1% where possible).

We propose to clean out and widen existing ditches throughout the current airport development to ensure adequate drainage, as well as to ease the challenge of maintaining the ditches.

Culverts

With major flows being conveyed in the proposed ditches, we recommend that culverts are sized to handle the 1:100 year peak flows, otherwise roads and entrances are at risk of being washed out during larger storm events. Detailed modelling of the expected flow paths and runoff, as well as a good understanding of the ditch storage capacities can be undertaken during detailed design to accurately size the culverts.

Stormwater Management Facilities

We recommend that for any future developments, a stormwater management facility should be put in place to control all the storm drainage on site prior to discharging off-site to its natural drainage path. As mentioned in Figure ST-1 in Pasquini SWM Report, catchments #1, 10, 14 and 15 have upstream contribution of the storm runoff which generates approximately 33,000 m^3, 13,000 m^3, 43,000 m^3 and 25,000 m^3 respectively. These developing catchments should incorporate on-site stormwater storage where practical to temporarily detain runoff from upstream catchments prior to off-site release; this could reduce the road culvert sizes downstream, as well as reduce the size of the larger stormwater management facilities. To obtain appropriate sizing of stormwater facilities (i.e. storage pond), detailed modelling of the developed catchments and there allowable release rates is required for critical storm events.

Wildlife / Water Bodies

The stormwater management facilities may contain permanent water bodies, which will attract wildlife and other species. Considering proximity to the air traffic, measures for wildlife and bird control should be explored during detailed design. Some techniques that are recommended to reduce wildlife attraction are:

- Dry Ponds for Runoff Storage (no permanent water body)
- Effective ditching and lot grading (reduce standing water)
- Rip-Rap and Steep Slopes on Wet ponds (Reduce wildlife habitats)
- Physical Deterrents, i.e. noise makers or wires (prevents birds from landing)

Contaminants

As mentioned above in Catchment #11, it is recommended that during detailed design techniques are explored to reduce the risk of de-icing contaminants entering the downstream water bodies. The use of gates, sumps, and pumpout locations can be implemented where necessary to help capture contaminated runoff.

Order of Magnitude Estimations

The development of the airport property will require various stormwater infrastructure. Moving forward, expected drainage costs and allowances associated with this development could be as follows:

- 4x Stormwater Management Facilities w/ Control Manholes $4,500,000
- New roadway and entrance culverts, and some storm piping $1,000,000
- Allowance for existing lot / ditch drainage improvements $100,000
- Allowance for Treatment and containment of Contaminated Runoff $1,000,000

Closure

We trust the information provided will assist in the further development of this airport. Should any questions arise, please contact us at your convenience.

Prepared by Dhruv Patel, E.I.T.
Engineer-In-Training, Municipal Engineering.

Reviewed by Eric Seinen, P.Eng.
Project Engineer, Municipal Engineering.

Approved by Mikaela Hanley, P.Eng.
Project Manager, Municipal Engineering.

Attachments:

- Whitecourt Airport Master Plan, Storm Water Management Plan
- Pasquini & Associates Consulting Ltd. – Whitecourt Airport Conceptual Airport Development and Stormwater Management Plan
- Environment Canada Short Duration Rainfall Intensity-Duration-Frequency Data (March 27, 2020)

WHITECOURT AIRPORT

MASTER PLAN

Airport Advisory Committee Update

April 4 2013

AGENDA

1. Overview of Stakeholder Engagement
2. Airport Master Plan: Development Concept
    - Development Concept Plan
    - Terminal Reserve Lands / New Terminal Conceptual Plan
    - Highway Commercial Lands
3. Project Schedule
4. Next Steps
    - Further discussions with key Stakeholders
        - NavCanada and others
    - Draft Airport Master Plan
    - Topographical / Facilities Survey / Engineering Studies

AIRPORT MASTER PLAN

1. OVERVIEW OF STAKEHOLDER ENGAGEMENT

1. OVERVIEW OF STAKEHOLDER ENGAGEMENT

- "Survey Monkey":
  - Reached out to 32 groups / individuals
  - 14 responses
- Telephone surveys and face to face meetings:
  - Sunwest Aviation
  - Millar Western
  - Airborne / Nabors
  - Air Spray
  - Shell Canada
  - Central Mountain Air
  - STARS
  - SRD
  - Conair
  - North Caribou
  - Integra Air
  - NavCanada
  - Town of Whitecourt

1. OVERVIEW OF STAKEHOLDER ENGAGEMENT

WILDFIRE TODAY

Home Documents Contact Us FAQ Links Author Advertise

Posted on October 2, 2012 by Bill Gabbert

← Previous Next →

Air Spray moves into California, will convert BAe-146 into air tanker

— Air Spray's BAe-146. Credit Air Spray

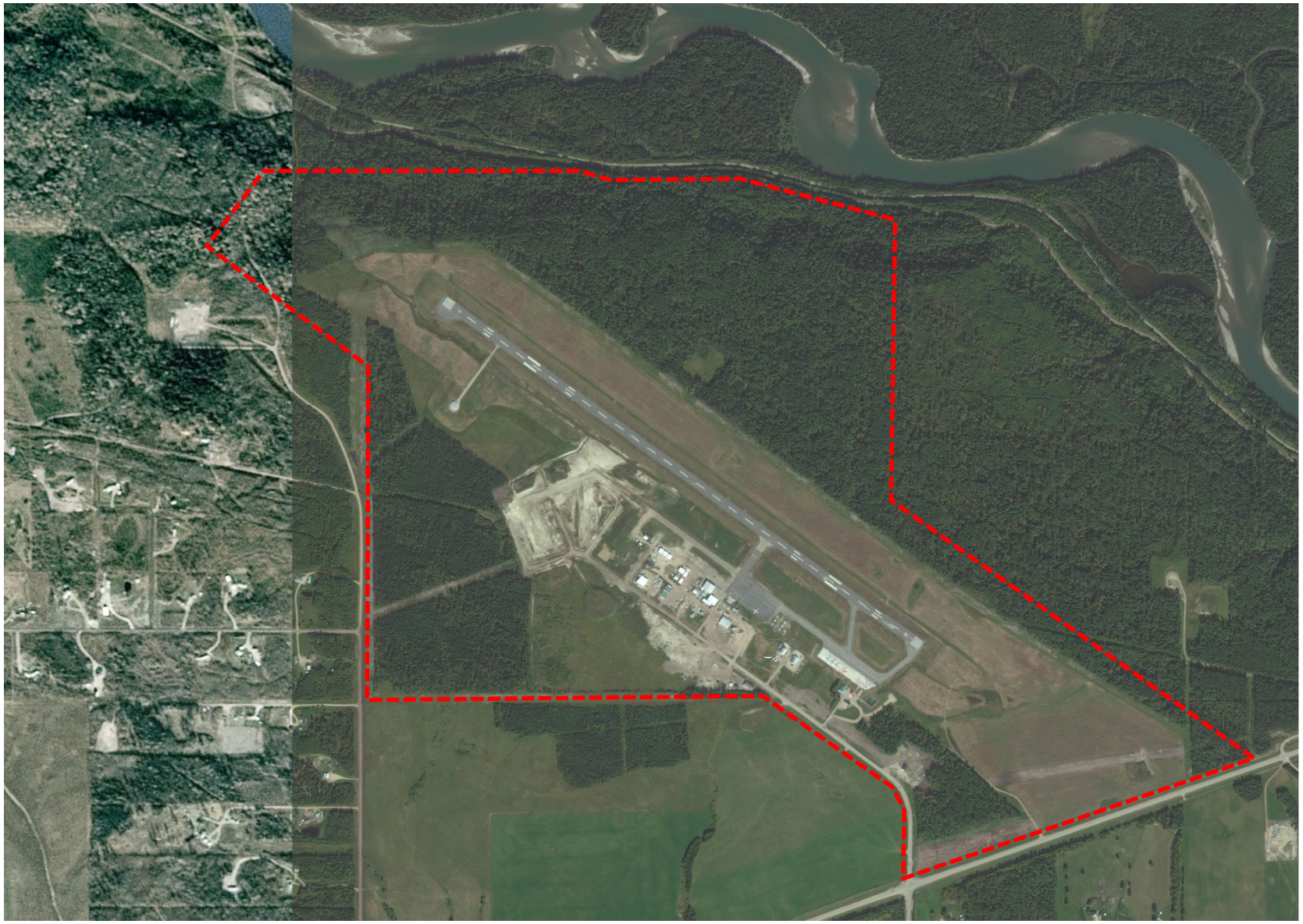
Air Spray Aviation Services, which operates Lockheed L-188 Electra "Longliner" air tankers and Turbo Commander 690 "Bird Dog" aircraft in Canada, has established a new United States headquarters at Chico, California. They announced yesterday that they have acquired a BAe-146 airliner which they will convert into an air tanker.

AIRPORT MASTER PLAN

2. AIRPORT DEVELOPMENT CONCEPT

WHITECOURT AIRPORT MASTER PLAN

EXISTING AIRPORT BOUNDARY

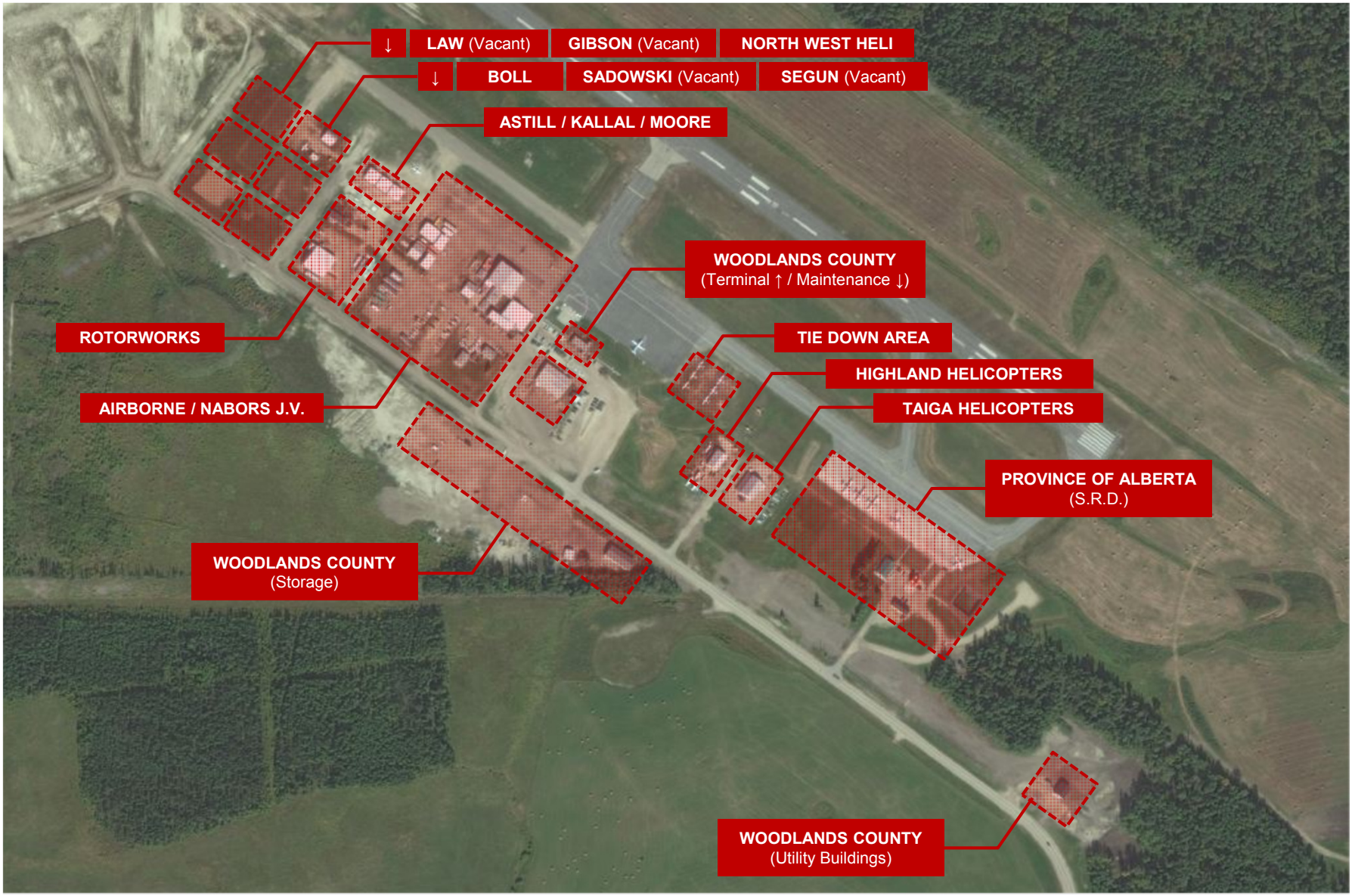


Legend

Airport boundary

WHITECOURT AIRPORT MASTER PLAN

EXISTING TENANTS / OWNERS

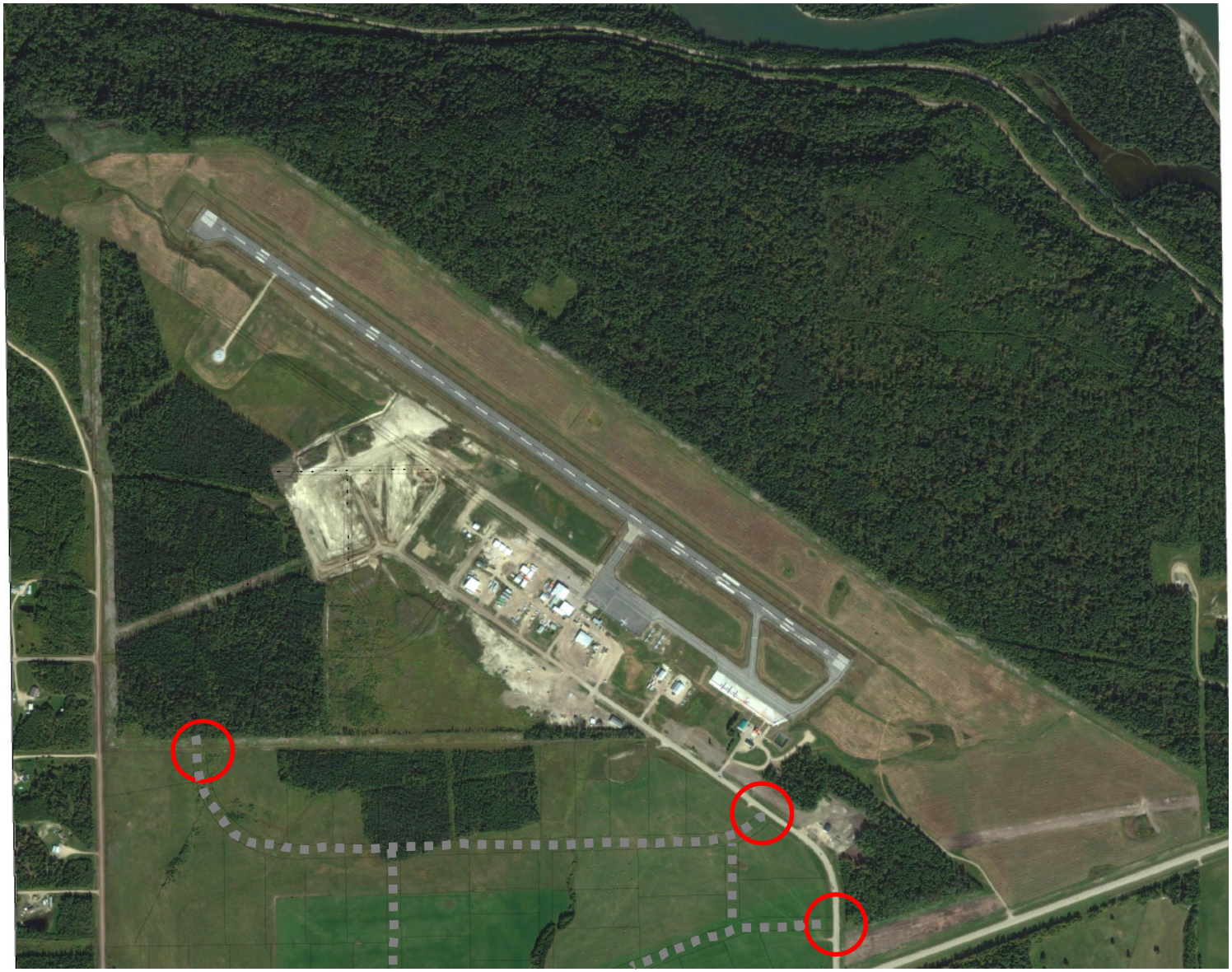


CONCEPTUAL AIRPORT DEVELOPMENT PLAN

DEVELOPMENT CONCEPT

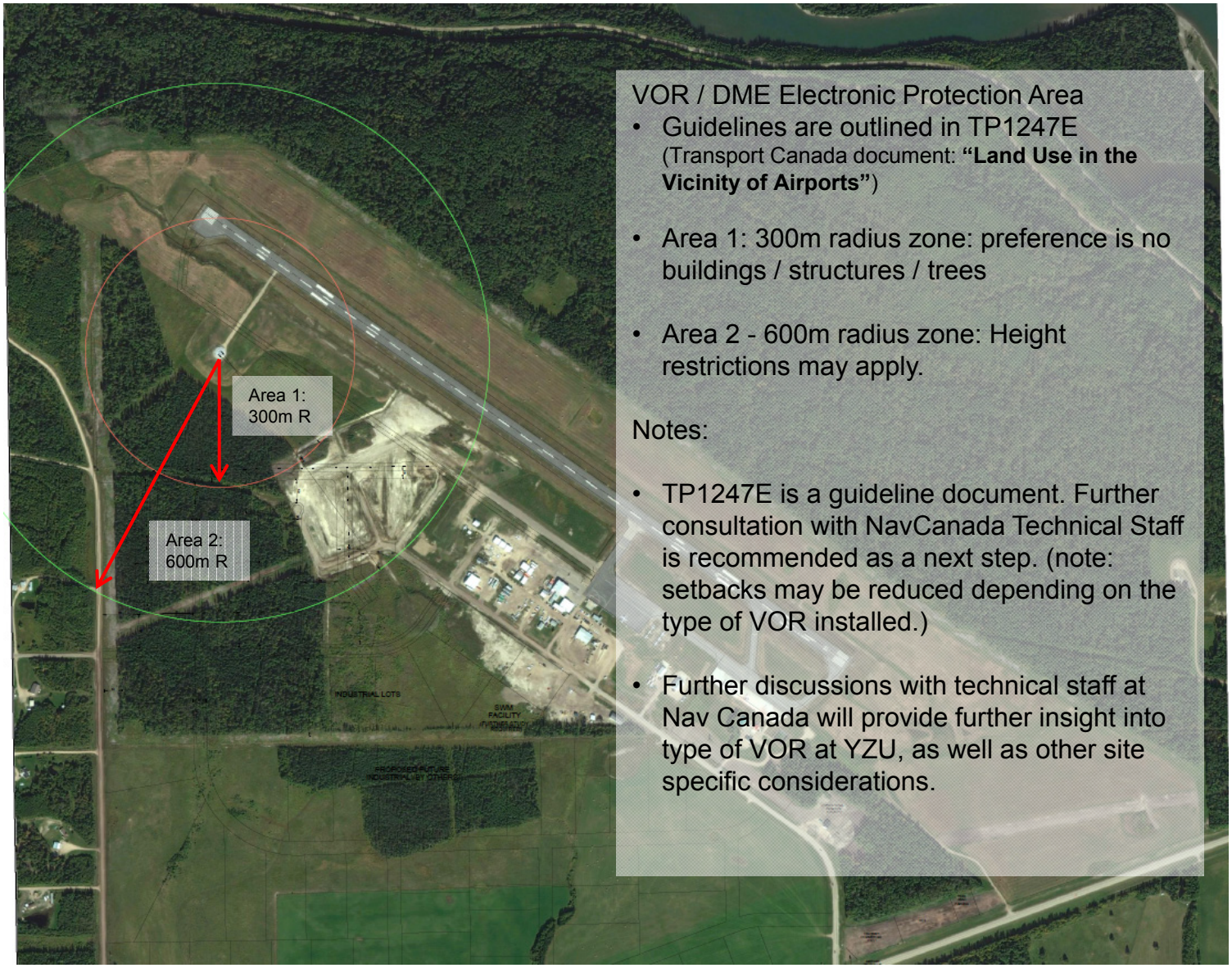
CONCEPTUAL AIRPORT DEVELOPMENT PLAN

DEVELOPMENT CONCEPT



CONCEPTUAL AIRPORT DEVELOPMENT PLAN

DEVELOPMENT CONCEPT



VOR / DME Electronic Protection Area

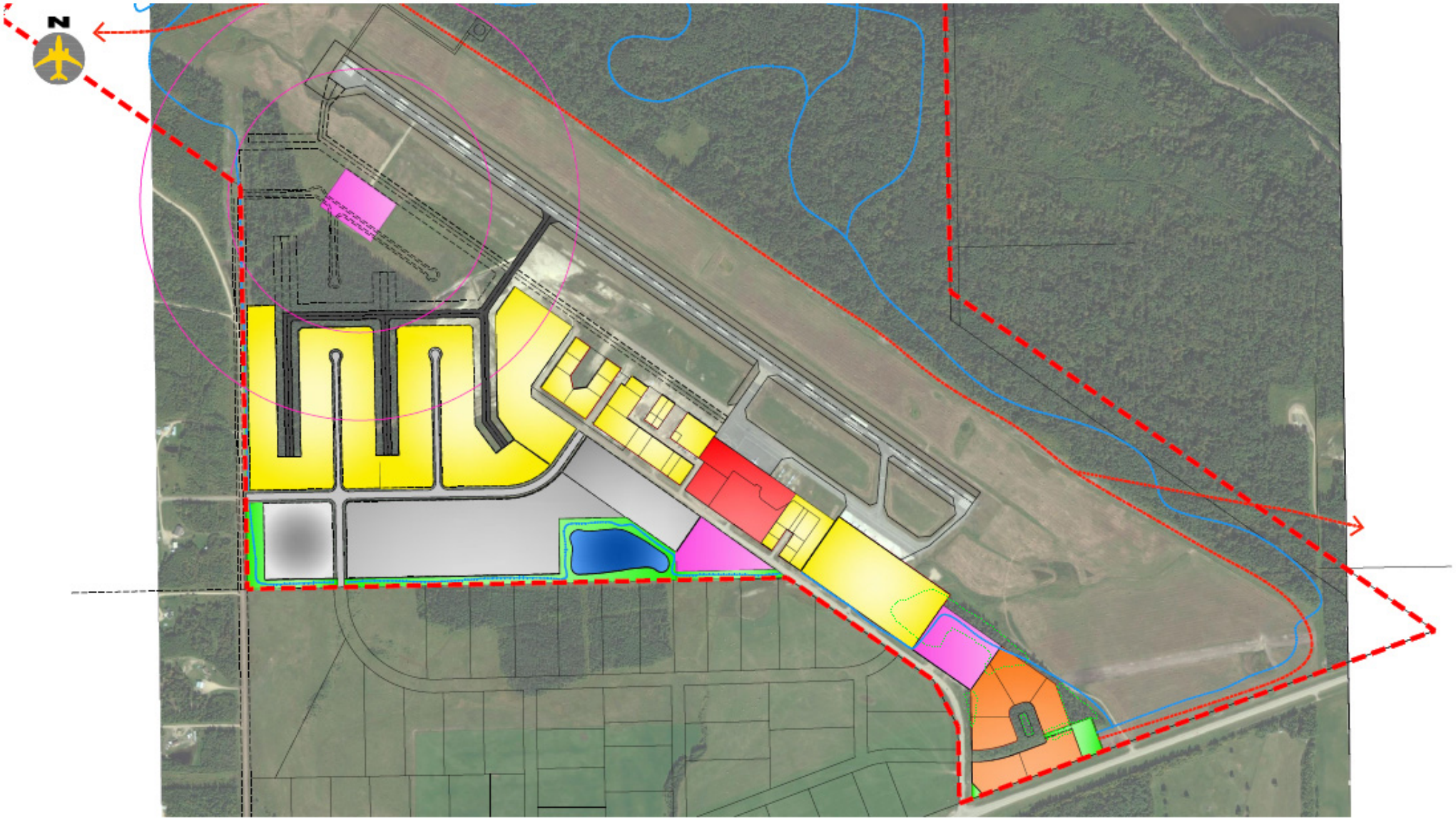
- Guidelines are outlined in TP1247E (Transport Canada document: **"Land Use in the Vicinity of Airports"**)
- Area 1: 300m radius zone: preference is no buildings / structures / trees
- Area 2 - 600m radius zone: Height restrictions may apply.

Notes:

- TP1247E is a guideline document. Further consultation with NavCanada Technical Staff is recommended as a next step. (note: setbacks may be reduced depending on the type of VOR installed.)
- Further discussions with technical staff at Nav Canada will provide further insight into type of VOR at YZU, as well as other site specific considerations.

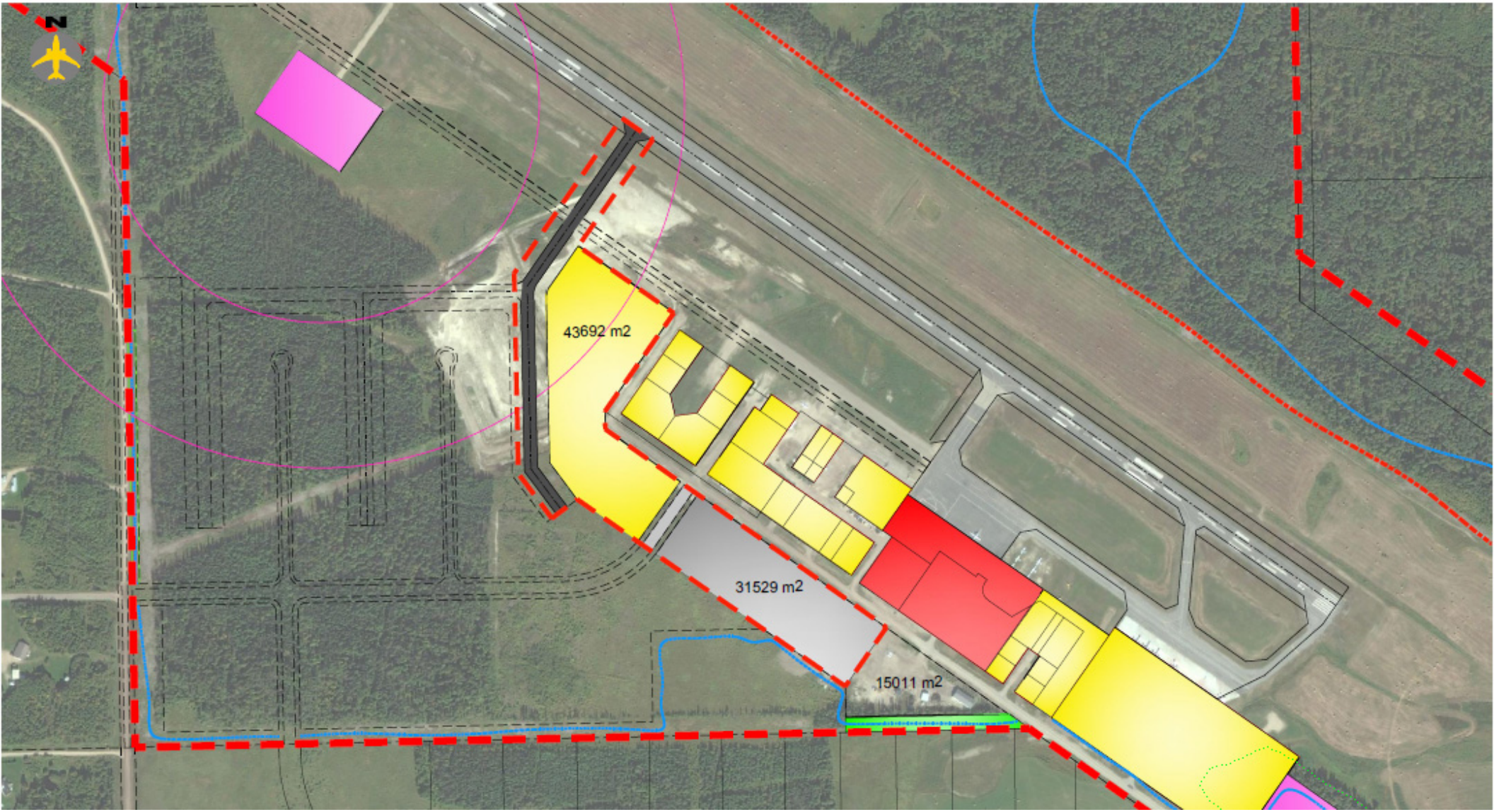
CONCEPTUAL AIRPORT DEVELOPMENT PLAN

OVERALL DEVELOPMENT CONCEPT



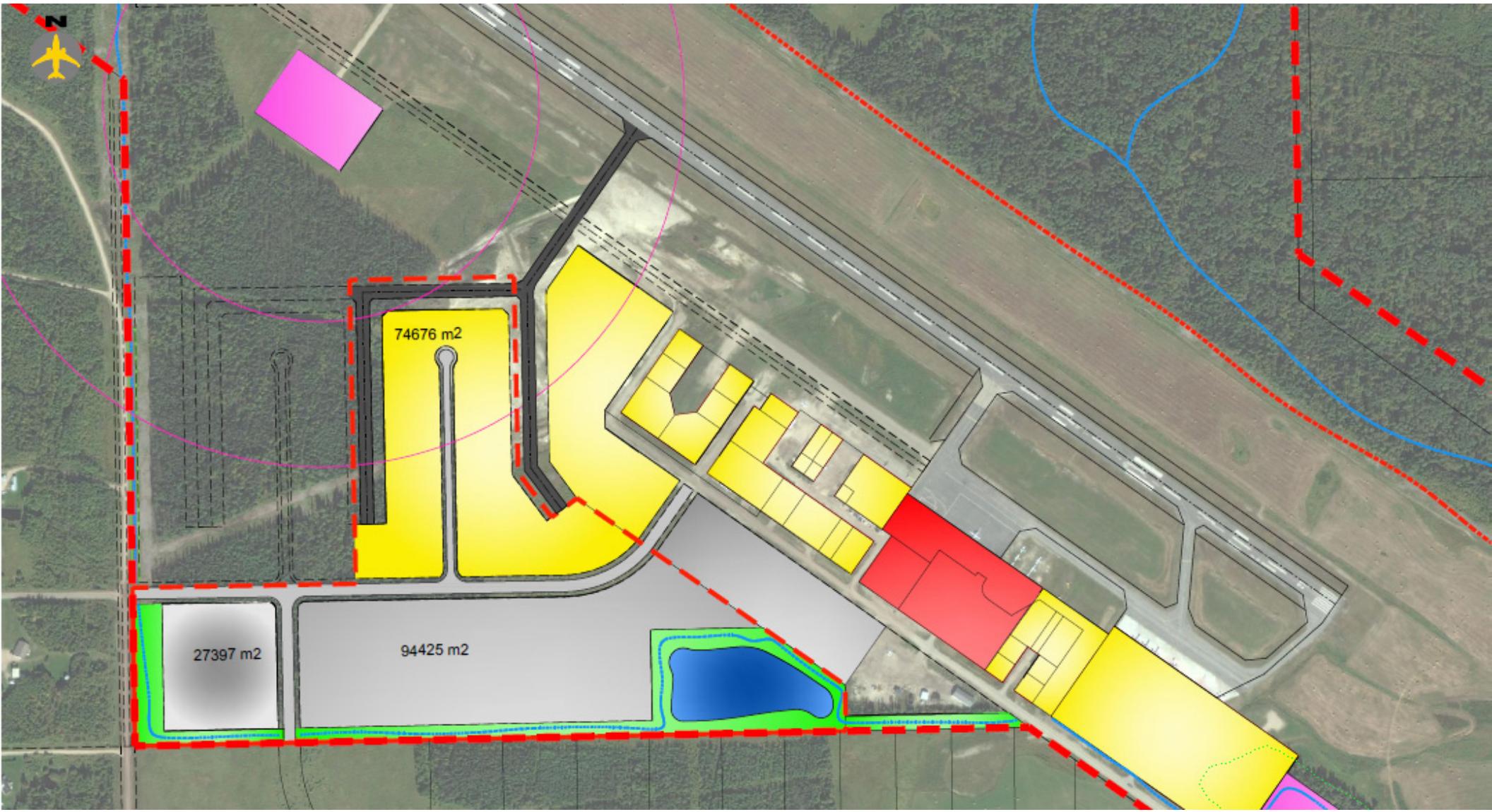
CONCEPTUAL AIRPORT DEVELOPMENT PLAN

PHASE 1 DEVELOPMENT



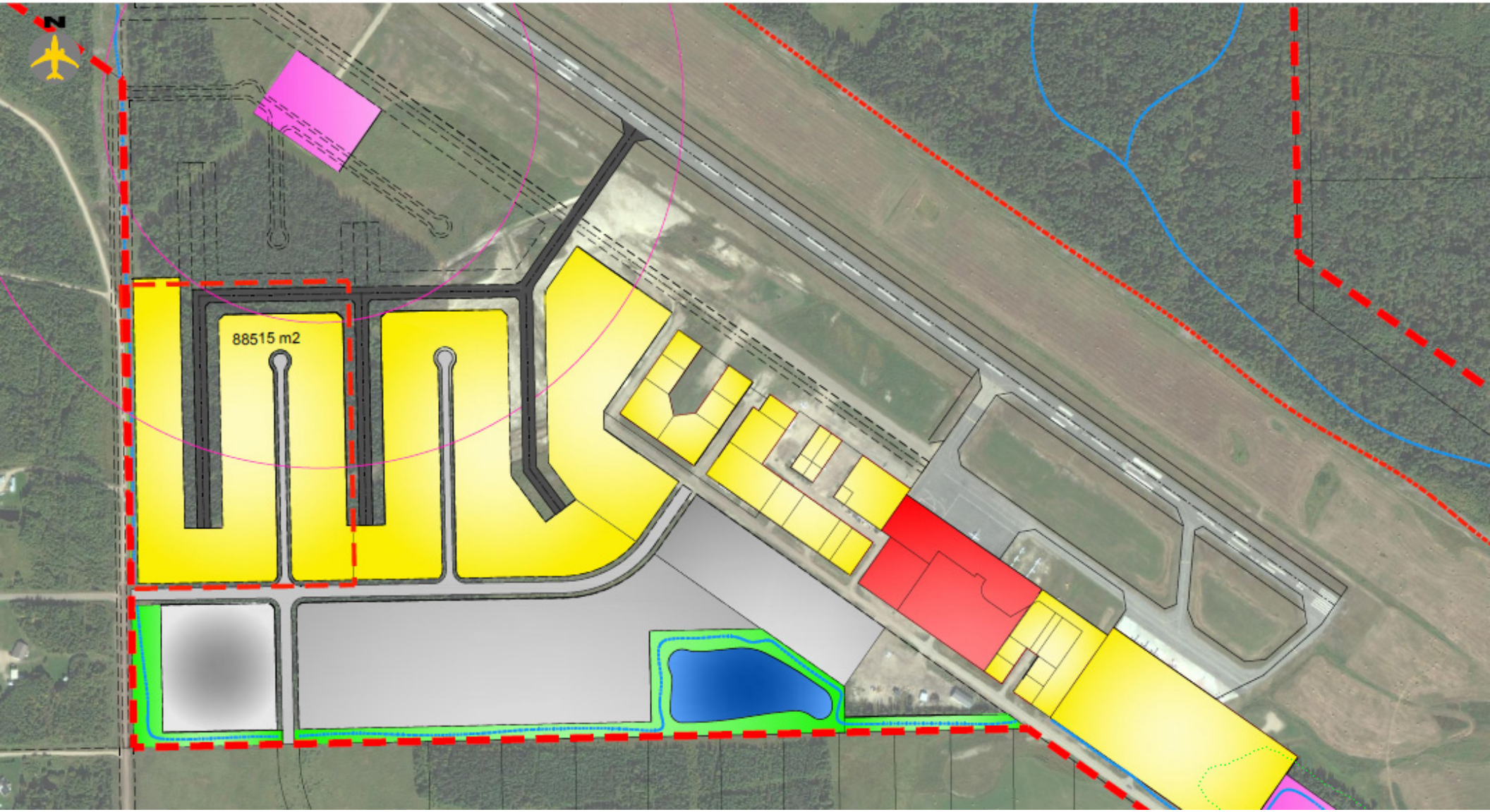
CONCEPTUAL AIRPORT DEVELOPMENT PLAN

PHASE 2 DEVELOPMENT



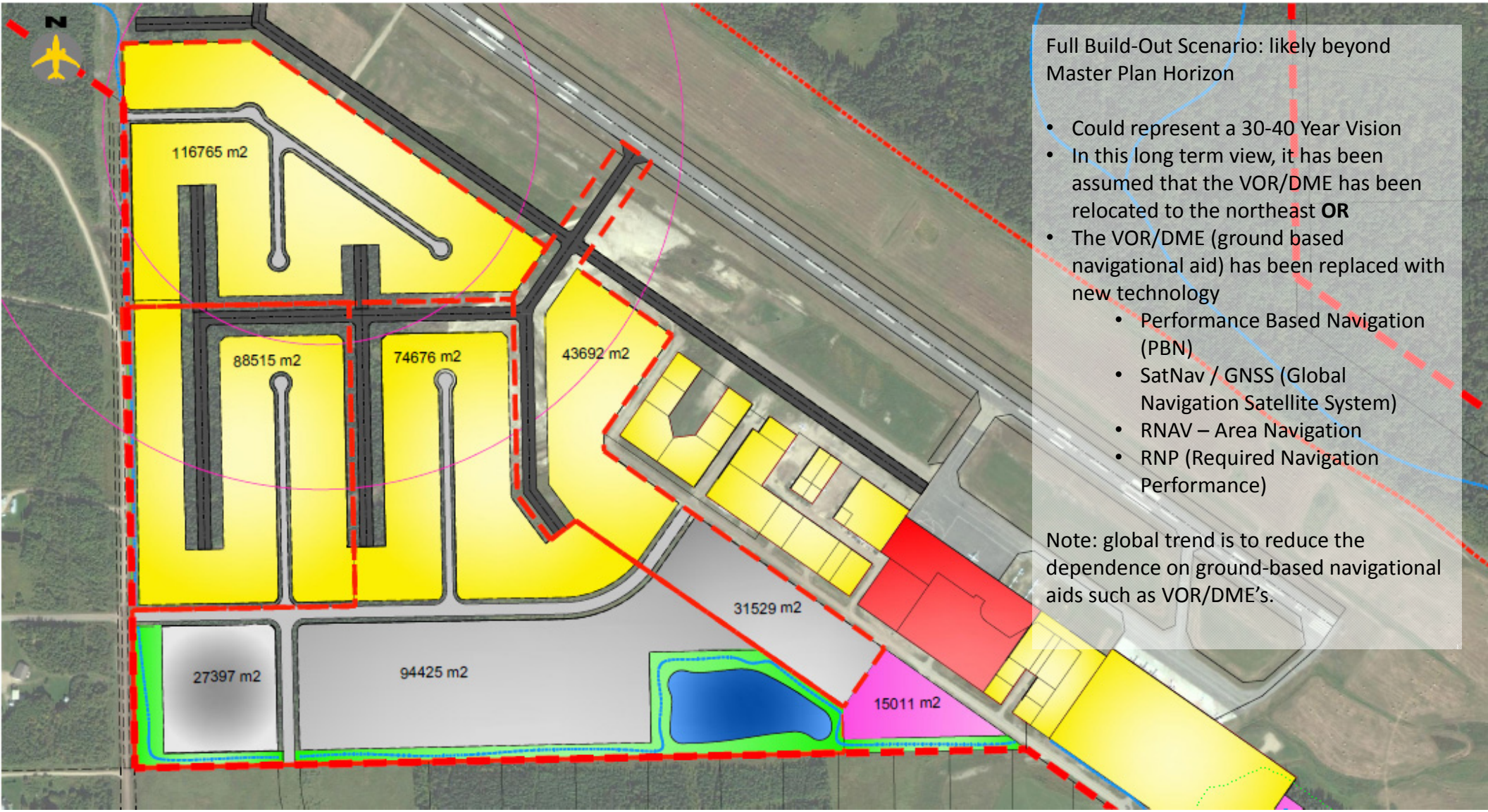
CONCEPTUAL AIRPORT DEVELOPMENT PLAN

PHASE 3 DEVELOPMENT



CONCEPTUAL AIRPORT DEVELOPMENT PLAN

FULL BUILD-OUT SCENARIO



Full Build-Out Scenario: likely beyond Master Plan Horizon

- Could represent a 30-40 Year Vision
- In this long term view, it has been assumed that the VOR/DME has been relocated to the northeast **OR**
- The VOR/DME (ground based navigational aid) has been replaced with new technology
    - Performance Based Navigation (PBN)
    - SatNav / GNSS (Global Navigation Satellite System)
    - RNAV – Area Navigation
    - RNP (Required Navigation Performance)

Note: global trend is to reduce the dependence on ground-based navigational aids such as VOR/DME's.

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIR TERMINAL RESERVE – NEW TERMINAL CONCEPT

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIR TERMINAL RESERVE – NEW TERMINAL CONCEPT

For Planning Purposes, assume Dash 8 Q-400

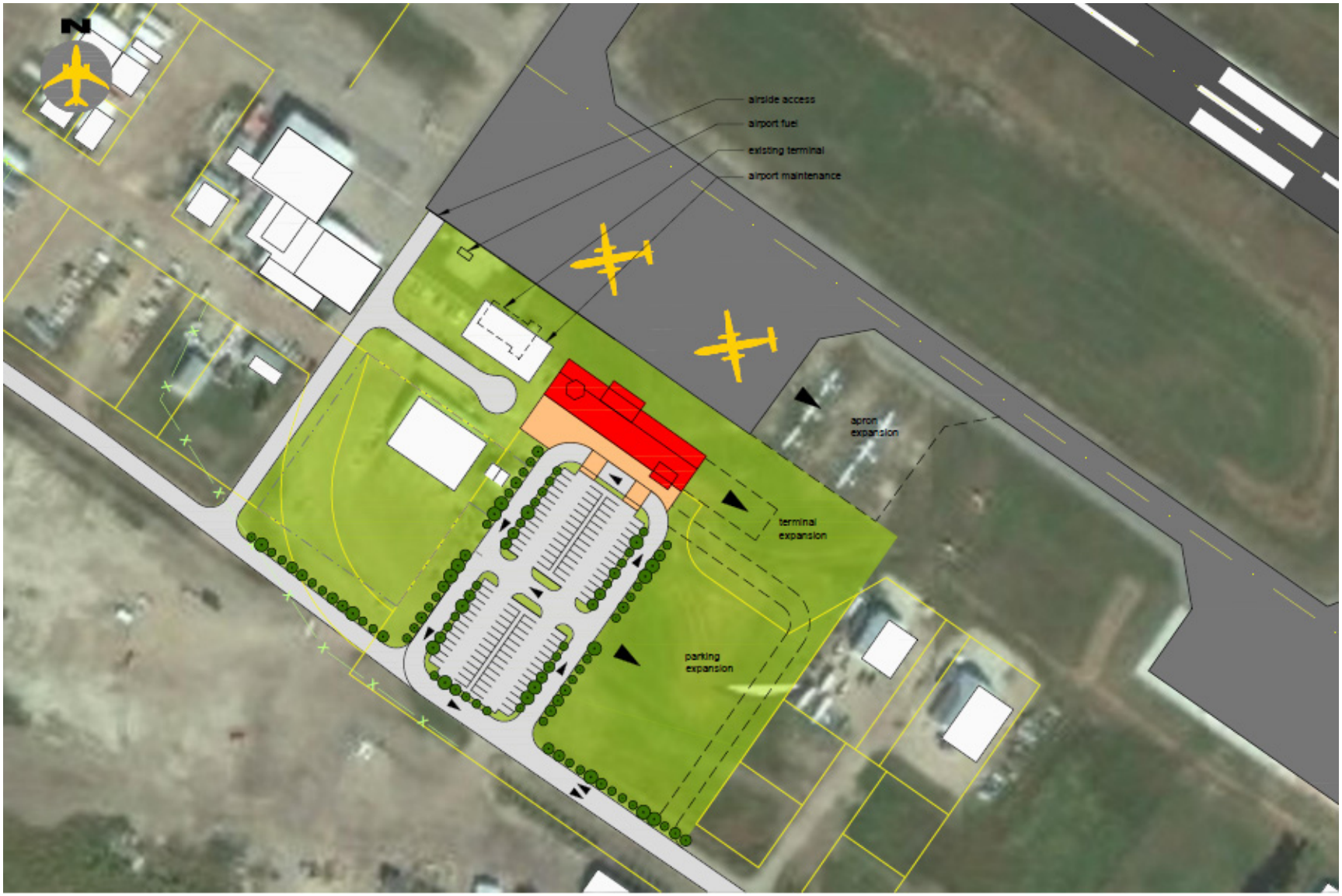
Functional Element	LEVEL OF SERVICE C AIRBIZ Generated Requirements			
	60 pax / Dash8-Q400 at 80% LF		32 pax / 2x Beechcraft 1900 at 80% LF	
	Passenger Processing Area (m^2)	No of Units/ Counters	Passenger Processing Area (m^2)	No of Units/ Counters
Departures				
Check-in Hall	150	3 counters	50	1 counter
Holdrooms	98	46 seats	26	12 seats
Baggage Make Up	70	-	70	-
Arrivals				
Bag Claim / Arrivals Hall	101	1 reclaim @ 25m presentation length	67	1 reclaim @ 25m presentation length
Baggage Breakdown	-	-	-	-
Nav Canada	95		95	
Circulation	131		67	
Offices	40	-	20	-
Washrooms	33	-	17	-
Mechamical/Electrical	33		17	
TOTAL	751	-	429	-
concessions	84		22	

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIR TERMINAL RESERVE – NEW TERMINAL CONCEPT

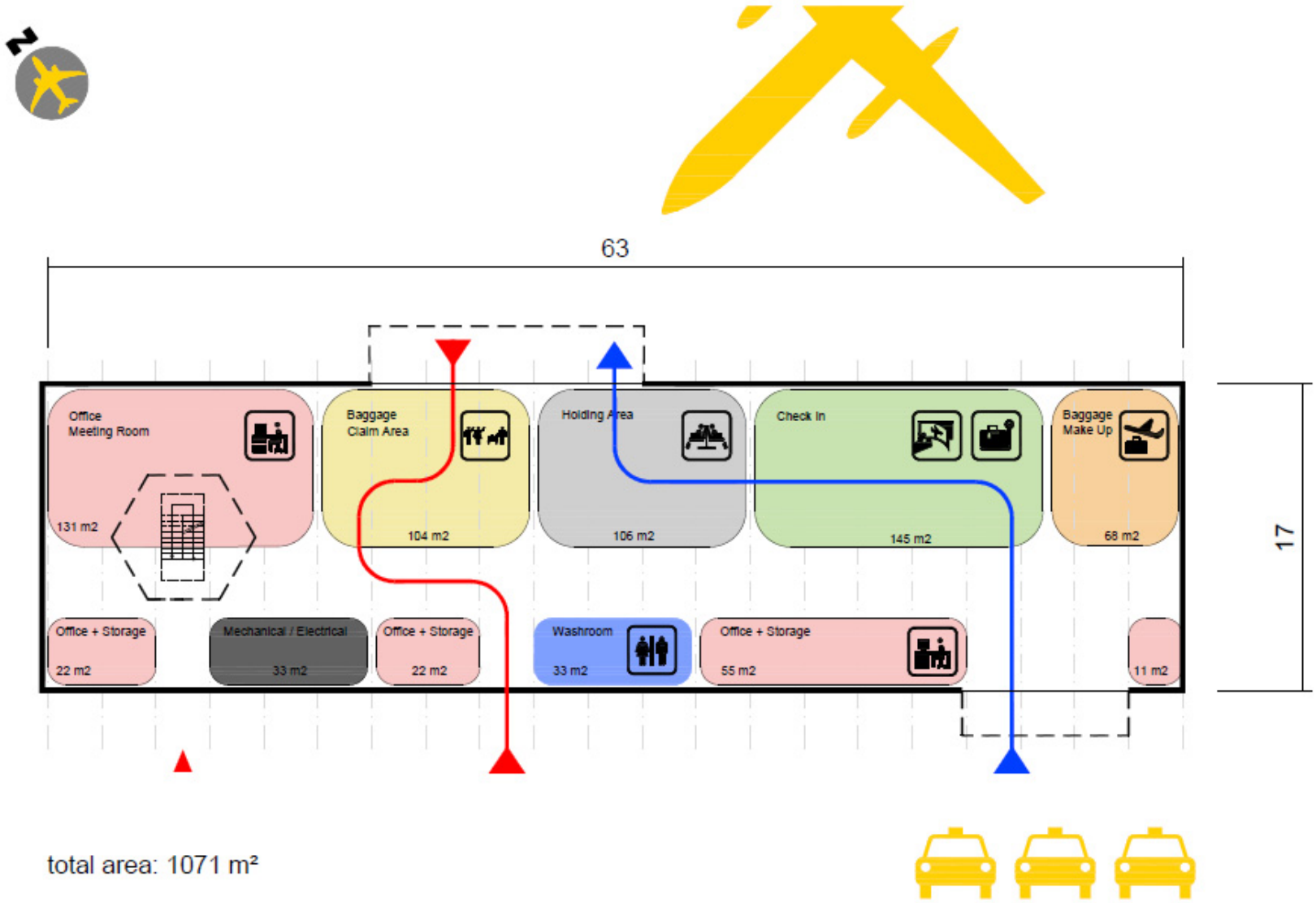
CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIR TERMINAL RESERVE – NEW TERMINAL CONCEPT



CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIR TERMINAL RESERVE – NEW TERMINAL CONCEPT



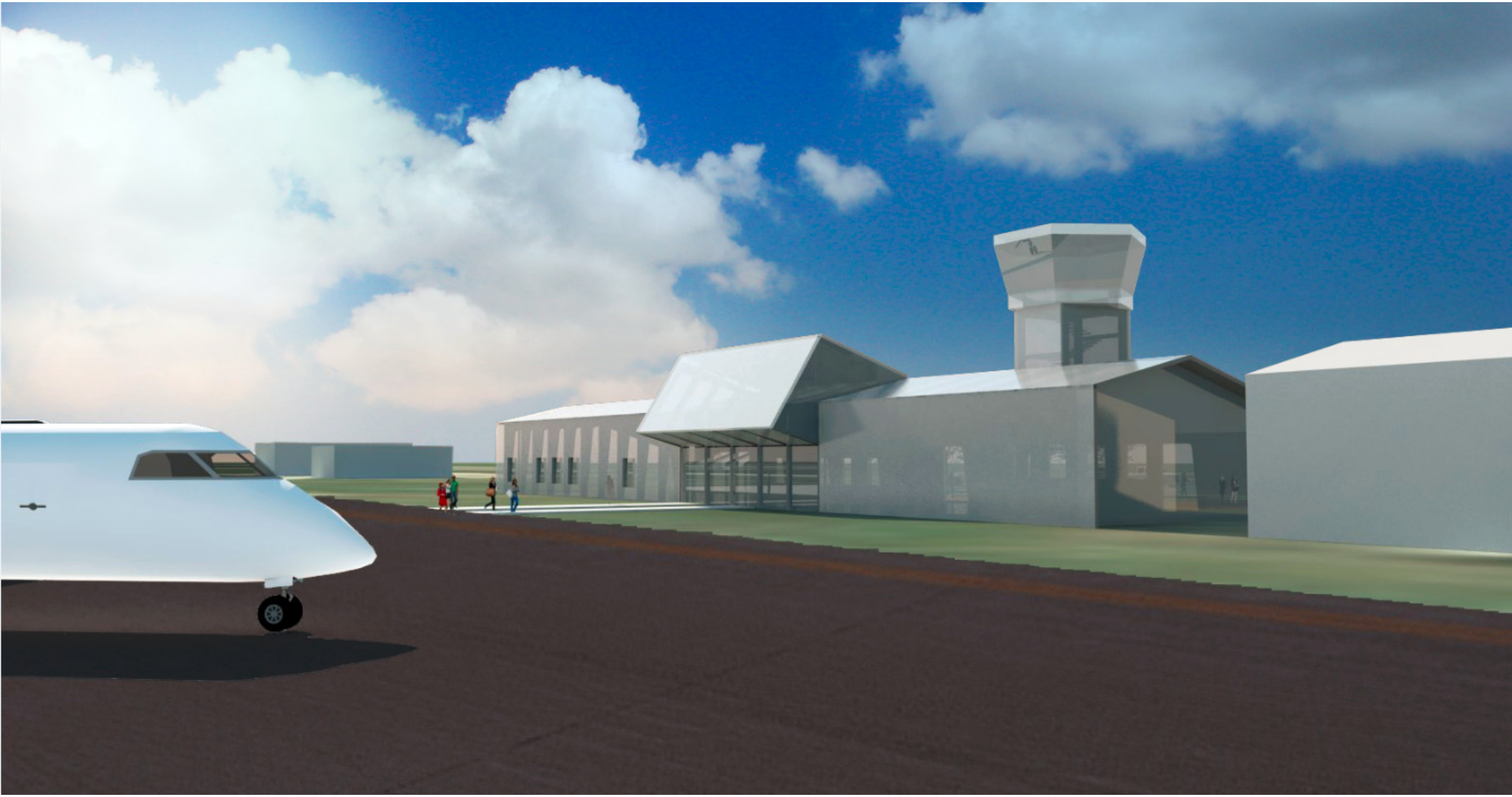
total area: 1071 m²

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIR TERMINAL RESERVE – NEW TERMINAL CONCEPT

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIR TERMINAL RESERVE – NEW TERMINAL CONCEPT



CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIR TERMINAL RESERVE – NEW TERMINAL CONCEPT

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIR TERMINAL RESERVE – NEW TERMINAL CONCEPT

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIRSIDE COMMERCIAL

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIRSIDE COMMERCIAL

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIRSIDE COMMERCIAL

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

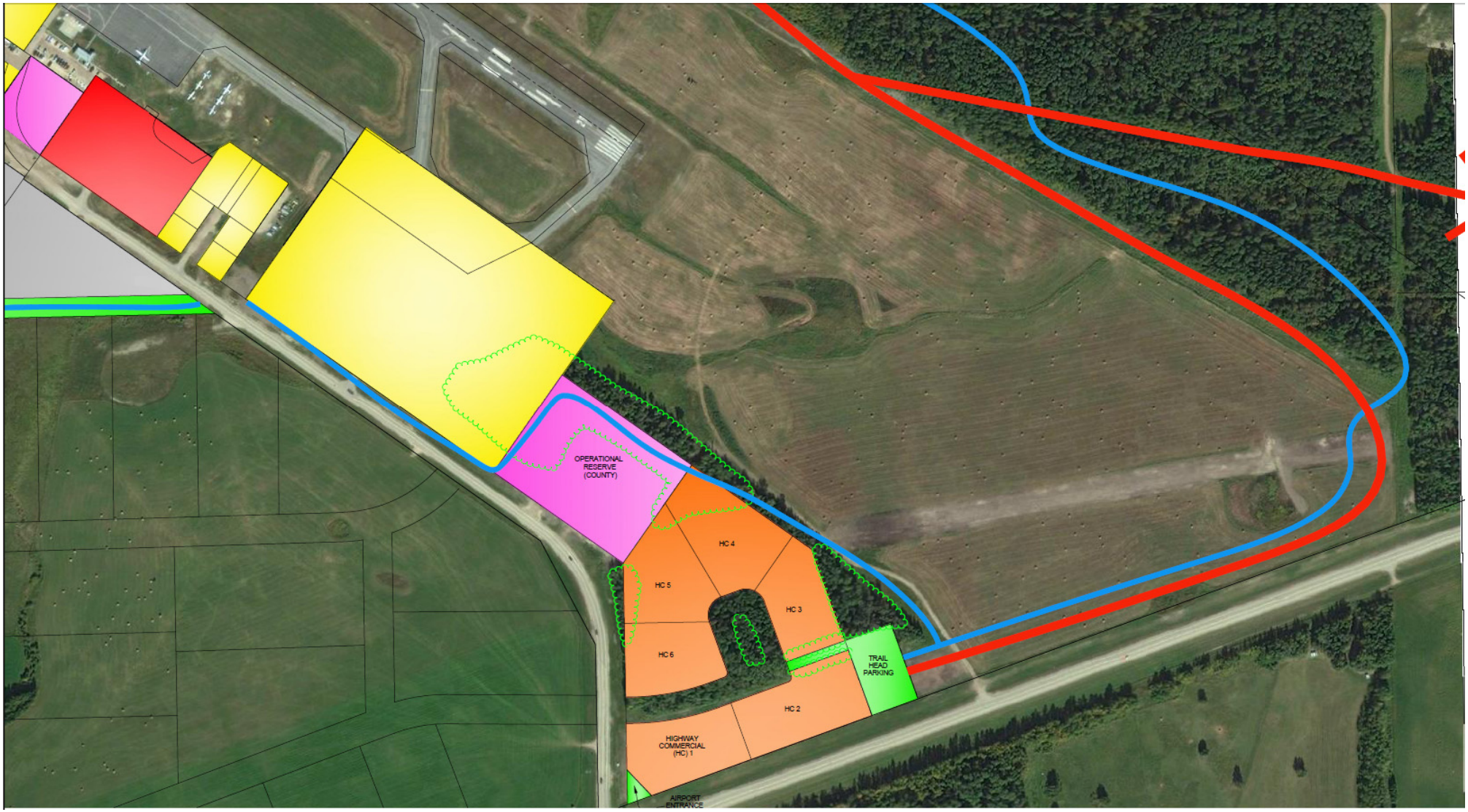
AIRSIDE COMMERCIAL AND RESIDENTIAL AIRPARK

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

AIRSIDE COMMERCIAL AND RESIDENTIAL AIRPARK

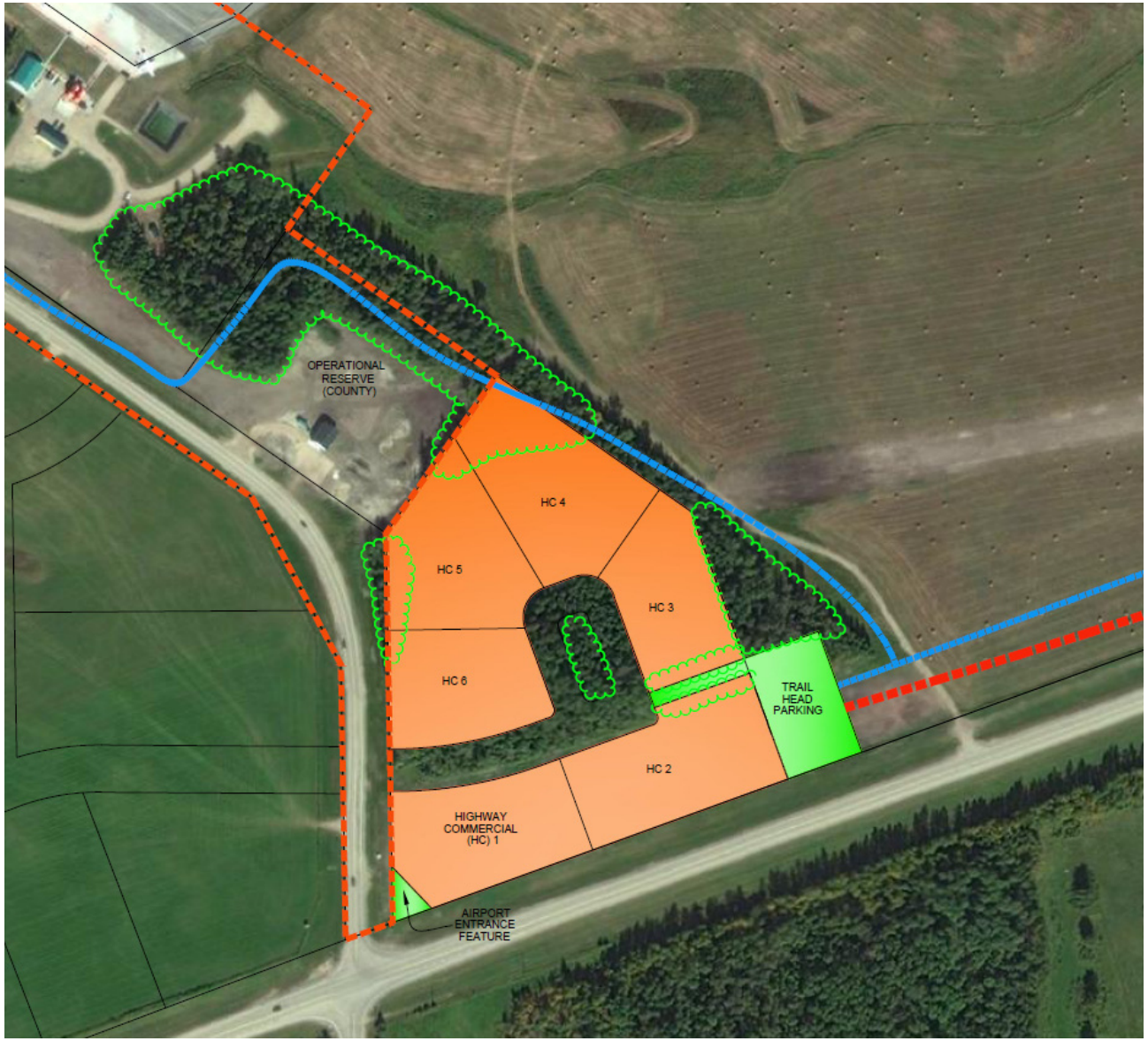
CONCEPTUAL AIRPORT DEVELOPMENT PLAN

DEVELOPMENT CONCEPT – HIGHWAY COMMERCIAL



CONCEPTUAL AIRPORT DEVELOPMENT PLAN

DEVELOPMENT CONCEPT – HIGHWAY COMMERCIAL



CONCEPTUAL AIRPORT DEVELOPMENT PLAN

HIGHWAY COMMERCIAL – CONCEPT PLAN

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

HIGHWAY COMMERCIAL – CONCEPT PLAN

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

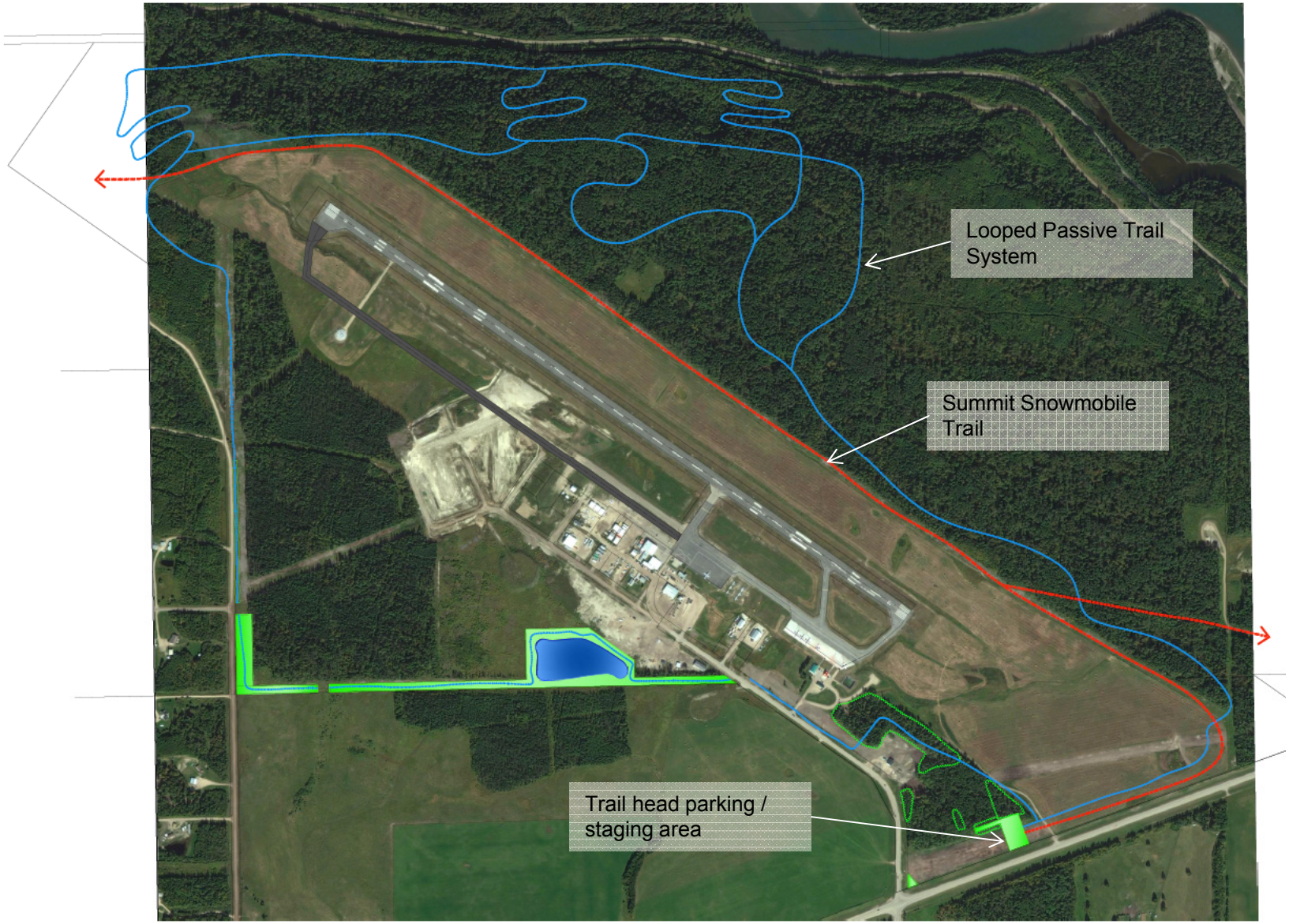
HIGHWAY COMMERCIAL – CONCEPT PLAN

CONCEPTUAL AIRPORT DEVELOPMENT PLAN

HIGHWAY COMMERCIAL – CONCEPT PLAN

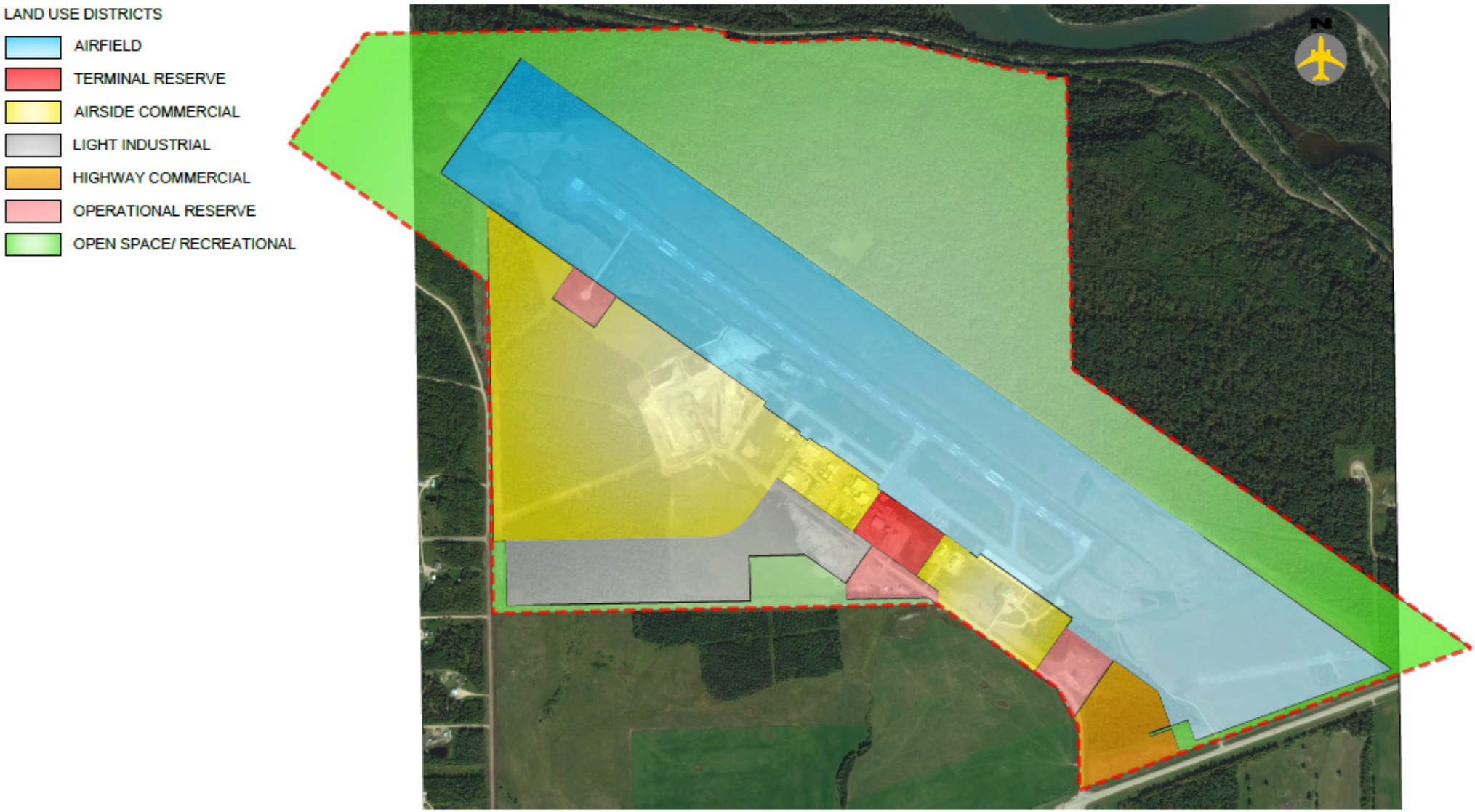
CONCEPTUAL AIRPORT DEVELOPMENT PLAN

RECREATIONAL



5. CONCEPTUAL AIRPORT DEVELOPMENT PLAN

5.4 AIRPORT LAND USE PLAN



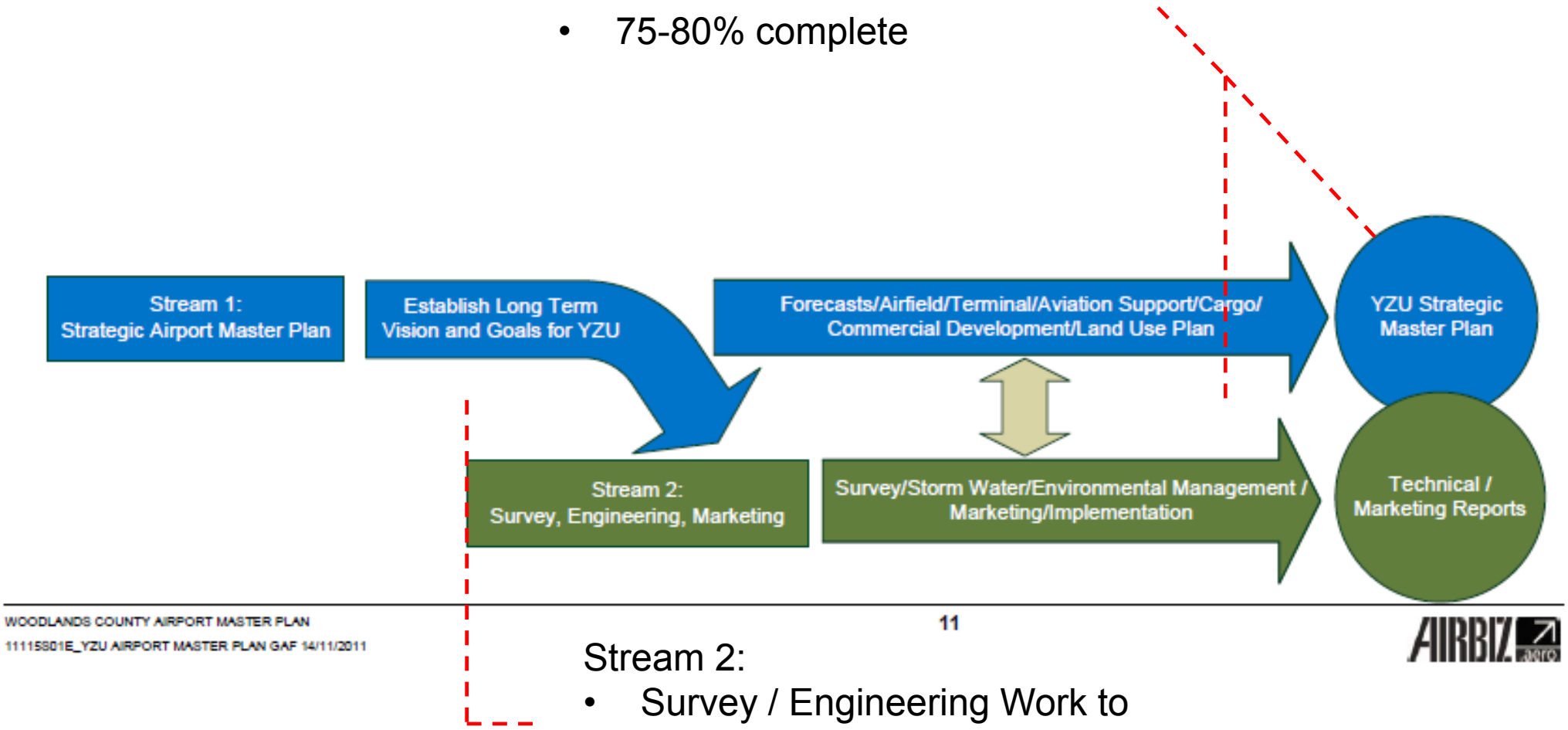
AIRPORT MASTER PLAN

3. PROJECT SCHEDULE

3. PROJECT SCHEDULE

Stream 1:

- 75-80% complete



Stream 2:

- Survey / Engineering Work to commence Spring of 2013
- Work proceeds through Q2 and Q3 of 2013

AIRPORT MASTER PLAN

4. NEXT STEPS

4. NEXT STEPS

- Continue to engage in discussions with stakeholders including NavCanada Technical Staff
- Topographical / Facilities Survey / Engineering Studies
    - Strategic Master Plan helps set the Vision; will guide technical studies
    - Survey to be conducted in Spring … Engineering Studies commence subsequent
    - Survey / Engineering Studies will inform Master Plan (evolutionary process)
- Marketing Initiatives
    - Further discussions with Shell and Air Spray … probe Edmonton Muni
- Final Master Plan: Q3 of 2013

THANK YOU!

WHITECOURT AIRPORT
CONCEPTUAL AIRPORT DEVELOPMENT
STORMWATER MANAGEMENT PLAN

Prepared For:

Airbiz Aviation Strategies Ltd.
#300, 929 – 11th Street SE
Calgary, Alberta T2G 0R4

Prepared By:

PASQUINI & ASSOCIATES CONSULTING LTD.
#300, 929 11th Street SE
Calgary, AB T2G 0R4

File: 501 020 1

December, 2013

Stormwater Management

General

The stormwater management plan for proposed development of the Whitecourt Airport must address storm drainage both in terms of the water quantity and water quality of runoff and discharge. Storm drainage infrastructure will be used to convey on-site drainage to stormwater management facilities which typically consist of wet ponds or dry ponds. Stormwater management facilities provide adequate flood protection by storing runoff and controlling off-site discharge to an acceptable rate; thus, reducing the potential for adverse impacts on downstream areas (e.g. flooding, erosion). If a stormwater management facility consists of a wet pond or a dry pond with a forebay, it will facilitate the removal of Total Suspended Solids (TSS) thus improving the water quality of discharge prior to release into the downstream stormwater conveyance system and the receiving stream.

The stormwater management approach is based on the dual drainage concept whereby the minor system, often consisting of subsurface infrastructure (e.g. storm sewer pipes), provides a basic level of service, conveying runoff from low intensity, more frequent rainfall events. The major system is, by default, surface infrastructure which conveys runoff when the capacity of the minor system is exceeded during high intensity, less frequent rainfall events. It comprises such things as roadways, lanes, pathways, swales and local ponding areas which convey and/or store runoff.

Any proposed stormwater management plan will require the eventual approval from appropriate authorities (e.g. Municipal, Provincial, and Federal). The stormwater management system should adhere to guidelines by both the municipal authority and Alberta Environment and Sustainable Resource Development (AESRD). The following documents from AESRD are currently referenced:

- Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems Part 5 Stormwater Management Guidelines of a Total of 5 Parts (March 2013)
- Stormwater Management Guidelines for the Province of Alberta (January 1999).

Some specific stormwater management design criteria are noted below.

- Overland conveyance infrastructure should be designed to safely convey runoff for minor storm events (up to 1 in 5 year) and major storm events (up to a 1 in 100 year) at flow depths and velocities within AESRD guidelines. Permissible depths and velocities are noted in the following table.

Permissible Depths and Velocities of Overland Flow

Water Velocity (m/s)	Permissible Depth (m)
0.5	0.80
1.0	0.32
2.0	0.21
3.0	0.09

- Depths of flow at curbside gutters should not exceed 0.30 m.
- Standing water (ponding) at low points accessible by the public should not exceed 0.50 m or extend to adjacent buildings.
- A continuous emergency overland escape route should be provided through the development which directs drainage to an appropriate receiving entity (e.g. storm pond, public drainage right-of-way, receiving stream).
- Stormwater management facilities should be sized with an active storage capacity to restrict discharge from the facility to an acceptable allowable release rate for up to a 1 in 100 year event without spillover. Stormwater management facilities are often designed to restrict discharge to pre-development rates. Acceptable allowable release rates should be confirmed as part of an eventual master drainage plan which is typically completed as part of subsequent planning stages.
- Water quality control of runoff should also be considered in the stormwater management strategy formulated as part of a master drainage plan. Some points of mention:
    - Suitable sediment and erosion control practices should be applied (especially during the construction stages of a project) to prevent degradation of conveyance infrastructure and receiving water courses.
    - Stormwater wet ponds or dry ponds with forebays should be sized to provide a minimum 85% removal of Total Suspended Solids (TSS) for particle sizes greater than, or equal to 50 µm (micrometres). Alternatively, such things as oil grit separator (OGS) units can be considered as a means of water quality improvement.
    - Best management practices (BMP) should be applied to reduce or minimize the impacts of stormwater runoff on the environment. They include such things as pollution prevention strategies, source control practices, site control BMPs, and end-of-pipe BMPs as described in AESRD guidelines.

High Level Stormwater Management Plan

It is anticipated that the stormwater management infrastructure to service development of the Whitecourt Airport will comprise mostly a ditch and culvert system (along internal roads) to convey storm drainage overland as part of both the minor and major systems. Though storm sewer pipes may not be preferred, they should be considered where topography, grading, or other constraints warrant their application, or where overland conveyance is deemed not practical. Storm drainage will be directed to stormwater management facilities (i.e. wet pond or a dry pond with a forebay) to control the rate of off-site discharge and provide water quality improvement prior to release into the receiving downstream storm system. Considering the proximity to air traffic, stormwater management facilities containing permanent water bodies may not be preferred. If they are applied, the area of the water body should be minimized and effective measures for wildlife and bird control should be applied as acceptable by approving authorities.

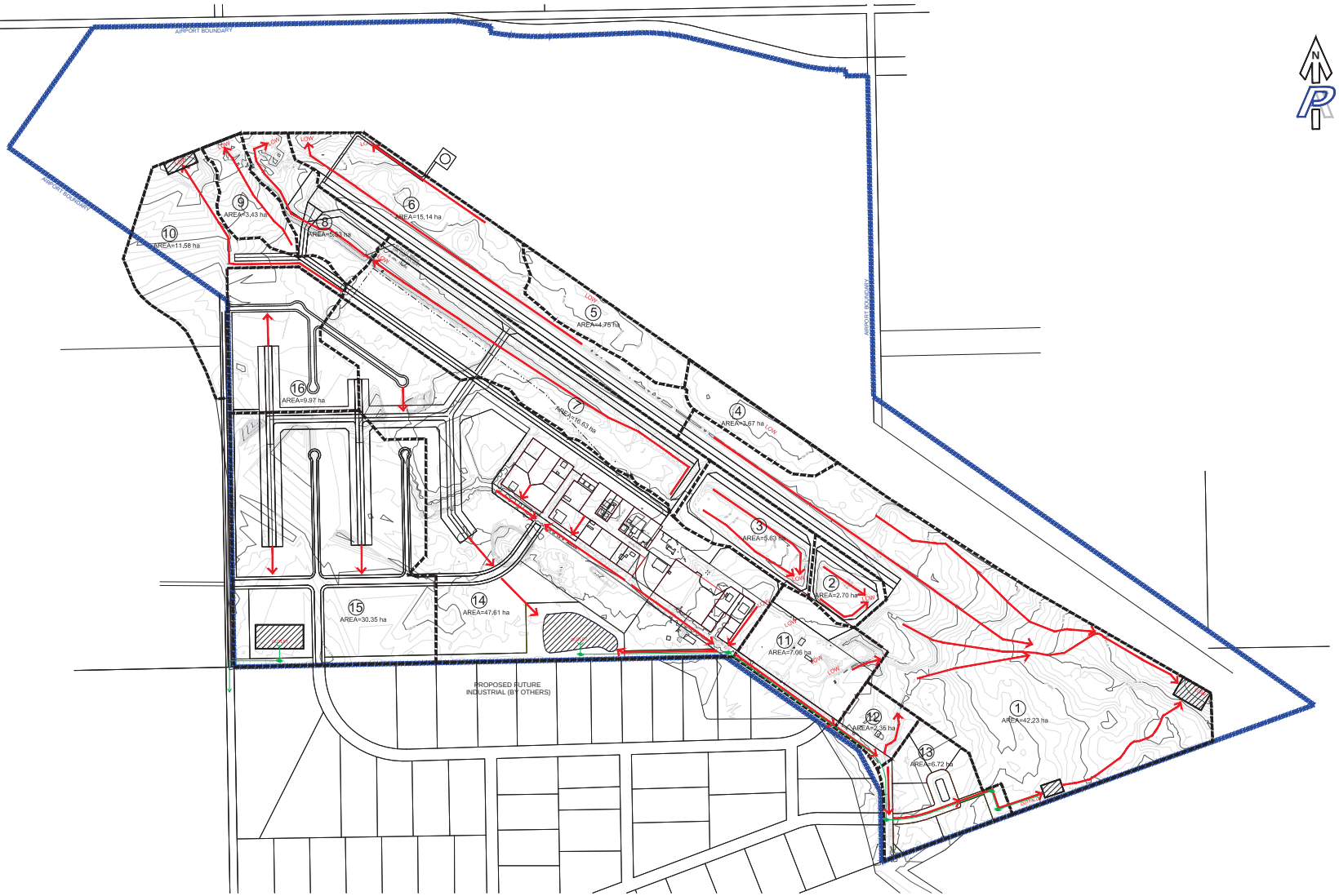
Developing sites should look at incorporating on-site storage where practical to temporarily detain runoff prior to off-site release. Stormwater management should look to directing drainage from impervious areas (i.e. hard surfaces) onto pervious (landscaped) areas in an effort to attenuate discharges and also provide some water quality improvement. Overland conveyance should be via naturally vegetated ditches or swales so as to again improve the quality of runoff and discharge.

Topographical information was reviewed in order to get a general understanding of existing drainage patterns of the airport and surrounding lands. The stormwater management plan for future development within the airport lands should look at trying to mimic existing drainage patterns as best as possible so as to minimize the amount of on-site grading that would otherwise be required and maintaining off-site discharges to the same receiving drainage courses downstream.

Drainage boundaries and subcatchment areas were delineated based on the conceptual airport development plan included in the draft Airport Master Plan dated May 2013 and on existing topographical information (Figure ST-1). A general stormwater management plan which speaks more specifically to the various subcatchments follows.

Undeveloped Subcatchments

Subcatchments which reside outside the proposed development area (generally northeast of the taxiway) will maintain existing drainage patterns and runoff characteristics as generally described on the following pages.



LEGEND

- AIRPORT BOUNDARY
- SUBCATCHMENT BOUNDARY
- ③ SUBCATCHMENT NO.
- OVERLAND DRAINAGE ROUTE
- LOW AREA
- CONCEPTUAL STORMWATER MANAGEMENT FACILITY
- STORM SEWER

SCALE 1:5000

PASQUINI & ASSOCIATES CONSULTING LTD.

STORM WATER MANAGEMENT PLAN
FIGURE ST-1

FILE LOCATION: 501-030-Figure ST-1.dwg PLOT: Reinier Dixson DATE: 4/6/2020 8:08:29 AM SIZE: ANSI full bleed D (34.00 x 22.00 inches)

Subcatchment #1

Drainage from a portion of the runway is directed into a ditch along the northeast side. Existing drainage patterns convey runoff generally to the southeast where it eventually collects at a low area at the southeast corner of the airport lands. Off-site overland escape from this low area would follow existing drainage patterns through the lands to the east.

Subcatchment #2 and #3

Drainage from a portion of the runway and taxiways which surround these subcatchments is directed into ditches which convey runoff in a southeast direction to local low areas within these subcatchments. It is uncertain whether culverts presently drain these lows from Subcatchment # 3 to #2, and #2 to #1. The requirement for culverts can be assessed as part of the future stormwater management strategy at later planning stages. It is left to the discretion of the airport authority as to whether these low areas should be self-contained with eventual overland escape over the taxiways, or whether positive drainage through culverts from these lows is preferred.

Subcatchment #4 and #5

These subcatchments reside northeast of the runway and consist of undeveloped land which drains into local low areas. Off-site - overland escape from these low areas would follow existing drainage patterns through the lands to the east.

Subcatchment #6

Drainage from a portion of the runway is directed into a ditch along the northeast side. Existing drainage patterns convey runoff generally to the northwest where it eventually collects at low areas at the north end of the airport lands. Off-site overland escape from these low areas would follow existing drainage patterns through the lands to the north.

Subcatchment #7

Drainage from a portion of the runway and taxiways surrounding this subcatchment is directed into a ditch which conveys runoff in a northwest direction to a local low where an existing 900mm CSP culvert subsequently conveys drainage northwest into Subcatchment #8.

Subcatchment #8

Drainage from a portion of the runway and taxiways surrounding this subcatchment is directed into a ditch which conveys runoff in a northwest direction to a local low area at the north end of the airport lands. Off-site overland escape from this low area would follow existing drainage patterns through the lands to the north.

Subcatchment #9

The drainage pattern from this undeveloped area is in a northwest direction to a low area at the north end of the airport lands. Off-site overland escape from this low area would follow existing drainage patterns through the lands to the north.

Subcatchment #10

Existing drainage patterns convey runoff from a portion of the taxiway and the undeveloped area to the north where it eventually collects at a low area at the north end of the airport lands. Off-site overland escape from this low area would follow existing drainage patterns through the lands to the north.

Developed / Developing Subcatchments

Subcatchments which are proposed for development will mimic existing drainage patterns and runoff characteristics as closely as possible. Proposed drainage patterns, conceptual locations and sizes of stormwater management facilities are shown on Figure ST-1.

Subcatchment #11

This subcatchment generally comprises an existing tenant facility for operations by the Province of Alberta's Sustainable Resource Development Department (SRD). Existing drainage patterns generally convey runoff internally through overland drainage courses in an east direction where they eventually discharge into Subcatchment #1. Existing topography shows drainage from the apron area (between the site and the taxiway) is directed into the site. Depending on the extent of future development proposed within this site (e.g. aircraft parking), existing drainage patterns can be maintained. However, any future development which results in increased impervious area may necessitate the requirement for additional on-site storage to control the rate of discharge released off-site. Considering the function of this tenant, on-site storm drainage can be directed to on-site storage facilities for retention and eventual use for firefighting. This is left to the discretion of SRD. If off-site discharge from this subcatchment is increased, there may be opportunity also to utilize future stormwater management facilities proposed within Subcatchment #1 to control and treat additional discharge prior to release off-site of the airport lands. This will depend on whether a stormwater management facility is constructed within Subcatchment #1 and whether it is positioned at an appropriate location for interception of drainage from this site (described later). Drainage from the existing access roadway along the southwest boundary (Airport Road) will continue to be conveyed through roadside ditches in a southeast direction into downstream subcatchments.

Given that the SRD base is operational only in the spring, summer and fall (i.e. warm seasons) it is unlikely that de-icing operations would take place at locations within the apron area. However, in the event that aircraft de-icing should occur on this site, the operations should be mindful of drainage patterns and were chemicals associated with the operation may end up. Future development should consider a designated location for de-icing operations with grading such that an appropriate collection point can be established. Consideration should be made to isolate chemically contaminated runoff to a specific area (independent of the common storm system) so as to avoid chemical contamination of runoff, stormwater management facilities, and the receiving streams.

Subcatchment #12

This subcatchment generally comprises a Woodlands County Operational Reserve. Existing drainage patterns generally convey runoff internally through overland drainage courses in a north direction where they eventually discharge into Subcatchment #1. Depending on the extent of future development proposed within this site, existing drainage patterns can be maintained. However, any future development which results in increased impervious area may necessitate the requirement for additional on-site storage to control the rate of discharge released off-site. If off-site discharge from this subcatchment is increased, there may be opportunity also to utilize future stormwater management facilities within Subcatchment #1 as described for the previous subcatchment. Drainage from the existing access roadway along the southwest boundary (Airport Road) will continue to be conveyed through roadside ditches in a southeast direction into downstream subcatchments.

Subcatchment #13

It is envisioned that development within this subcatchment will comprise Highway Commercial. Individual lots should look at implementing on-site storage and directing drainage onto landscaped areas prior to off-site discharge into road right-of-way. Drainage will be conveyed through roadside ditches in an east direction where it would eventually discharge into Subcatchment #1. A small stormwater management facility could be constructed straightaway within Subcatchment #1 for servicing of off-site drainage from this subcatchment exclusively. Alternatively, a stormwater management facility could be considered at the low area in the southeast corner of Subcatchment #1. A facility at this location could also be sized to service off-site drainage from Subcatchments # 11 and #12 should they be developed further. Conceptual locations and sizes of possible stormwater management facilities are shown on Figure ST-1.

Subcatchment #14

It is envisioned that development within this subcatchment will comprise a new terminal, tenant facilities, airside commercial, and light industrial. Individual lots should look at implementing on-site storage and directing drainage onto landscaped areas prior to off-site discharge into road right-of-way. Drainage will be conveyed through roadside ditches and designated overland drainage right-of-ways within the development to a stormwater management facility shown and sized conceptually at the south end of the subcatchment, adjacent the airport south boundary.

Based on existing topography, drainage from a portion of the taxiway and the apron area is directed in a southwest direction towards existing tenant facilities and proposed future development. If lots are not graded appropriately for positive drainage and building slab elevations are not set sufficiently high, this can create adverse drainage conditions including flooding, as has been experienced on occasion within the Boll tenant parcel which contains a local low area. Overland drainage right-of-ways may have to be established within existing and proposed development throughout the subcatchment in order to ensure drainage can be directed through development with no adverse effects. Floor slabs of proposed buildings adjacent to low areas or overland drainage right-of-ways should be set sufficiently above any anticipated ponding or overland conveyance water levels.

For the case of the Boll parcel, a detailed review of site grading should be considered to establish ponding depths and overland spill locations and elevations. The existing building slab elevation should be compared. A solution to the existing condition may require raising of the building floor slab elevation, relocation to higher ground, or the creation of a defined escape route from the low area if deemed feasible. Future development plans should look at re-grading the site so as to mitigate existing drainage issues.

Natural topography suggests that predevelopment drainage from the airport lands contained within this subcatchment is south via existing drainage courses through the adjacent lands, as generally shown on Figure ST-2. Under post development conditions, controlled discharge from the proposed stormwater management facility would similarly want to head south through the adjacent lands as per predevelopment conditions. This option should be considered as it provides the most feasible solution for off-site discharge. The Woodlands Industrial Park Design Brief (BeairtoLehnersKetchum Engineering & Survey Ltd., June 2012) indirectly speaks to provisions for this option. This may warrant discussion with the adjacent landowner so that conveyance of discharge from the stormwater management facility could be incorporated through their proposed development as flow-through. Depending on where the adjacent development is in terms of their planning process, this option may or may not be feasible.

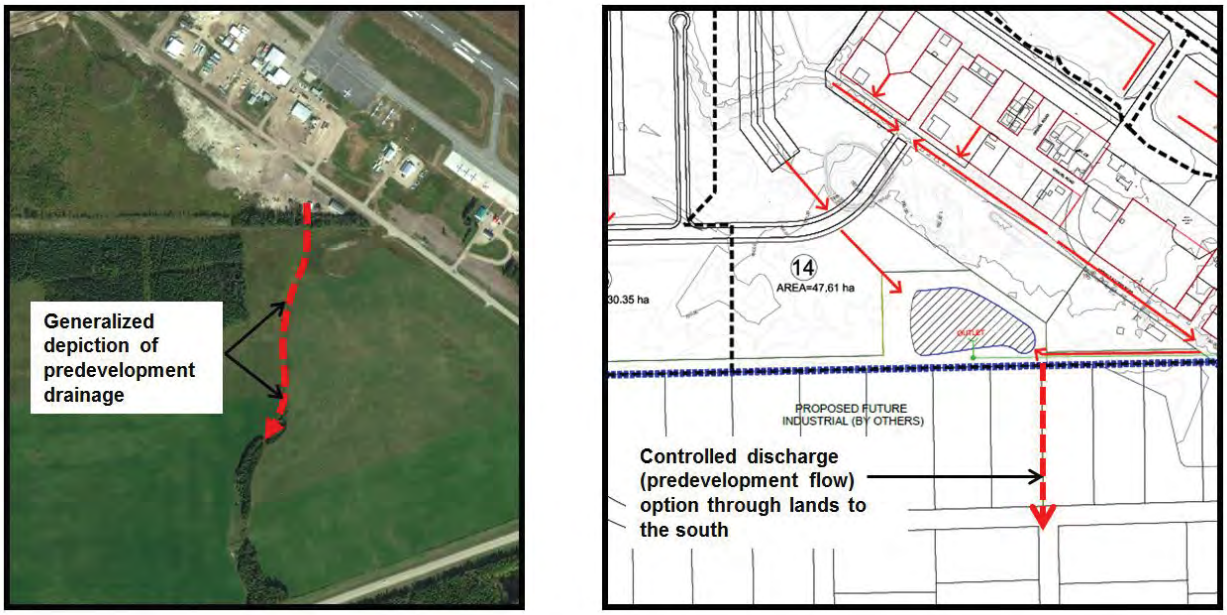


Figure ST-2: Controlled Discharge Option for Sub-catchment #14.

If conveyance through the adjacent development to the south is not feasible, grading constraints may require that a storm sewer pipe be installed to convey discharge from the stormwater management facility east, along an alignment conceptually shown in green on Figure ST-1. Due to grading constraints, a utility right-of-way may be required to an outfall discharging into the existing drainage course through Subcatchment #1.

It is likely that de-icing operations may take place at locations on the air terminal apron area and potentially on other aprons within this catchment area. The operations should be mindful of drainage patterns and were chemicals associated with the operation may end up. Future development should consider a designated location for de-icing operations with grading such that an appropriate collection point can be established. Consideration should be made to isolate chemically contaminated runoff to a specific area (independent of the common storm system) so as to avoid chemical contamination of runoff, stormwater management facilities, and the receiving streams.

Subcatchment #15

It is envisioned that development within this subcatchment will comprise airside commercial and light industrial. Individual lots should look at implementing on-site storage and directing drainage onto landscaped areas prior to off-site discharge into road right-of-way. Drainage will

be conveyed through roadside ditches and designated overland drainage right-of-ways to a stormwater management facility shown and sized conceptually at the south end of the subcatchment adjacent the airport south boundary.

Natural topography suggests that predevelopment drainage from the airport lands contained within this subcatchment is south via existing drainage courses through the adjacent lands. As described for Subcatchment # 14, the option to convey controlled discharge from the proposed stormwater management facility through the adjacent lands to the south should be considered.

If conveyance through the adjacent development to the south is not feasible, grading constraints may require that a storm sewer pipe be installed to convey discharge from the stormwater management facility west, along an alignment through proposed airport development and then south within the existing roadway until grading relief permits for discharge into the roadside ditch. Alternatively, the option to install a pipe along an alignment heading east (along the airport south boundary) and ultimately tying into the pipe from the other Subcatchment #14 stormwater management facility can be considered. The feasibility of either of these options will require further assessment of grades at later design stages.

Subcatchment #16

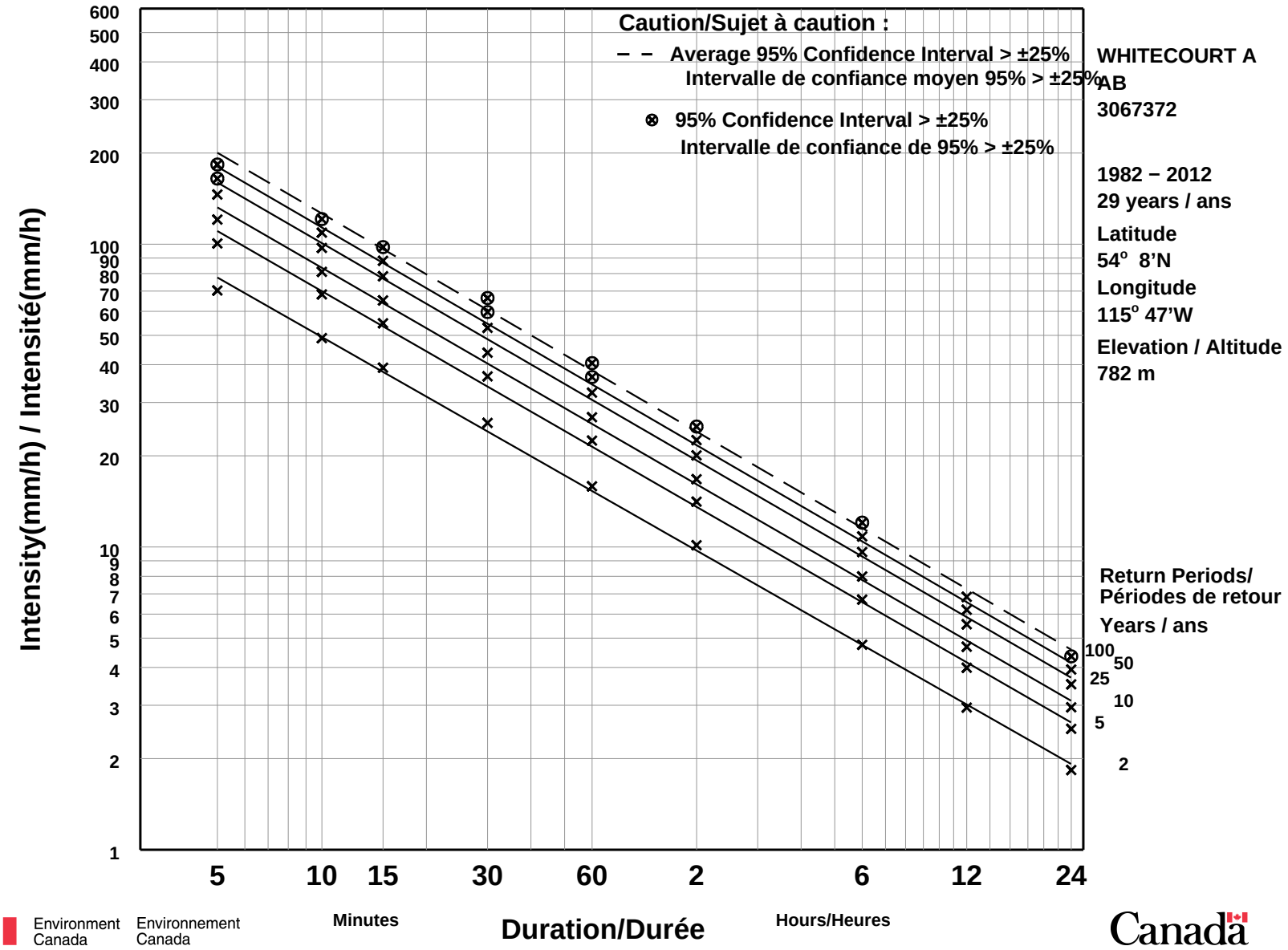
It is envisioned that development within this subcatchment will comprise airside commercial. Individual lots should look at implementing on-site storage and directing drainage onto landscaped areas prior to off-site discharge into road right-of-way. Drainage will be conveyed through roadside ditches and designated overland drainage right-of-ways.

Storm drainage from this subcatchment would be directed into Subcatchment #10. If development of this subcatchment occurs, a stormwater management facility could be created at the low area in the north end of Subcatchment #10. Discharge from this stormwater management facility would follow existing drainage patterns through the lands to the north.

Short Duration Rainfall Intensity−Duration−Frequency Data

2020/03/27

Données sur l’intensité, la durée et la fréquence des chutes de pluie de courte durée



Environment Canada Environnement Canada

Canada