



LPS AVIA
CONSULTING

Master Plan 2009

Peterborough Municipal Airport





Peterborough Municipal Airport Master Plan

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Executive Summary

The Peterborough Municipal Airport is a strong economic driver for both the City of Peterborough and the Kawartha Lakes Region. The Business Case for Infrastructure Development demonstrates that major benefits may be attained from expanding the Airport. The Airport Master Plan presents a cohesive, phased approach to developing the Airport and facilitating growth in aerospace industrial and general aviation sectors, as well as significantly improving services to the general public.

The Plan considers short term (2-5 year), medium term (5-10 year), long term (10-20 year), and ultimate (20+ year) planning horizons. The Master Plan assesses the capacity of the Airport's facilities, including but not limited to runways, taxiways, aprons, air terminal buildings, access, municipal services and lands available for development.

The growth and development of the industrial clientele at the Airport hinges on the state of the national and global economies and their future outlook. The Peterborough Municipal Airport and its associated aerospace industry currently contributes 422 jobs and \$41 million in Gross Domestic Product (GDP) to the region. Traffic at the Peterborough Municipal Airport will depend largely on the health of the aerospace and General Aviation industries, specifically the Maintenance Repair and Overhaul (MRO) and flight training sectors.

The forecasts of aviation activity consider general aviation, scheduled passenger services, charter passenger services, and all-cargo flights. Although all sectors are relevant to planning at the Airport, only General Aviation has had significant activity in recent history. The term "General Aviation" refers to a very diverse mix of activities including corporate flying for executives, small aircraft charter flights, pilot training, air ambulances, prospecting, forest fire fighting, banner towing, aerial sightseeing, non-scheduled services to remote camps, mines, and resorts, natural resources management, crop spraying, heavy lift helicopter services, and civil and military government activity. Overall, the General Aviation sector is expected to grow at the Airport by 2% to 3% throughout all planning horizons.

Scheduled services by national carriers are not expected at the Airport; however, low volume charter or scheduled passenger services using aircraft with up to 19 seats could occur depending on local interest levels. The Master Plan provides for this level of air service activity.

The Peterborough Municipal Airport's runway system serves all current charter, government and general aviation traffic. The original 1,524m (5,000') runway was constructed to accommodate the 1960's vintage DC-9 aircraft. Based on the new recommended design aircraft (Boeing Business Jet / Boeing 737-700), it is recommended that Runway 09-27 be increased to a total length of 2,134m (7,000') in the short term.

Three runway extension options are presented. The recommended expansion option includes extensions on both the east and west ends of the runway. It is recommended that a 106m runway extension be provided on the west end, and a 504m extension be provided to the east. The current runway width of 30m (100') should be maintained. Among other favourable considerations this option minimizes potential environmental impacts associated with Cavan Creek to the west, and the Otonabee River valley to the east. It also allows land between the end of the runway and the Otonabee River for Airport Road to be relocated if desired.

In the short term the Master Plan recommends strengthening Runway 09-27, Taxiway 'A', Taxiway 'B' and a portion of Apron I to support the heavier design aircraft. It is recommended that Taxiway 'B' be extended to a partial parallel taxiway connecting to the new easterly threshold of Runway 27 to facilitate efficient aircraft ground circulation flows, particularly important when mixing training and industrial aircraft traffic.

Development of a new and expanded Apron II is recommended to serve a new air terminal facility, fixed base operation and to provide parking for itinerant and industrial aircraft.

Medium and long term developments recommended include construction of a Code C taxiway to the east of the existing Airport Road to accommodate future aviation industrial development lots, construction of a new airfield maintenance building, extension of Taxiway 'B' to a full-length parallel taxiway connecting to the threshold of Runway 09 and an additional corporate General Aviation development area.

A phased uptake of commercial land at a rate of 1 to 2 lots per year is projected relying on a robust Airport marketing program. Four separate development areas have been identified within the Master Plan and should be made available to support different types of commercial facilities including; a Fixed Base Operator (FBO) with publicly available fuel, aircraft hangars, aircraft assembly facilities, flight training establishments, aircraft maintenance and overhaul facilities, outdoor and air terminal advertising, rental car facilities, educational institutions, and restaurants.

In order to further increase overall activities and revenue at the Airport, several aeronautical and non-aeronautical commercial opportunities are identified and should be explored. All future commercial facilities should be located based on highest and best use airport planning principles.

The Master Plan includes a Phased Development Plan, Airport Servicing Plan and a Recommended Land Use Plan.

Capital cost estimates are provided and call for Short Term investments of \$25.7 million, Medium Term investments of \$6.0 million, and Long Term investments of \$10.8 million. These investments include the \$9.5 million development program already approved and underway at the Airport.

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1.1 Plan Objectives

The Peterborough Airport Master Plan is the overall planning document that will guide the development of the Airport and provide advice to other authorities concerning the appropriateness of surrounding land uses. The Master Plan focuses on the physical facilities and infrastructure of the Airport, the required improvements necessary to meet the future needs of the site and the financial implications of those improvements. The goal of the Master Plan is to enable cost effective development throughout short, medium and long term planning horizons.

The master planning process includes airport development concepts to overcome current and future deficiencies in facilities and infrastructure.

The objectives of the Master Plan are:

- ✈ to ensure safe and economical operation of all aircraft that utilize the facility;
- ✈ to ensure that sufficient land area is reserved for both commercial and non-commercial uses at the Airport;
- ✈ to provide the best location and dimensions for the extended runway; and
- ✈ to ensure that airport development is, to the extent possible, in harmony with the surrounding physical environment.

1.2 Business Case

The Business Case for Infrastructure Development (LPS AVIA 2009) has shown that there is a significant opportunity for development of an aviation industrial park at the Airport.

For the Airport to be competitive in attracting potential industrial tenants, it must have the appropriate level of infrastructure in place, aggressive marketing campaigns, and support of airport stakeholders.

The Airport currently has a good base for industrial development, with a number of companies engaged in complimentary aviation and aerospace activities. Consultations with tenants together with wider industry trends have indicated the need for a variety of airport improvements.

The Business Case defined the opportunities at the Airport. The Master Plan will define the development necessary to help bring these opportunities to fruition.

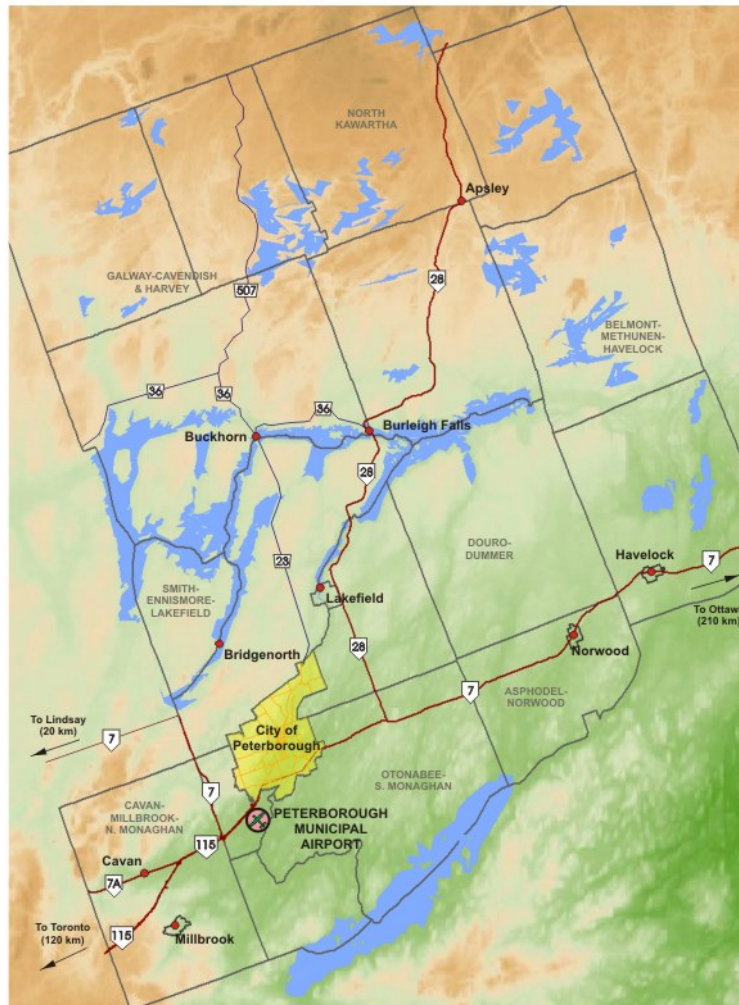
2.1 Geographic Context

Peterborough Municipal Airport (CYPQ) is located at 44° 13' 48" North latitude, 78° 21' 48" West longitude, at an elevation of 190.3 m Above Seal Level (ASL).

The Airport encompasses approximately 276 hectares of land area and is located about 5 km from the City of Peterborough within the Township of Cavan Monaghan, approximately 137 air km northeast of Toronto.

The Greater Peterborough Area is situated in the Kawarthas Tourism Region. The region has a population of approximately 135,000 which normally increases in the summer season. Peterborough offers the largest commercial airport between the two major centres in central and eastern Ontario, Toronto and Ottawa. Due to the location between these centres various aviation and non-aviation businesses have been attracted to the area.

Figure 2-1 – Airport Location



2.2 Transportation Systems

2.2.1 Road

The City of Peterborough and its catchment area is served by a network of roads connecting to various parts of central and southern Ontario.

Highway 115 connects the region to Highway 401 to the south – one of Ontario's major highways joining eastern Ontario and Quebec to the Greater Toronto Area and south western Ontario. The approximate driving time to Toronto is 1.5 hrs.

Provincial Highway 7 connects Peterborough to the community of Lindsay to the west, and to the central Ontario tourist region to the east. Further connections to the east are also provided via Highway 7 to Ottawa, with an approximate driving time of 2.75 hrs.

Connections to the Kawartha region and northern Peterborough County are also provided via provincial Highway 28 and County Road 23.

2.2.2 Air

The Airport has been served by scheduled carriers in the past such as Great Lakes Airlines (CV580) and Air Atonabee (ST27), however airline restructuring and the continual improvement in the provincial highway system have led to the loss of viable local services. Pem Air also provided scheduled services at the Peterborough Municipal Airport in the 1990s.

Scheduled air services for the general public are not currently provided at the Peterborough Municipal Airport. Residents wishing to travel by scheduled air services generally drive to Toronto Pearson International Airport. Ad-hoc charter services are available at the Airport under prior arrangement, generally for corporate users, with a limited use by private individuals or organizations.

2.2.3 Marine

The City of Peterborough is situated on the Otonabee River, which forms part of the Trent Severn Waterway connecting Lake Ontario to Georgian Bay. This was once a means of commercial transportation. Activity on the Trent Severn Waterway is now primarily recreational and consists mostly of small to medium-sized vessels, with limited commercial activity.

2.2.4 Rail

Traditionally the City has been a centre of railway activity and manufacturing. However the City of Peterborough is no longer served by scheduled commercial rail service. Consideration is being given to establishing future GO Train commuter service to the Durham Region and the City of Toronto in the medium-term, depending on demand and passenger trials using a bus connection service from Peterborough that is underway.

2.3 Government Jurisdictions

Peterborough Airport falls within five (5) government jurisdictions with varying responsibilities as described below.

2.3.1 Government of Canada

Peterborough Municipal Airport is a Transport Canada certified airport and is subject to a variety of federal regulations and operational requirements to maintain its certification. Certification is required, among other criteria, in order to allow operation of scheduled air services for the public. The Airport has supported several scheduled air services in the past commencing in the 1970s. This status should be maintained in future in the interests of public safety and to facilitate the possible return of scheduled services, should these become viable in the future.

Transport Canada currently owns, operates or subsidizes 150 of the 726 certified airports in Canada. These airports generally include those within the National Airport System (NAS) and smaller Remote Airports where air services are essential for communities. The Peterborough Municipal Airport does not fall under either of these two classifications.

Limited funding is provided to airports not owned by Transport Canada through the Airports Capital Assistance Program (ACAP). This program has a limited budget and provides funding to smaller certified airports offering scheduled air services that require funds to facilitate airport safety improvements and infrastructure renewal, among other specialized criteria. Because the Peterborough Municipal Airport does not serve scheduled passenger air carriers, the Airport is not eligible for ACAP funding.

Other funding programs may be available for airport infrastructure improvements and renewal through the Federal Government. One example is the Building Canada Fund (BCF) – Canada's new flagship infrastructure program aimed at advancing national priorities that are important to all Canadians, such as a stronger economy, a cleaner environment and better communities. The BCF will total \$4.8 Billion over a seven year period and will focus on projects that deliver economic, environmental and social benefits to all Canadians. Although the program gives priorities to projects related to the national highway system, drinking and wastewater, and public transit, regional and local airports have been highlighted as potential economic drivers eligible for funding under the program. Under this initiative, most municipal infrastructure improvements will be cost-shared on a one-third basis between the Municipality, the Province and the Federal Government.

Although an attractive program for funding airport infrastructure projects, the BCF is sometimes shared with other infrastructure projects, depending on the applications submitted within the municipalities. Projects are assigned priorities under the BCF and in many cases airports fall to the bottom end of the priority list when compared to projects related to the health and well-being of a community (i.e. a water treatment plant or hospital expansion). This can make it difficult for airports to capture their share of funding under the program.

Through Canada's Economic Action Plan, the Federal Government has also established a new \$4 Billion Infrastructure Stimulus Fund (ISF) that provides funding to provincial, territorial and municipal construction-ready infrastructure projects. The ISF complements the existing federal funding by focusing on short-term objectives to stimulate the economy. The full \$4 Billion will be distributed in fiscal years 2009-2010 and 2010-2011 and projects must begin during the 2009 and 2010 construction seasons and be completed by March 31, 2011 in order to be eligible for the funding.

The ISF will provide up to 50 percent of funding for eligible costs related to provincial and territorial assets, 33 percent for eligible costs related to municipal assets (such as the Peterborough Municipal Airport) and not-for-profit private sector assets, and 25 percent of eligible costs for for-profit sector assets. Airport infrastructure improvements at the Peterborough Municipal Airport are eligible for funding under the ISF.

2.3.2 Government of Ontario

The Ministry of Transportation Ontario (MTO) currently operates and manages 29 airports in northern Ontario in order to ensure access to remote communities. Aside from operating and managing these sites, the Provincial Government provides very little support to other airports in Ontario. However, a Pavement Condition Survey was funded in part by the MTO in 2008 to examine the existing condition of runways, taxiways and aircraft aprons at municipal airports within the Province. The aim of this study was to determine future infrastructure renewal costs associated with pavement deterioration at the Municipal Airports.

Many sites were found to have severe issues with pavement surfaces and drainage and were recommended for immediate rehabilitation.

Pavement surfaces at the Peterborough Municipal Airport were found to be in fair to good condition. Ontario's airports were hopeful that the MTO would provide funding for the necessary infrastructure upgrades, however funding has yet to be announced by the Ministry, and some are doubtful that this funding will be provided due to other higher priority initiatives.

2.3.3 County of Peterborough

The County of Peterborough is located in central Ontario and incorporates 8 municipalities, two First Nations land reserves and the City of Peterborough. Peterborough Municipal Airport lies within the boundaries of Peterborough County. Although the Airport is within Peterborough County, the County is not involved in airport operations and development.

Population figures for Peterborough County are shown in Table 2-1.

Table 2-1 – Peterborough County Population

Area	Population
TP of Asphodel-Norwood	4,247
TP of Cavan-Millbrook-North Monaghan	8,828
Curve Lake First Nation	1,060
TP of Douro-Dummer	6,954
TP of Galway-Cavendish and Harvey	5,284
TP of Havelock-Belmont-Methuen	4,637
Hiawatha First Nation	483
TP of North Kawartha	2,342
TP of Otonabee-South Monaghan	6,934
City of Peterborough	75,000*
TP of Smith-Ennismore-Lakefield	17,413

Source: 2006 Statistics Canada Census

* City of Peterborough population is considered separate from the County.

2.3.4 Township of Cavan Monaghan

The Township of Cavan Monaghan lies to the southwest of the City of Peterborough and incorporates the municipalities of Cavan, Millbrook, and North Monaghan. Peterborough Municipal Airport lies within the boundaries of Cavan Monaghan. Consultations suggest that airport developments are currently subject to Land Use By-laws enforced by the Township. However; recent discussions with Transport Canada suggest that since aeronautics falls exclusively under federal responsibility, Transport Canada has sole jurisdiction over aerodromes, airports and any other related buildings or services deemed to be integral to aviation. As a result, Transport Canada does not require airport operators to meet municipal zoning bylaws when building or expanding an aerodrome/airport. Further information on this subject is provided in Appendix E.

Nonetheless, the current land use By-laws set forth by the Township designate permitted uses on the Airport property and are described in Section 3.4. Property taxes paid by airport tenants are provided to the Township of Cavan Monaghan and they are collected by the City of Peterborough.

2.3.5 City of Peterborough

The City of Peterborough owns and operates the Peterborough Municipal Airport, although the site falls outside the city limits. The City has financial responsibility for the Airport and provides all staff and required resources to maintain the Airport's operational status. City staff are responsible for administering all infrastructure projects related to the Airport.

The City of Peterborough administers a program of site/building development review through leasehold and private agreements with leaseholders to ensure that all construction accomplished at the Airport is safe, energy efficient and suitable for the intended occupancy. As the Airport is outside of the jurisdiction of provincial such as the Building Code Act, the City exercises due diligence with regard to airport related construction by ensuring building elements are designed, installed and inspected in accordance with the National Building Code of Canada. This work is overseen by the Development Review Liaison from the City's Building Department.

2.4 Economy

The state of the economy impacts the current and future growth of Peterborough Airport. The vision for the Peterborough Airport sees the Airport being expanded as an aerospace industrial center. The growth and development of the industrial clientele at the Airport hinges on the state of the national and global economies and their future outlook. The Peterborough Airport and its associated aerospace industry contribute 422 jobs and \$41 million in GDP to the region. The aerospace industry is especially important in countering the loss of manufacturing jobs from other industries in the area.

2.4.1 Global Economy

The IMF's April 09 World Economic Outlook and Global Financial Stability Report has indicated that global activity is projected to contract by 1.3 % in 2009. According to the report this represents the deepest post-World War II recession.

Growth is projected to remerge in 2010 at rate of 1.9%, which is considered sluggish in comparison to previous recoveries.

The principal cause of the current global economic malaise was the optimism bred by a long period of high growth and low real interest rates, volatility, as well as financial regulatory oversight failures. The IMF's report has indicated that additional economic stimulus measures would be necessary in 2010. The recommended target for stimulus measures are areas that maximize the long-term benefits to the economy's productive potential, such as spending on infrastructure.

2.4.2 Canadian Economy

Canada has recently experienced a recession which appears to be nearing conclusion. A decline in commodity prices and exports, coupled with soft domestic demand, will lead to a 1.7 per cent drop in real GDP in 2009. It is expected that economy will continue to contract however the rate of decline will continue to moderate. The fundamentals of the Canadian economy remain strong and recovery and growth are expected by 2010.

2.4.3 Peterborough Economy

Peterborough has a well diversified mix of manufacturing and service businesses. No single company or industry dominates the economic base.

Major private employers include General Electric, Siemens, PepsiCo Quaker, Sysco Food Services, Ventra Plastics, Safran Electronics, GTS Lufthansa and Minute Maid (Coca Cola). Public employers include The Peterborough Regional Health Center, Trent University and Sir Sandford Fleming College. Many residents of Peterborough commute to employment at the General Motors plant at Oshawa and Ontario Power Generation plants at Pickering and Clarington.

2.4.4 Aviation Trends and Outlook

The global recession has caused severe financial pain to the world's airlines. The world's airlines are expected to collectively lose \$9 billion US in 2009. Revenues are expected to decline by \$80 billion to \$448 billion this year, and the weakness will persist into 2010.

The General Aviation Manufacturers Association (GAMA) has stated that in the first three months of 2009, deliveries of general aviation aircraft totalled 462 units, which represents a 41.1 % decrease when compared to the same period last year.

Despite the current short term economic contraction, investment decisions have to be based on the long term economic impact of a project. The aviation industry is very cyclical and follows the trends in the wider economy. Consequently a brief review of the aviation industry's long term trends and fundamentals help to focus on the correct planning horizon and posture to be adopted. The current economic downturn has only served to reinforce the changes coming to the aviation industry.

The very high cost structure, as well as the need to control aviation emissions is forcing manufacturers to utilize new design philosophies for their aircraft. The requirement to improve aircraft efficiency has accelerated the retirement of older generation aircraft. Several new programmes have been launched or are nearing flight test. In Canada, Bombardier has launched production of the new C-series, with design work well under way. The Boeing 787 program is about to enter flight testing, while the Airbus A350 is in the design phase. All these aircraft make use of new composite materials, engine technologies and avionics.

Global regions with the highest aviation growth prospects are India and China. These countries are in a phase of rapid economic and technological development, and are at the forefront of the emerging economy nations. In the long term these nations will continue to drive the need for new aircraft as their economic prosperity increases.

Southern Ontario is home to many globally competitive aerospace firms, active in engine, airframe, avionics, and simulation equipment design and manufacturing. The Peterborough region offers a number of advantages to the aerospace industry, including a well educated human resource base and the presence of several high technology companies. The City of Peterborough is home to a major aerospace manufacturing subsidiary as well as a thriving aircraft modification company.

In addition, several smaller aviation firms provide component overhaul, flight training and aircraft parts sales and services.

Given this existing foundation, the Business Case for Infrastructure Development at the Peterborough Municipal Airport identified a number of aviation business lines that would most likely develop or be enhanced if the Airport's facilities and infrastructure were to be improved.

These businesses include:

- ✈ Maintenance Repair Overhaul (MRO);
- ✈ Engine and Component Overhaul;
- ✈ Aerospace Manufacturing; and
- ✈ Aerospace Education.

Each opportunity would be enhanced by infrastructure improvements to the Airport. The future aviation trends coupled with the existing aerospace activity translates into a distinct aviation growth opportunity at the site. This opportunity can be realized in part, by having the right infrastructure in place and by pursuing an aggressive marketing and aerospace industrial recruitment and marketing strategy.

2.5 Community Concerns

2.5.1 Community Consultations

Extensive stakeholder consultations were held during preparation of the Business Case for Development. Supplemental consultations were undertaken as deemed appropriate for the Master Plan and a number of additional stakeholders with current and potential future interest in the Airport's development were contacted. Stakeholder consultations included, but were not limited to airport tenants, the Greater Peterborough Economic Development Corporation (GPAEDC), the County of Peterborough, the Township of Cavan Monaghan, Transport Canada, and the City of Peterborough. Input from previous consultations conducted during the development of Peterborough Airport's Business Case for Infrastructure Development was also considered during the development of the Master Plan. A list of stakeholder consultations conducted during the master planning process is provided in Table 2-2 below.

Table 2-2 – Consultation List

Organization	Name	Title
City of Peterborough	Paul Ayotte	Mayor
City of Peterborough	Nancy Hewitt	Operations & Development Coordinator
City of Peterborough	Malcolm Hunt	Director of Planning
City of Peterborough	Trent Gervais	Acting Airport Manager
City of Peterborough	Linda Reed	CAO
City of Peterborough	Jack Doris	City Councillor
City of Peterborough	Len Vass	City Councillor
City of Peterborough	Eric Martin	City Councillor
City of Peterborough	Doug Peacock	City Councillor
City of Peterborough	Henry Clarke	City Councillor
County of Peterborough	Ron Gerow	Warden
County of Peterborough	Gary King	CAO
County of Peterborough	Chris Bradley	Director of Public Works
Township of Cavan Monaghan	Neal Cathcart	Reeve
Township of Cavan Monaghan	Yvette Hurley	CAO
Township of Cavan Monaghan	Karen Ellis	Director of Planning
Township of Cavan Monaghan	Brian Bartlett	Councillor
Otonabee Region Conservation Authority	Jennifer Clinesmith	Manager, Planning and Regulations
Chem-Ecol Ltd.	Brian Milner	President
Private GA Tenant	R. L. Smith	Owner
Trillium Aviation Corp.	Marc Hiemstra	President
Private GA Tenant	Frank Grani	Owner
Airtech Canada Aviation Services	James Mewett	President
Aerotrike Aviation	Cathy Tinney	President
Canadian Owners and Pilots Association	Kevin Psutka	President
Ultralight Pilots Association of Canada	Cathy Tinney	President
Shield Source	Lisa McMurray	General Manager
WM Aeroservice	Winston Maw	President
Private GA Tenant	Neil Nadeau	Owner

2.5.2 Economic Development

Stakeholders generally agreed that Peterborough Municipal Airport has potential to act as a strong economic driver for the Peterborough region. The majority of stakeholders support the recommendations made within the Business Case for Infrastructure Development regarding facility expansion.

These recommendations focused primarily on extending the length of Runway 09-27 to 2,134m (7,000') and increasing the overall supply of aviation commercial land for lease. These developments are expected to make the Peterborough Municipal Airport globally accessible and more competitive in many aerospace sectors.

The Maintenance Repair and Overhaul (MRO) business is expected to be the greatest economic driver as these facilities typically employ 300-500 staff, generating significant net present value in the area's Gross Domestic Product (GDP) when more fully developed.

2.5.3 Access to Transportation

Many users and tenants have selected the Airport as their base of operations due to the facilities provided and the proximity to their residences. Easy access to the Airport was considered an important asset to most stakeholders consulted during the development of the Master Plan, including tenants, government departments, and local businesses. In general, stakeholders would like to continue to see the Peterborough Airport operate as an airport supporting local transportation needs for local business and commerce, private aircraft operators, and the Peterborough region as a whole.

Stakeholders also supported the assumption that high volume scheduled air services are unlikely to develop at the Airport. There was a general understanding that local residents prefer to travel via road to Toronto Pearson Airport, due to the lower flight costs offered from Toronto based high-volume traffic and competition between air carriers. However, access to private charter flights and a low-volume scheduled or charter service with aircraft seating approximately 19 passengers (commuter class) or less could occur at the Airport in the future.

Stakeholders indicated that the ability to support these services should be accommodated in the Master Plan. The future Air Terminal and Fixed Based Operator (FBO) facility recommended in Chapter 5 would adequately serve these low-volume scheduled and charter air services, in addition to other local and itinerant corporate aviation activity.

2.5.4 Environmental Impact

Although there are several environmental constraints that could affect development of the Airport, the overall environmental impact of expanding the Airport facilities is not considered as a major development constraint by most stakeholders.

Stakeholders agree that airport developments should be designed to have minimal environmental impact on Cavan Creek, the Otonabee River, and the provincially significant wetlands present on the Airport property.

Although a detailed Environmental Assessment (EA) has not been completed to address future airport developments, the Master Plan takes into consideration the major constraints identified above, and identifies future development based on information obtained during preliminary consultations with environmental engineers, local governments, and other stakeholders including the Otonabee Region Conservation Authority (ORCA).

2.5.5 Other Issues

Some tenants expressed concerns with local flooding on the Airport site. This is due to the Airport's presence in a low-lying area, with some portions of the Airport located within the Otonabee River and Cavan Creek floodplains.

The current Airport Development Program includes filling many of the low-lying areas located adjacent to the extended Apron I and within the General Aviation development area. The filling process, combined with building flood proofing, is expected to mitigate the risk of floods for new buildings; however, existing facilities could still be subject to more severe flooding, especially during the spring melt. It is recommended that a detailed engineering study be conducted to examine drainage patterns on the Airport and identify methods to adequately mitigate the risk of flooding in both current and future airport development areas identified herein.

Some stakeholders also raised concerns regarding the financial viability of the Airport and the long term ability to be self-sufficient. Concerns were raised regarding the 'deficit' that might be created by capital investment and ongoing operations and maintenance costs related to the developments highlighted within the Master Plan and development program.

They noted that increased expenses should not be entirely borne by airport users, but rather be recognized as an ongoing investment in the Airport for the direct and indirect economic benefits that the Airport brings to the community. On many occasions at other sites, airport management has been forced to raise user fees to break even. Such strategies can make the Airport increasingly unattractive to small aircraft owners and operators, especially since developments such as runway extensions are not undertaken to benefit these users.

Stakeholders suggested that the City include in its commitment to developing the Airport, a commitment to fund any operating deficit in recognition of the regional economic benefits derived from the Airport.

Airport governance was also highlighted as an issue by stakeholders. Although this issue is outside the scope of the Master Plan study, it is suggested that an airport governance study might be contemplated once infrastructure developments related to the runway expansion are completed.

3.1 Role and Designation

3.1.1 Role

The Airport Role Statement is the fundamental starting point in classifying current activity and determining a future position in terms of long-term activities and development at the site.

The Peterborough Municipal Airport is certified in accordance with the requirements of Transport Canada document TP312E - Aerodrome Standards and Recommended Practices. The Airport Certificate acknowledges that the Airport meets all regulatory and operational requirements of the Canadian Aviation Regulations (CARs), and essentially enables the Airport to accept scheduled air services, although scheduled services are not provided at present.

The Airport serves the needs of industrial and air charter operators, as well as General Aviation (GA) users, primarily engaged in recreational flying activities. In order to maximize the economic capabilities of the Airport, the role of the Peterborough Municipal Airport should be to provide:

- ✈ a base for national and international aerospace manufacturing, aircraft overhaul and maintenance;
- ✈ a base for charter aircraft operations
- ✈ a point of service for local and regional commuter air services;
- ✈ a base for flying training activities;
- ✈ a location for aviation and aerospace trades education;
- ✈ a tourism gateway to the Kawarthas;
- ✈ a base for corporate and private aircraft owners and operators;
- ✈ a base for general aviation activities and support.

3.1.2 Designation

Peterborough Municipal Airport is a locally owned and operated airport and is not classified under Transport Canada's National Airports System.

3.2 History

The Airport lands were originally purchased in the early 1960's by an aerial photographer and pilot Harry Oakman. He setup Peterborough Airways, which included a flying school. In 1965 Bradley Air Services based at Carp Airport (near Ottawa) established a satellite operation at Peterborough Airport which later became Trent Air.

Over time the Airport grew to have two turf runways able to accommodate aircraft up to the DC 3 in size and in the late 1960's, the City bought the Airport property. Further construction was undertaken by the federal Department of Transport and the Airport was equipped with a 5,000-ft paved runway, lighting, and a meteorological office making the Airport capable of supporting future scheduled operations by aircraft up to DC-9 in size. The Peterborough Municipal Airport facility was officially opened September 21, 1969.

Trent Air ran the Airport for several years. In 1971 Otonabee Airways was established in Peterborough operating charter services, and by 1975 it operated scheduled services. In 1980 the company was renamed Air Atonabee with scheduled air services operating between Peterborough, Toronto, Ottawa and Montreal using 23 seat Saunders ST-27 aircraft. In 1984 Air Atonabee became City Express and relocated its home base to Toronto Island Airport. During the late 1970s Great Lakes Airways operated scheduled services from its home base in London to Peterborough and on to Ottawa, among other services using 52 passenger Convair 580 aircraft. The airline subsequently became Air Ontario and ceased serving Peterborough. In the 1990s Pem Air offered short-range scheduled commuter flights from Peterborough to destinations in central and eastern Ontario, and Montreal. There are no scheduled services currently serving the Airport.

3.3 Current Infrastructure

Peterborough Municipal Airport includes two runways, three taxiways, and a large public apron. The core development area is located in the northeast quadrant of the Airport property. The Airport site is illustrated in Figures 3-1.

Airport information has been derived from various aeronautical references including the Airport Operations Manual (AOM), Canada Flight Supplement (CFS), and the Canada Air Pilot (CAP). The following table shows key data specific to the Airport. This data is generally used for aviation operations and airport planning purposes.

Table 3-1 – Aerodrome Data

Reference Point (coordinates)	N 44° 13' 48" W 78° 21' 48"
Reference Point Elevation	190.3 m ASL
Aerodrome Elevation	191.5 m ASL
Aerodrome Magnetic Variation	12°W

3.3.1 Runways

The layout of the runways has a significant impact on the growth and development potential of the Airport both with respect to their capability and dimensions and with respect to the protective zoning areas (also known as obstacle limitation surfaces) required around the runway system as described below.

Runway 09-27

The primary Runway 09-27 has dimensions of 1,525m × 30.5 m (5000' × 100'). The runway is a Code 3C - Non-Precision (NP) facility with a paved asphalt surface. The runway includes a graded area width of approximately 60m (200') which provides a flat, obstacle free area in the event of an aeroplane running off the runway. The runway strip associated with Runway 09-27 is 150m in width, (75 m on either side of the runway centreline) and extends 60m beyond the runway thresholds.

Fixed objects are not permitted within the runway strip, except frangible visual aids required for air navigation purposes.

Although not declared in the aeronautical publications, Runway 09 has adequate land available to support a Runway End Safety Area (RESA) 90m in length, and 61m in width. Due to the presence of a ditch beyond the end of the runway strip supporting Runway 27, only 30.5m in RESA length is currently available. Declared distances used for aircraft runway performance calculations for Runway 09-27 are shown in Table 3-2.

Table 3-2 – Runway 09-27 Declared Distances

Declared Distance	Distance
Takeoff Run Available	5,000 ft
Takeoff Distance Available	6,000 ft
Accelerate Stop Distance Available	5,000 ft
Landing distance Available	5,000 ft

Obstacle Limitation Surfaces (OLS) are established for Runway 09-27 as shown in Table 3-3 which limit development and land use in the vicinity of the runway, and outside the Airport property boundary.

Table 3-3 – OLS Runway 09-27

Type	Description	09-27
Approach Surface	Length of Inner Edge	75 m
	Distance from Threshold	60 m
	Divergence	15%
	Length	3,000 m
	Slope	2.5% (1:40)
Transitional Surface Slope		14.3% (1:7)
Outer Surface	Elevation	235.3 m
	Dimensions	4,000 m



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Canada K2E 8C4
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Client



City of Peterborough

Title

SITE PLAN

Notes

1. Preliminary
2. All dimensions approximate

- Property Boundary
- Palge Wire
 - Deer Fence
 - Chain Fence
 - Flood Plain

Figure No.

3-1

Drawn By

HK

Approved By

RAM

Date

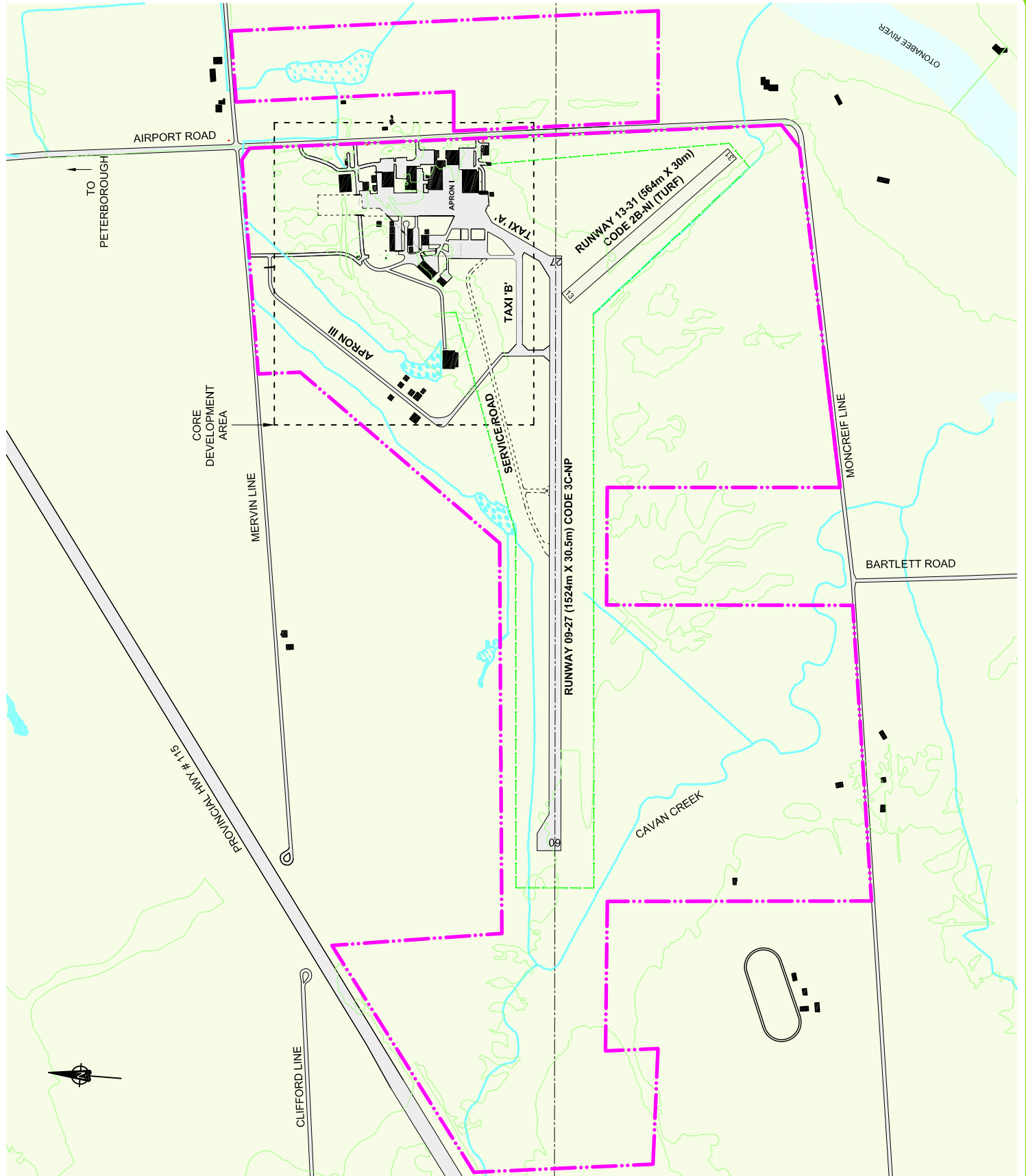
September 2009

Scale

N.T.S

Filename

AIRPORT H.K.



Runway 13-31

The secondary runway is Runway 13-31. This runway has dimensions of approximately 564m × 30.5m (1,850' × 100'). The runway is a Code 1B – Non-Instrument (NI) facility with a grass/turf surface. The graded area surrounding the runway has a width of 30.5m (100'). The strip associated with Runway 13-31 measures 30.5m in width, and extends 30m beyond the thresholds. Runways 13 and 31 do not have a RESA. Obstacle Limitation Surfaces associated with Runway 13-31 are identified in Table 3-4.

Table 3-4 – OLS Runway 13-31

Type	Description	13-31
Approach Surface	Length of Inner Edge	45 m
	Distance from Threshold	30 m
	Divergence	10%
	Length	2,500 m
	Slope	1:25
Transitional Surface Slope		14.3% (1:7)
Outer Surface	Elevation	235.3 m
	Dimensions	4,000 m

3.3.2 Taxiways

A series of taxiways connect the core area to the runway. Taxiway 'A' is 25 m in width and connects Apron I to the threshold of Runway 27. It is classified as Code C.

Taxiway 'B' begins at the edge of Runway 09-27 and connects to the edge of Taxiway 'A'. The pavement surface is approximately 15 m in width. This taxiway is also classified as Code C.

Taxiway 'C' connects the Airport's core area to a General Aviation (GA) development area. This taxiway has a width of approximately 8 m and is classified as a Code A facility, primarily supporting light General Aviation aircraft operations.

3.3.3 Aprons

The Airport currently includes one public apron according to the Airport Operations Manual (AOM).

Apron I is approximately 19,000 m² in area and is the Airport's primary apron. It served the former public Air Terminal Building (ATB), and currently serves the temporary ATB, and most aviation businesses and privately operated facilities. A Code C taxilane is provided on the apron running north-south to facilitate the movement and parking of aircraft.

The apron accommodates a variety of aircraft types including the Bombardier Regional Jet series, Bombardier Global Express, Cessna Citation X, and smaller aircraft.

Many airport tenants have private aprons connecting to Apron I and supporting combinations of the above aircraft types and even ultralight aircraft.

3.3.4 Air Navigation Facilities

Air navigation facilities generally provide increased airport availability, especially during periods of darkness, low visibility, and low cloud ceiling heights. Protective areas are required around each of the air navigation facilities identified herein, of varying dimensions depending on the equipment. Future developments must consider these protective requirements. The air navigation facilities currently installed at the Peterborough Municipal Airport are described herein.

Non-Directional Beacon

A Non-Directional Beacon (NDB) supports a non-precision instrument approach to Runway 09. This navigational aid is located approximately 3.7 nautical miles prior to the threshold of Runway 09, on the runway's extended centreline. The NDB approach provides a minimum descent altitude of 635 feet above ground, and can be used when visibility is above 2 statute miles.

RNAV/GPS

Non-precision instrument approach capability is also provided for Runway 27. An RNAV approach (which uses GPS satellites to aid navigation) allows an approaching aircraft to descend to a minimum descent altitude of 432 feet above ground, and has a standard visibility requirement of 1 ¼ statute miles.

Visual Aids

The Airport is equipped with the following visual navigation aids assisting airport availability during periods of darkness or low visibility:

- ✈ Aerodrome Beacon;
- ✈ Runway Identification Lights (09-27)
- ✈ High-Intensity Runway Edge Lighting (09-27);
- ✈ Precision Approach Path Indicators (09-27);
- ✈ Aircraft Radio Control Aerodrome Lighting; and
- ✈ Lighted Windsocks (3)

3.3.5 Aviation Service Facilities

Air Traffic Control

The Airport is not equipped with air traffic control (ATC) facilities. ATC services are provided remotely from Nav Canada's Toronto Area Control Centre (ACC) and do not include ATC services on, or in the immediate vicinity of the Airport due in part to a lack of low level radar coverage.

Flight Services

The Airport is not equipped with a Flight Service Station (FSS). Aircraft operators requiring flight planning services are required to contact Nav Canada's central Flight Information Centre (FIC) via telephone. The briefing service provides consultation on meteorological and aeronautical information in the pre-flight planning phases for the safe and efficient conduct of flight. The flight service specialist at the FIC adapts meteorological information, including satellite and radar imagery, to fit the needs of flight crew members and operations personnel, and provides consultation and advice on special weather problems.

Both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) flight planning services are provided by the FIC.

Aviation Weather

An Automatic Weather Observation System (AWOS) is located east of Taxiway 'A' and measures wind speed and direction, barometric pressure and temperature, and other atmospheric conditions.

The facility is used by aircraft operators to obtain current atmospheric conditions in METAR (Aviation Routine Weather Report) format, as well as a Terminal Area Forecast (TAF) which provides a description of the most probable weather conditions expected to occur at an airport, together with the most probable time of occurrence.

Aviation Communications

An Aerodrome Traffic Frequency (ATF) is currently provided at the Peterborough Municipal Airport.

ATFs are normally designated for active uncontrolled airports that do not meet the criteria for a Mandatory Frequency (MF) service. MF areas are established at an aerodrome if the traffic volume and mix of aircraft traffic is such that there would be a safety benefit derived from implementing MF procedures.

ATFs are established to ensure that all radio-equipped aircraft operating on the ground or within the vicinity of the aerodrome are listening on a common frequency and following common reporting procedures.

Persons possessing a valid radiotelephone licence and who are authorized to do so can communicate with pilots using two-way communication on the ATF to provide information such as; advice on the position of vehicles on the manoeuvring area, position of other aircraft on the manoeuvring area, and known runway conditions.

Nav Canada owns and operates a Peripheral Air-Ground Link (PAL) transmitter/receiver facility located approximately 455m southwest of the threshold of Runway 09. The PAL is located outside the Airport boundary. It provides direct controller-pilot VHF communications, primarily for IFR aircraft operating on nearby airways.

PAL facilities increase VHF radio coverage in enroute areas away from urban centres.

Aviation Support Facilities

Several aviation support facilities are available at the Peterborough Municipal Airport. The following support facilities are available as published in the Canada Flight Supplement (CFS):

- ✈ Aircraft Fuel Services including 100 Low-Lead (Avgas) and Jet A1 fuel sales;
- ✈ Aircraft Storage;
- ✈ Servicing/Minor Aircraft Repairs;
- ✈ Major Aircraft Repairs;
- ✈ Extended Term Aircraft Parking;
- ✈ Aircraft Tie Down Facilities; and
- ✈ Aircraft Plug-in Facilities

3.3.6 Passenger Facilities

Current passenger facilities at the Peterborough Municipal Airport are limited in nature. A temporary Air Terminal Building (ATB) is situated in the south end of the core area and supports airport administrative functions and itinerant aircraft arrivals and departures. Construction of a new ATB is expected to begin in the near future. The size and scope of the new ATB is addressed in Section 5.3.

Complete Aviation Services provides support including a passenger and crew lounge for business aviation activities at the Airport.

A full service Fixed Base Operator (FBO) facility should be considered as a potential part of the new ATB development and is addressed in Section 5.3.

3.3.7 Cargo Facilities

There are no dedicated cargo facilities at the Peterborough Municipal Airport. All cargo activities at the Airport are private, and occur on charter flights on an ad-hoc basis.

3.4 Land Use

Peterborough Municipal Airport occupies approximately 276 hectares of land within the limits of the Township of Cavan Monaghan and Peterborough County.

The site is zoned 'Airport' under the Township's land use By-laws.

3.4.1 Site Constraints

The Airport is constrained by many natural and some man-made features.

- ✈ The site is constrained by private properties directly to the north of the current airport boundary that are currently used for residential and agricultural purposes.
- ✈ Provincially significant wetlands are present within the Airport boundary to the north of Runway 09-27 and are also considered as a constraint to future development.
- ✈ Provincial Highway 115 is located west of the Airport.
- ✈ Airport Road lies directly to the east of the threshold of Runway 27; however, the Airport owns a parcel of land east of the road. Beyond this parcel of land lies a wooded area owned by a private land owner, followed by the Otonabee River which forms part of the Trent-Severn Waterway system.
- ✈ The Airport property is bordered by Cavan Creek and Moncrief Line to the south.
- ✈ On the western section of the Airport property lies Cavan Creek. Although within the limits of the current property boundary, this watercourse is considered as a constraint to future development due to its environmental sensitivity.
- ✈ Further to the west lies the interchange of Provincial Highways 115 and 28.

3.4.2 Current Airport Land Use Plan

A Land Use Plan was prepared in November 2006 (PSMI). The key objectives of the Plan were to:

- ✈ identify the optimal future Air Terminal Building (ATB) location;
- ✈ determine the long-term operational classification of Runway 09-27;
- ✈ identify land restrictions in the event the operational classification of Runway 09-27 were to be changed from Non-Precision to Precision;
- ✈ highlight the impact of increasing operational classification of Runway 09-27 on the existing Airport Federal Registered Zoning; and
- ✈ prepare a Land Use Plan clearly identifying the environmental constraints established by recent studies.

Several recommendations were made within the Land Use Plan in terms of future airport expansion. These recommendations were considered in developing the Master Plan and were followed when found to be appropriate.

3.4.3 On-Airport Land Use Regulations

The Township of Cavan Monaghan's By-law No. 2004-62 lists permitted land uses within the Airport property as described below. According to the regulations, all developments within the Airport boundary must adhere to the land use By-laws. However, since Transport Canada has jurisdiction over aerodromes, developments integral to aviation do not require approval from the Township (see Appendix E).

No person shall within any Airport Industrial (AR) Zone use any land or erect, alter or use any building or structure except in accordance with the following provisions:

6.4.1 Non-Residential Uses

- a) *an airport;*
- b) *airport related uses;*
- c) *a warehouse;*
- d) *a wholesale establishment;*
- e) *a forwarding depot or freight handling establishment;*

- f) *a contractor's establishment;*
- g) *an assembly plant;*
- h) *a manufacturing plant; and*
- i) *resource management Uses*

6.4.2 Regulations for Permitted Uses

<i>Maximum Lot Coverage</i>	<i>40%</i>
<i>Maximum Lot Area</i>	<i>0.5 hectare</i>
<i>Minimum Lot Frontage</i>	<i>60 metres</i>
<i>Minimum Front Yard Depth</i>	<i>15 metres</i>
<i>Minimum Rear Side Yard Width</i>	<i>6 metres</i>
<i>Minimum Rear Yard Depth</i>	<i>7.5 metres</i>
<i>Maximum Height of Building</i>	<i>12 metres</i>
<i>Minimum distance between any building and a public highway shall be 30 metres.</i>	

6.4.3 General Industrial Exception One (AR-1) Zone

6.4.3.1 Airport Exception One (AR-1) Zone

No person shall within any General Industrial Exception One (AR-1) Zone use any land or erect, alter or use any building or structure except in accordance with the following Provisions

- a) *Non-Residential Uses Permitted*
 - i) *an airport; and*
 - ii) *a forwarding depot or freight handling establishment.*
- b) *Regulations for Permitted Uses*
 - i) *Maximum Lot Coverage – 40%*
 - ii) *Minimum distance between any building and a public highway – 30 metres*
- c) *General Provisions*

All provisions, excepting maximum lot coverage and minimum distance between any building and a public highway, of Section 6, "Airport (AR) Zone", as they apply to the use of land, buildings or structures permitted in the Airport Exception One (AR-1) Zone.

An amendment was made to the By-law in 2005 which states that new structures within the Airport (AR) Zone have flood proofing to an elevation of at least 190.61 metres above sea level as the Peterborough Municipal Airport Lands are susceptible to flooding.

Whenever possible developments, not integral to aviation but recommended as part of the master planning process, should meet the requirements of the land use By-laws.

3.4.3 Vicinity Land Use

Land uses surrounding the Peterborough Municipal Airport are designated within the land use By-law administered by the Township of Cavan Monaghan.

- ✎ The parcels of land immediately to the north of the Airport boundary are currently designated as 'Rural'. These lands are generally used for agricultural purposes.
- ✎ Lands to the south of the current airport property are designated as 'Environmental' and 'Rural' areas, also used for agricultural purposes.
- ✎ Land uses immediately to the west of the Airport property are also designated as 'Rural'.

These are illustrated later in Figure 3-4

3.5 Airport Standards and Zoning

Certified airports in Canada are required to comply with national standards for airport activities and construction. All current operations and future planning activities must be based on adherence to Transport Canada's Aerodrome Standards and Recommended Practices (TP312). Compliance with these Standards is also mandatory in order to maintain the Airport's Operating Certificate.

Protection areas are established around certain airport components to protect the safety and security of aircraft operations. Depending on the nature of existing facilities and location of various topographical features adjacent to the site, other restrictions may also apply. These restrictions are summarized below.

3.5.1 Airport Physical Standards

A numeric Reference Code is assigned to airport facilities which classifies runways according to their length and, using a letter code, further classifies runways, taxiways and aprons according to the wingspan and outer main wheel span of the designated design aircraft.

In general, the higher the numeric or letter code, the greater the geometric requirements of the Airport become.

In addition, runways are classified according to their capability to support three types of aircraft flight approaches: Non-Instrument (NI), Non-Precision Instrument (NP), and Precision (P) instrument approaches. As approaches become more sophisticated for poor weather services, greater levels of protection are required.

Primary Runway 09-27 is classified as a Code 3C-NP Runway (1200m – 1799 m in length) Non-Precision Instrument facility, supporting aircraft within the Code C category and lower.

The Secondary turf Runway 13-31 is designated as a Code 1B runway, supporting Code B aircraft.

3.5.2 Physical Zoning

Physical zoning refers to the obstacle limitation zoning protecting airspace around the Airport which must be maintained free of obstacles. It defines the maximum height to which structures may be permitted. Zoning criteria are described in Transport Canada's Aerodrome Standards and Recommended Practices (TP312) and are based on runway reference codes described above. Each runway possesses its own physical zoning, depending on the reference code assigned.

Figure 3-2 illustrates both the Code 3C-NP and 2B-NI physical zoning requirements for runways at the Airport.

3.5.3 Electronic Zoning

Airport development and operations must also be compatible with a variety of electronic transmissions occurring on or near the Airport, all of which are critical to the safety of airport operations. Electronic zoning is designed to protect the integrity of the electronic systems of the Airport.

The zoning criteria are described in Transport Canada's document entitled TP1247 – Land Use in the Vicinity of Airports.

The Airport is equipped with several navigation aids and areas requiring protective zoning in the vicinity:

- ✈ a Non-Directional Beacon (NDB); and
- ✈ a Peripheral Air-to-Ground Link (PAL).

Figure 3-3 illustrates the current electronic zoning requirements stipulated by TP1247 necessary for protecting the integrity of the Airport's electronic systems from interference or disruption.

It should be noted that the protection requirements for the NDB are not shown as they occur entirely beyond the Airport property and do not directly affect airport lands.

While the PAL facility is also located outside airport property, key electronic restrictions extend over airport lands.

As Runway 09 and Runway 27 are not classified for Precision Instrument approaches, nor is this classification contemplated in the future, the need for additional protection for specialized electronic systems such as an Instrument Landing System (ILS) is not considered.

3.5.4 Vicinity Land Use Zoning

Physical zoning is not complete without protecting off-airport land requirements. Complete zoning plans usually include zoning regulations for obstacle limitation surfaces (OLS) including an outer surface consisting of a circular plane with a 4,000 m radius from the Airport Reference Point (ARP).

The Airport's airside system and surrounding airspace is normally protected by Federal Aeronautical Zoning Regulations. The Zoning Regulations prohibit the erection of any structure that may compromise unobstructed safe aircraft operations.

The maximum height of any structure is governed by its proximity to the runways, taxiways and any electronic or navigational aid equipment.

Most certified airports within Canada's National Airport System (NAS) have registered Federal zoning to protect land uses surrounding the Airport.

Although Peterborough Municipal Airport was not designated as an NAS airport by Transport Canada, registered zoning is currently in place and is entitled:

*Peterborough Airport Zoning Regulations
Regulations Respecting Zoning at Peterborough
Airport, SOR/94-123, Registered January 20, 1994.*

Off-airport land affected by these Regulations is annotated on the Land Title to alert owners of the restrictions. All airport development falling within the affected zones is subject to these restrictions and guidelines. The Regulations apply within airport boundaries through the Ground Lease, as if they had been registered against title.

These regulations may have to be revised if:

- ✈ Runway 09-27 is extended; and/or
- ✈ the classification is changed to Non-Instrument from Non-Precision.

Land uses surrounding the Airport property are also subject to the regulations presented in the Township of Cavan Monaghan's land use By-laws as indicated in Section 3.4.

Land use zoning surrounding the Airport is shown in Figure 3-4.



One Antares Drive,
Suite 250, Ottawa, ON,
Canada K2E 8C4
www.lpsaviation.ca

Client



City of Peterborough

Title

PHYSICAL ZONING

Notes

1. Preliminary
2. All dimensions approximate

Figure No.

3-2

Drawn By

HK

Approved By

RAM

Date

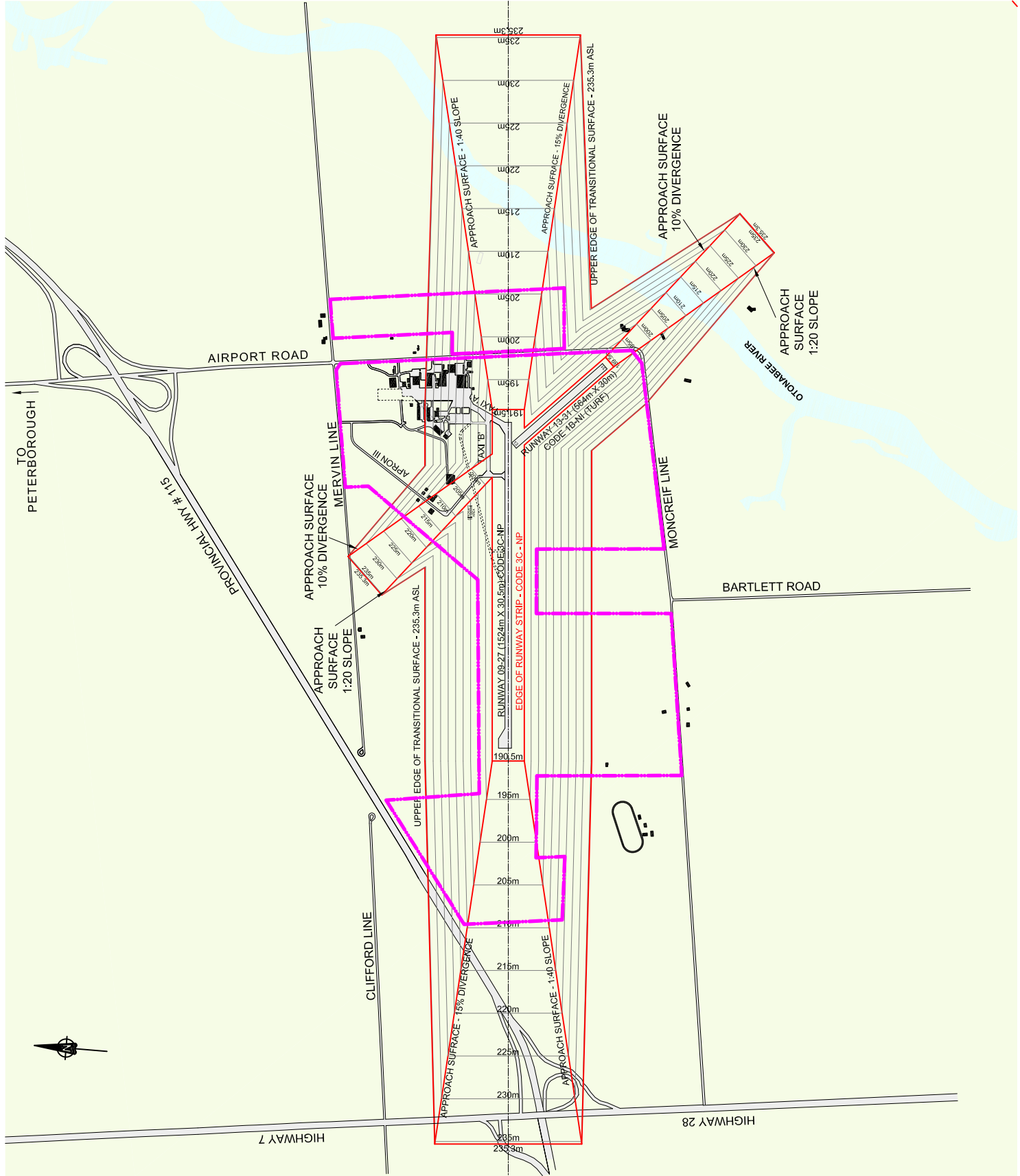
September 2009

Scale

N.T.S

Filename

AIRPORT H.K.





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Suite 250, Ottawa, ON,
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Client



City of Peterborough

Title

ELECTRONIC ZONING

Notes

1. Preliminary
2. All dimensions approximate

Figure No.

3-3

Drawn By

HK

Approved By

RAM

Date

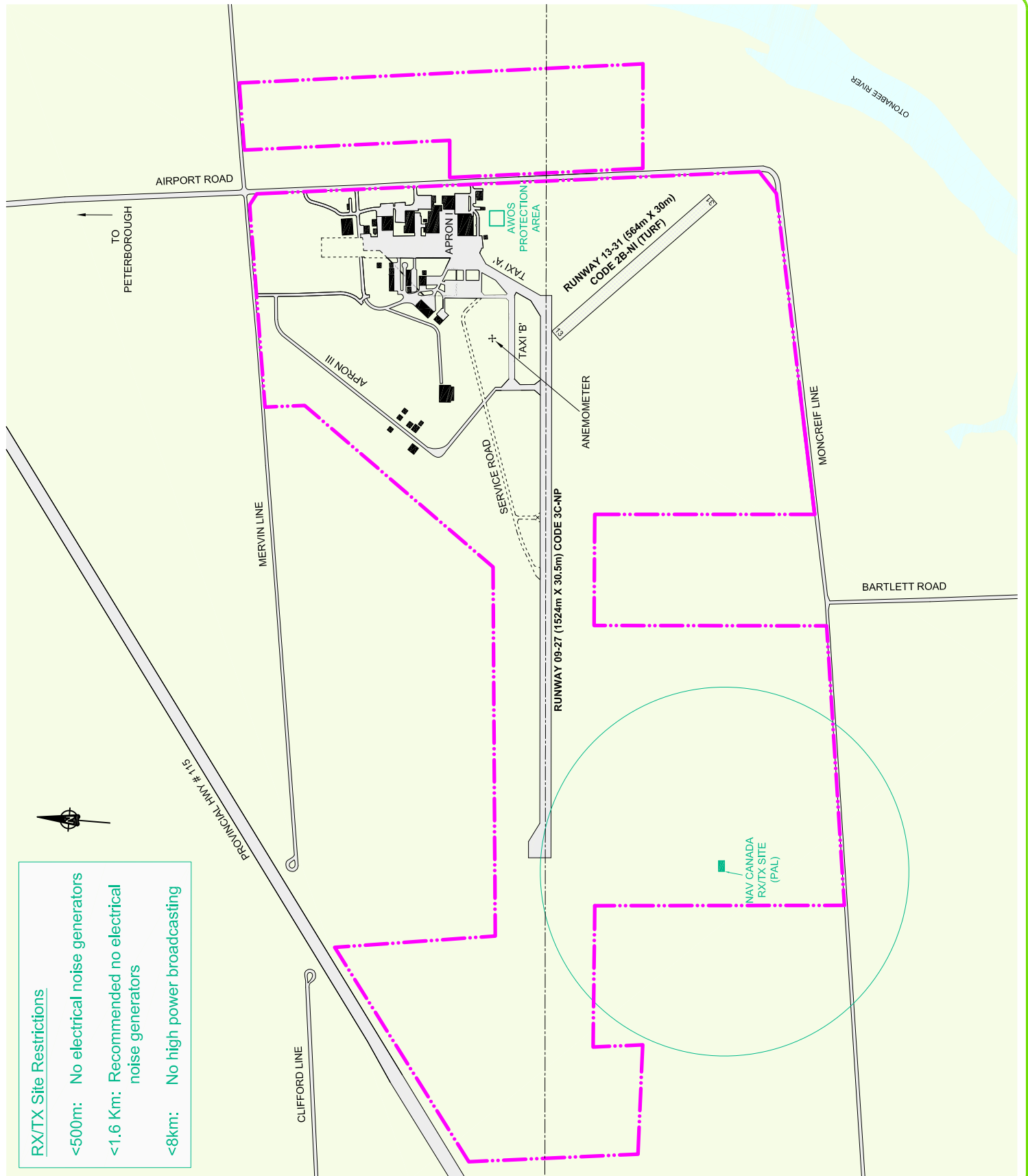
September 2009

Scale

N.T.S

Filename

AIRPORT H.K.





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Client



City of Peterborough

Title

VICINITY LAND USE ZONING

Notes

- Environmental
- Airport Property
- Golf Course
- Industrial Area
- Commercial Area
- Rural Area

Figure No.

3-4

Drawn By

HK

Approved By

RAM

Date

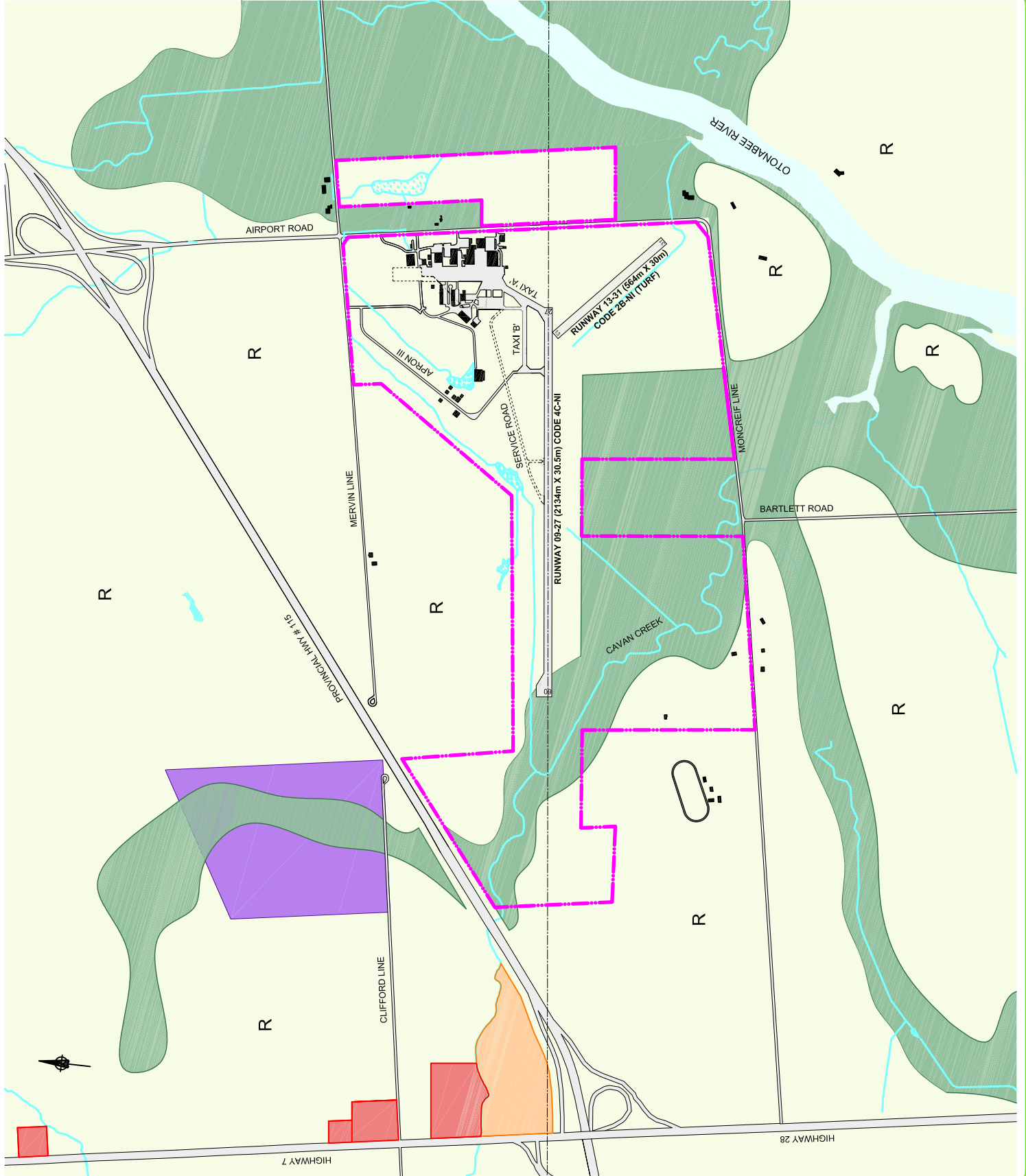
September 2009

Scale

N.T.S

Filename

AIRPORT H.K.



3.5.5 Noise Projections

One of the most significant environmental impacts of airport activity can be noise generated by aircraft landing or taking off at the Airport. In order to estimate the presence of potential noise impact on areas in the vicinity of airports, Noise Exposure Forecast contours (NEFs) are prepared based on the types of aircraft operating at the Airport and flight frequencies.

NEF contours are presented to measure the likely level of community response to aircraft noise.

Table 3-5 describes the NEF contour intervals and corresponding community response predictions as per Transport Canada's document TP1247 – Land Use in the Vicinity of Airports.

Table 3-5 – Community Noise Response Predictions

Response Area	Response Prediction
Over 40 NEF	Repeated and vigorous individual complaints are likely. Concerted group and legal action might be expected.
35-40 NEF	Individual complaints may be vigorous. Possible group action and appeals to authorities.
30-35 NEF	Sporadic to repeated individual complaints. Group action is possible.
Below 30 NEF	Sporadic complaints may occur. Noise may interfere occasionally with certain activities of the resident.

A noise exposure forecast was previously prepared as part of the Peterborough Municipal Airport Environmental Evaluation prepared by D.M. Wills Associates Ltd. and AirPlan Aviation Technical Services Inc.

The results are presented in Figure 3-5 and show the extent of the forecast NEF contours. These are based on a high traffic growth scenario, from which a representative peak day traffic distribution was calculated. The peak traffic was assumed to be primarily assigned to Runway 27 due to prevailing wind direction and historical runway use patterns.

The NEF contours presented in Figure 3-5 are conservative in nature as;

- ✎ some of the aircraft used in the model may now be considered outdated,
- ✎ new aircraft technologies are quieter;
- ✎ a quieter mix of aircraft is now expected in the future; and

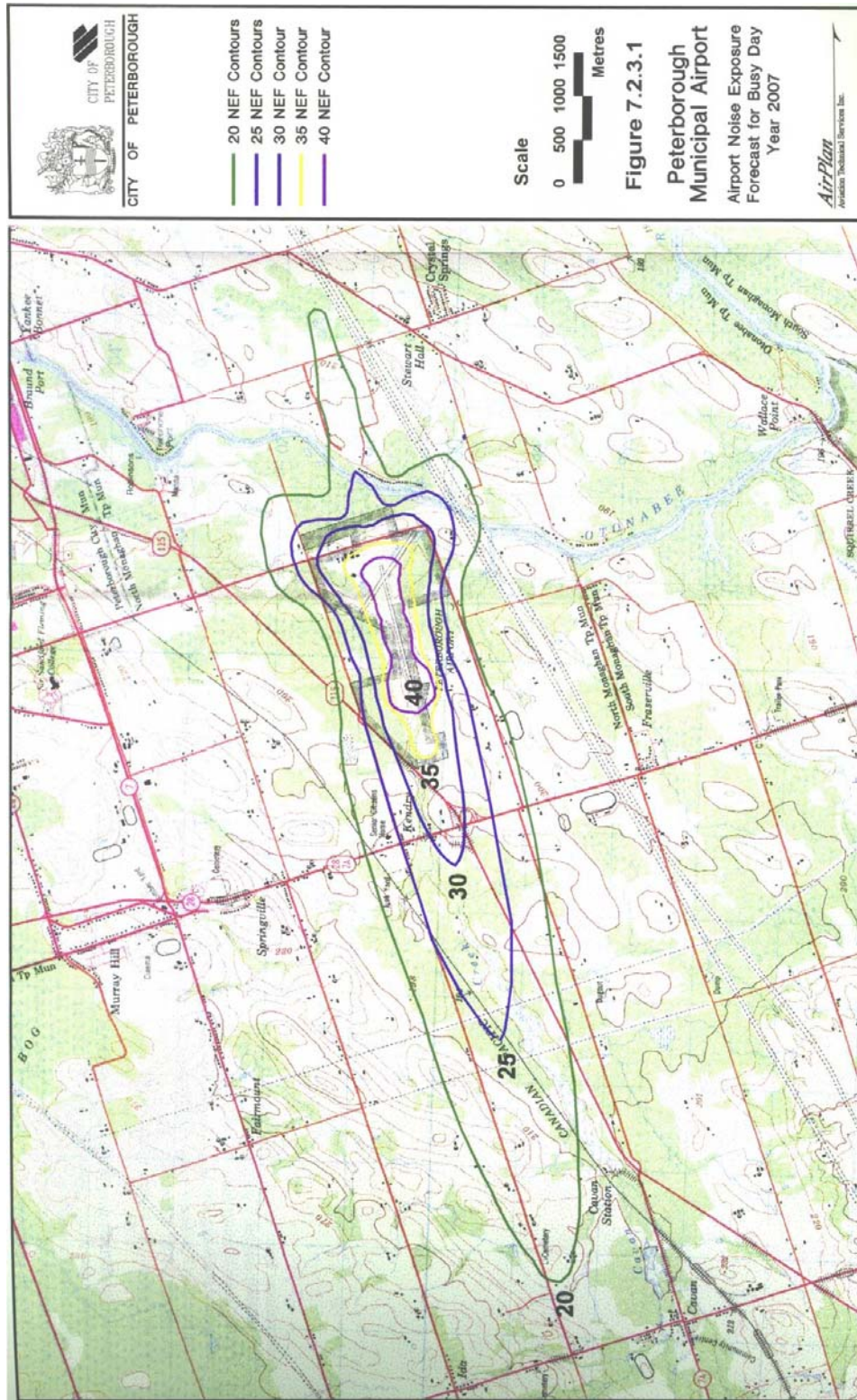
- ✎ a low frequency of flight operations is now expected under the new Business Case for the Airport, with few if any scheduled air services.

The foregoing factors would cause the NEF contours to decrease in area if the model were to be re-run. For the purposes of the Master Plan, the existing noise exposure forecast is therefore considered adequate. The arrival and departure of occasional larger aircraft will be sporadic, and could be limited to defined hours if necessary.

Review of the noise contours suggests that affected lands in the vicinity of the Airport are generally rural in nature, with a limited number of residential properties located in the Otonabee River valley below and potentially buffered from the Airport.

In the event scheduled air services were to develop successfully at the Airport, a new noise model forecast should be developed to guide future land use in the area.

Figure 3-5 – Noise Projections



3.6 Meteorological Assessment

Weather affects aviation and airport operations significantly. It is prudent to examine prevailing meteorological conditions to determine if any actions should be included in the master plan to improve the availability and/or usability of the Airport. There are many climatological, locational and geographic factors typically considered in an airport meteorological assessment.

The Airport is located to the south-southwest of the city centre, with the primary runway oriented in an east/west direction. The primary Runway (09-27) is paved.

Factors that affect the ability of a runway to meet its design needs are:

- ✈ ambient temperature (the higher the temperature the more runway length is required for the same aircraft);
- ✈ wind speed and direction (a cross-wind can affect the ability of aircraft to land);
- ✈ precipitation characteristics (snow and rainfall accumulations); and
- ✈ cloud ceiling and horizontal visibility.

Temperature

Based on more than 30 years of weather data accumulated at Peterborough, the daily average temperature ranges from a low of -8.9° C in January to a high of +19.4° C in July. With this modest range (compared to other airports in Canada) there is little variable effect on aircraft performance. In terms of average daily maximum temperature, the maximum is in July at 26.2° C and daily minimum values have been recorded in January at -14.1° C. There are only 7.24 days per year on average with a maximum high above 30° C where aircraft performance could be particularly poor.

The current runway alignment (Runway 09-27) and its supporting navigation systems are adequate for the types of aircraft proposed for the long-term and there is no need for runway modifications due to temperature.

Wind

The average wind speed varies from a low of 7.8 km/h in August to a high of 12.7 km/h in January.

An Airport Wind Rose based on 30 years of historical observations is presented in Figure 3-6. Predominate wind direction is from the west during the months from December through July. Predominate wind direction during other periods throughout the year is from the southwest.

At these average wind speeds and directions and with a runway oriented east/west, there should not be any significant cross-wind issues in terms of aircraft operations. Maximum wind speeds appear to occur from the west and southwest.

This closely reflects the direction of Runway 09-27 at the Peterborough Municipal Airport. Therefore, ***wind conditions should not restrict the type of operations proposed for the Airport.***

Precipitation

Rainfall in the Peterborough area is at a minimum in February with 21.9 mm per month and in August at a maximum of 83.2 mm. Snowfall is at a minimum of 0 cm in the period from June through September, while the maximum is in January at 40.7 cm. These are not considered as extreme accumulations of precipitation and the current runway structure (pavement, drainage etc.) has been reported by airport management to be sufficient, although flooding occasionally occurs during the spring melt. ***Precipitation is not a limiting factor in terms of current or contemplated airport operations.***

Visibility

Further analysis of ceiling height and usability during Instrument Meteorological Conditions (IMC) was also conducted to determine overall airport availability. Based on the current weather minima associated with current instrument approach procedures, airport availability could be limited. Data was collected for the period 1974-2005, and analyzed for ceilings and visibility categories. The period 0700-1300 Local Standard Time (LST) was the only period of continuous coverage, as the observation program terminated at various hours after 1300 LST during the period. There were 43,787 hours in the data sample.

The percent frequency of Below VFR ceilings and visibilities ranges from a high of 20.9 percent in January to a low of 7.5 percent in June. The trend is similar for the Below 800 feet and/or 2 mile visibility category. It peaks in January at 14.8 percent and drops to 4.9 percent in August.

The highest frequency for ceilings and visibilities in the Below 500 feet and/or 1.5 miles is in January at 9.1 percent with December very close in frequency. The lowest frequency for this category is in June at 2.6 percent. Figure 3-7 presents the results of the analysis.

Increasing airport availability by improving the instrument approaches could be difficult due to the future designation of Runway 09-27 as a Non-Instrument facility.

Transport Canada does not permit Non-Instrument runways to have instrument approaches published with decision heights of less than 500'. This suggests that when ceilings are below 500', the Airport will not be available which is approximately 6% of the time according to historical ceiling and visibility data.

If the runway were designated as Non-Precision decision heights could be reduced to 250' (assuming favourable results from a detailed approach design analysis). Runway strip requirements would have to be increased and physical zoning issues would present themselves, particularly related to the Flying Colors hangar development within the core area.

Further consideration of this issue is presented in Section 5.1.

Figure 3-6 – Wind Rose

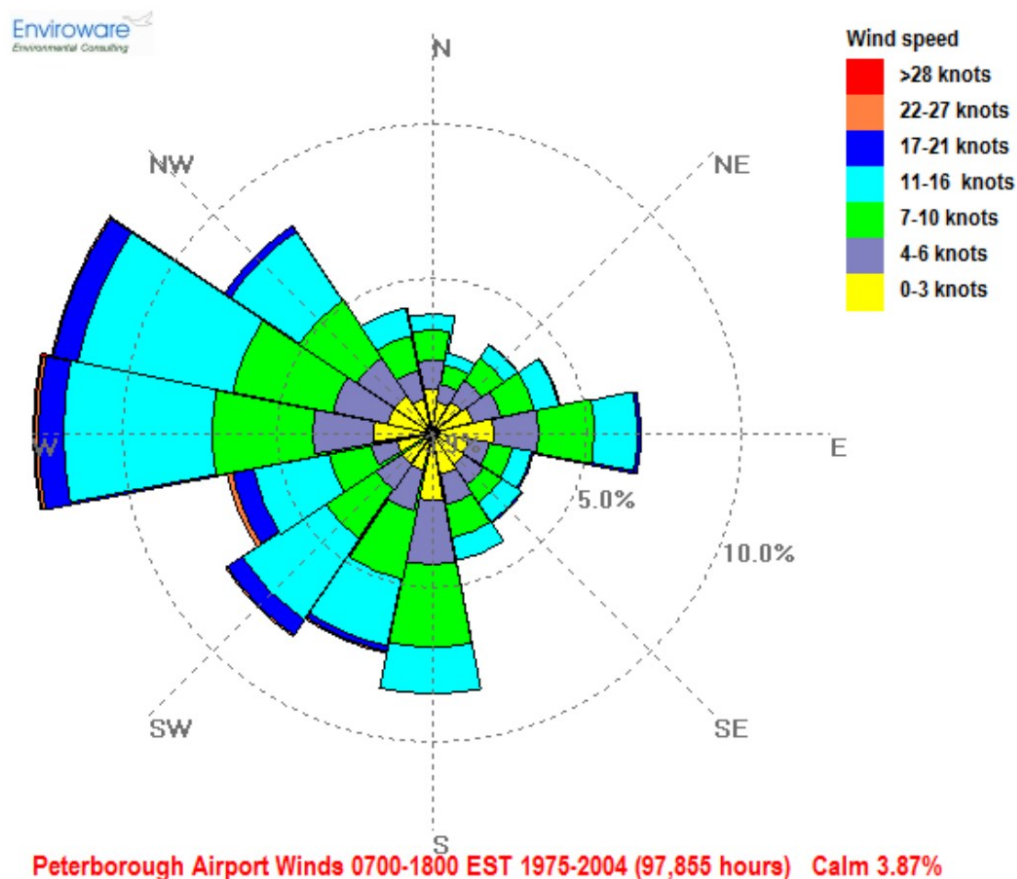
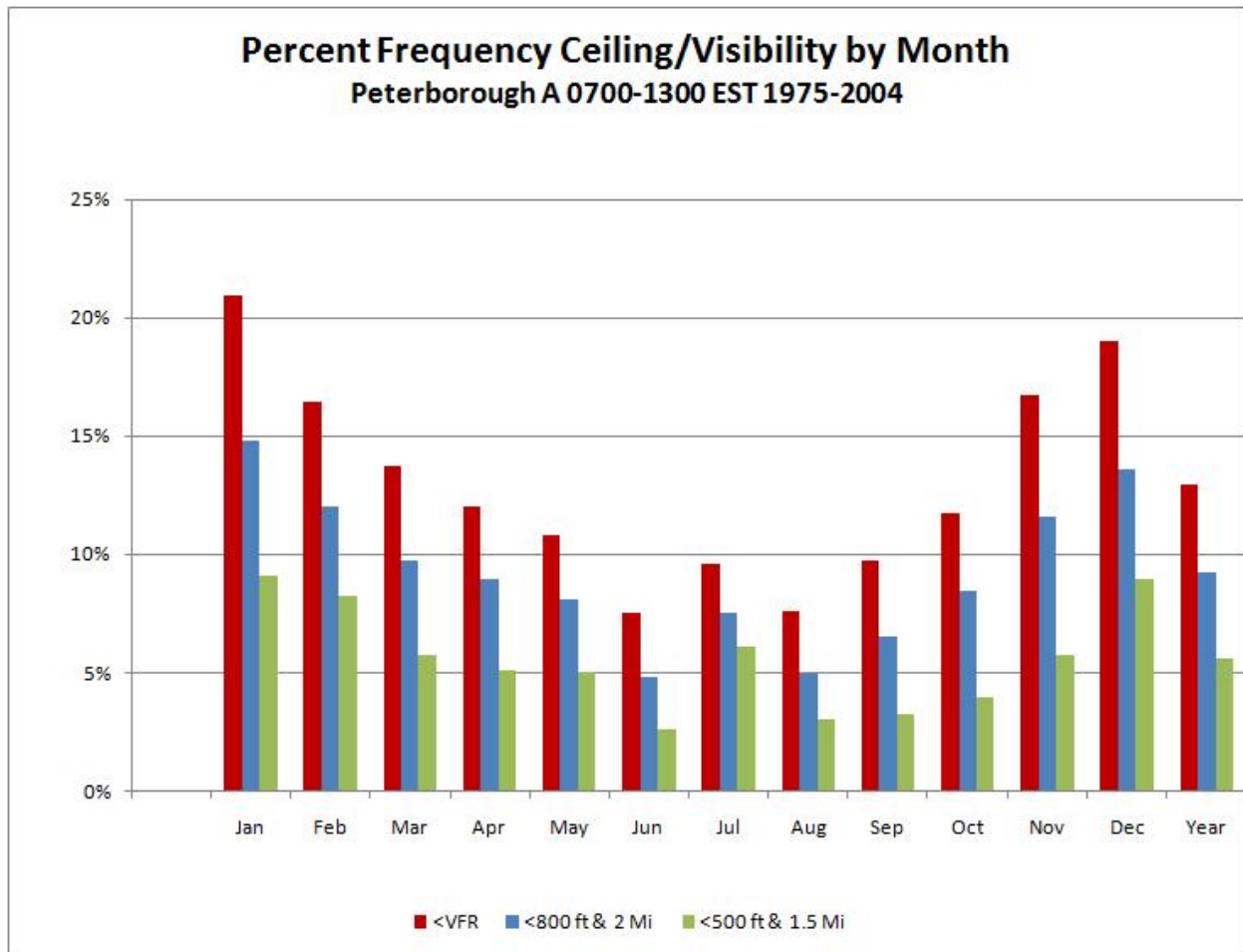


Figure 3-7 – Percent Frequency and Visibility By Month





4.1 Planning Horizons

The Master Plan considers requirements and development needs within stipulated time frames, or planning horizons. The following planning horizons are considered for the Peterborough Municipal Airport:

- ✈ Short-Term – 2009-2014 (5 years);
- ✈ Medium-Term – 2015-2020 (10 years)
- ✈ Long-Term – 2021-2031 (20 years); and
- ✈ Ultimate – Beyond 2031

This chapter summarizes the development of aircraft activity forecasts for the Peterborough Municipal Airport. The forecasts run to 2031 in annual increments. This two-decade interval is sufficiently long to permit the Airport to consider emerging trends in the community and the Canadian economy and to plan accordingly. The forecasts offer the framework within which to evaluate long term infrastructure investments. Many such investments have an economic life of one to two decades. The problems of estimating socioeconomic or aviation trends more than twenty years in the future would render forecasts for a longer horizon of little value or credibility.

4.2 Forecasting Approach

The forecasts of aviation activity at the Peterborough Municipal Airport consider general aviation, scheduled passenger services, charter passenger services, and all-cargo flights.

Although all sectors are relevant to planning at the Airport, only General Aviation has had significant activity in recent history. The forecasting approach therefore emphasizes General Aviation, with movements (landings and takeoffs) as the unit of measure.

The term “General Aviation” refers to a very diverse mix of activities – corporate flying for top executives, small aircraft charter flights, pilot training, air ambulances, prospecting, forest fire fighting, banner towing, aerial sightseeing, non-scheduled services to remote camps, mines, and resorts, natural resources management, crop spraying, heavy lift helicopter services, and civil and military government activity.

A common definition of general aviation is that it encompasses all flight activity except air services by large aircraft operating on a unit-toll¹. It thus excludes scheduled services². The sector is therefore defined most commonly in terms of what it does **not** include. Canadian aviation statistics divide general aviation into four segments:

Other Commercial

This definition includes any flights hired for commercial purposes. The operator holds a license issued by the Canadian Transportation Agency and receives compensation at arm's length from the entity hiring the flight. This category includes some passenger and cargo charter flights, pipeline inspection, prospecting, crop spraying and many other activities. Statistics Canada defines this category by default as any commercial operation that does not include carriage of passengers or goods on a unit toll basis. Until 1991, this category included many scheduled flights. Published databases still suffer from the wrongful inclusion of scheduled flights in reported general aviation totals.

¹ “Unit Toll” services are available to travelers and shippers at large. They operate according to published rates, and each user of the service pays according to the quantity of the service (e.g. per seat, per tonne-mile, etc.) used.

² The Canadian definition of aviation does include some services of small charter aircraft in the “Other Commercial” of general aviation

Private

Private flying involves any operation in which the entity that benefits from the flight also owns the aircraft. Recreational flyers who own their own aircraft and corporate aviation departments are the most common generators of “private” operations statistics.

Civil Government

This category includes any flight undertaken by a civil governmental organization. Common applications include transportation of senior government officials and police operations such as enforcing speed limits. Operations by the Ministry of Natural Resources (MNR) such as aerial fire fighting, fall into this category.

Military

This category includes operations by Canadian and foreign national defence forces.

Statistics Canada reports annual flight operations by airport in the publication 51-210 “Aircraft Movement Statistics.” The document includes scheduled and charter flights of large passenger and cargo aircraft. One category covers carriers in Groups IV-VI. These companies generated less than \$1 million in each of the two years preceding the report. They operate small aircraft charter services to points throughout Canada (including Peterborough), many of which lack scheduled services. This segment is sufficiently large at Peterborough to justify formal modelling.

A separate column in the report lists local movements at each airport, but does not include any breakdown according to the other commercial, private, civil government, and military classification system. Local movements consist mostly of training flights.

The definitions operate on the basis of who owns the aircraft, rather than the purpose of the flight. A flight conveying senior corporate executives would be classified as “Other Commercial” if the aircraft is chartered, and “private” if owned by the company. Recreational flying is classified as private. Flights serving resource industries (e.g. prospecting or pipeline inspection) could also be classified as “other commercial” or “private.” The Statistics Canada document reveals little about the underlying purpose of the flight.

4.3 Economic Outlook

Aviation activity is affected by economic factors operating throughout the nation and the world. Activity at a specific airport also reflects many community-specific elements. High volume scheduled passenger and cargo services respond quickly and strongly to any economic weakness. The link between general aviation activity and the economy, while still significant, is weaker. Factors specific to the community often exert the strongest role in determining flight operations.

Macroeconomic Factors

The worldwide economic crisis that began in late 2007 will have a profound and continuing impact on the Peterborough region and the Canadian economy. In the United States, the cumulative job losses now exceed the net job creation of the last nine boom years. This is the first contraction since the Great Depression to destroy all employment growth from the previous peak in the business cycle.

The U.S. sub-prime mortgage crisis has greatly weakened the household sector. Many households must now rebuild their wealth, and have reduced consumption accordingly. This high household savings rate, reinforced by mounting unemployment, will not reverse quickly. It will delay any recovery. From 2001 until the crisis emerged in 2007, household consumption, based on low interest rates and appreciating property values, was the primary force driving the U.S. expansion. Spain, the United Kingdom and Ireland also experienced a rapid appreciation in housing prices, followed by a steep decline that began in 2007.

Households are the basic building blocks of the economy, and fundamental problems of wealth have percolated throughout the goods sector and the financial system. Financial markets treated mortgages, including risky sub-prime agreements, as tradable assets, and sold complicated combinations of individual mortgages throughout the world. These trades have helped spread the problems afflicting U.S. real estate markets to other nations and industrial sectors.

As illustrated by the failure of CIT Financial Group in July, 2009 the financial crisis is still evolving. It could have a particularly important, but delayed, impact on foreign exchange markets. The U.S. dollar will in the short run benefit from reduced imports, the result of reduced household consumption. However, the large U.S. dollar holdings of foreign governments could create instability. Many countries are concerned that the United States will inflate its currency to reduce the national debt and finance the large stimulation programs. Any move away from the U.S. dollar as a medium of exchange will create large uncertainties throughout the world. The U.S. dollar would depreciate. The Federal Reserve would likely respond to the weakened U.S. economy with low interest rates, which would further encourage a cheap Dollar.

Canada has avoided the worst of the housing market excesses, and its financial institutions hold relatively small quantities of toxic financial assets. However, its strong linkages with the United States will suppress growth for much of the next decade. The Canadian dollar will appreciate as energy and commodity prices increase, driven by decreasing supplies of conventional petroleum and the economic recovery in Asia. Canadian manufacturers will be less competitive as exporters, and will experience stronger competition from imports. Consumer markets in the United States will remain weak. Strong commodity prices will help western Canada, and growing resource industries will create large demands for labour. Canada's economy will increasingly emphasize the extraction and export of raw materials. After 1980, Canada's economy shifted away from primary commodities extraction, and towards knowledge-based services and advanced manufacturing. This trend will be reversed by a weak U.S. economy, a strong Canadian dollar, and high commodity prices.

Ontario has the closest links of any province to the United States. The appreciating dollar, weak U.S. consumption and the problems facing the Detroit Three automobile manufacturers will lead to a sluggish manufacturing sector. Ontario's strengths include a robust services sector, relatively high quality infrastructure and a well diversified economic base. Although it faces a difficult decade, these advantages will help it maintain acceptable but unremarkable growth.

Airlines are very sensitive to economic contractions. The severe declines in traffic and fares experienced worldwide will likely cause business failures in the fall of 2009 and the winter of 2009/2010. The demand for pilot training will fall. Corporate aviation departments will be under pressure to cut costs, and some business travel will shift from small aircraft charters and company-owned aircraft to scheduled commercial flights. Medical evacuation services should not be greatly affected.

The current crisis has centered on households and the housing market. It developed at a very grass roots level of the economy. Considerable time will be needed to restore family finances and revive consumption. In previous recessions, the economies of different countries have declined at different times and different rates. Some large nations avoided any contraction altogether. The current slowdown is remarkable in its worldwide extent and the close synchronization of different economies. This crisis has seen widespread damage to financial institutions. It poses especially difficult, and unresolved, problems in the international monetary system. There are no precedents to these conditions, making predictions especially difficult. Table 4-1 highlights the differences in the expectations about the near term growth of Canada's Gross Domestic Product (GDP).

The traffic forecasts for the Peterborough Airport assume a relatively weak economy. While the summer of 2009 saw many mentions of "green shoots" and predictions of the quick recovery, the unique attributes of the current slowdown point to a sluggish and lengthy recovery lasting much of the next decade. The United States will likely lag the rest of the world. The activity forecasts reflect this pessimism. Appendix A summarizes the macroeconomic assumptions for the forecasts of traffic at the Peterborough Airport.

Regional Factors

The future of the Peterborough Municipal Airport depends partly on the community's relationship to the Greater Toronto Area (GTA). Peterborough offers its residents a high quality of life and considerably lower costs than the GTA. As the GTA urban complex expands to the east and northeast, it will exert a growing influence on Peterborough. Peterborough can expect an influx of residents.

Table 4-1 – Forecasts of Real Canadian GDP Growth, 2009-2010
Current Forecasts, July 2009

Source	2009	2010
Bank of Canada	-3.0%	2.5%
Bank of Montreal	-2.2%	1.8%
Bank of Nova Scotia	-2.2%	2.5%
Canadian Federal Budget, 2009	-0.8%	2.4%
Canadian Imperial Bank of Commerce	-2.2%	1.5%
International Monetary Fund	-2.3%	1.6%
Royal Bank of Canada	-2.4%	2.5%
The Economist	-2.9%	0.9%
Toronto Dominion Bank	-2.4%	1.4%

Some companies may locate in Peterborough rather than Toronto, in the same manner that many firms have located their head offices in Markham, Kitchener-Waterloo and Burlington. The persons involved will likely have relatively high incomes and propensities to travel. The companies will be focused towards field offices and markets throughout Canada and elsewhere.

These processes will stimulate all forms of air traffic growth at the Airport. While Peterborough remains too distant of the GTA to become a mere dormitory community, the community will increasingly function as part of the large urban entity.

The recent extension of GO Transit bus services to Peterborough would accelerate the economic interaction of the City with the GTA complex. The original Montreal-Toronto line of the Canadian Pacific Railroad served Peterborough. However, the railroad downgraded and eventually abandoned most of the line, retaining the Havelock-Peterborough-Toronto tracks to serve online businesses. Havelock-Peterborough-Toronto passenger train service continued until 1981.

The community has long expressed an interest in restoring the trains, either through VIA Rail or GO Transit. However, planners have raised many concerns about capital costs and ridership levels. Metrolinx, the government body overseeing urban transit for Greater Toronto, has begun a detailed evaluation of the proposal, to be complete in the fall of 2009. The Federal and Provincial governments have agreed to provide funding, contingent on the results of the study. A GO bus service from Oshawa to Peterborough will begin in the fall of 2009.

The bus would help build patronage for a commuter train. Plans to extend Highway 407 to the east of the GTA would also accelerate the integration of Peterborough into the GTA complex.

The regional population is an important determinant of general aviation activity. The Government of Ontario Ministry of Finance produces forecasts of regional population as part of its annual budgeting process. The econometric models base their aviation forecasts partly on the government population forecasts, shown in Appendix B.

4.4 Passenger Traffic

4.4.1 Scheduled Services

In the early 1980s, Air Otonabee, a Peterborough-based operator, provided scheduled services to Montreal, Ottawa and Toronto.

Mr. V. Pappalardo acquired the company in 1984 and relocated its base to the Toronto City Centre Airport. The company, was renamed as City Express, and operated a shuttle service to Montreal, Ottawa and Newark. It ceased operations in 1991.

Whatever the fate of the Pickering Airport, the forecasts do not assume any restoration of scheduled passenger services at Peterborough. While the community has sufficient traffic to support a basic scheduled service³, the Airport cannot match the benefits of Pearson Airport. Whatever services Peterborough could support, Pearson could offer more frequencies, a wider range of carriers and larger aircraft (implying lower fares). These benefits more than offset the longer driving times to Pearson.

A scheduled commuter service to Pearson would offer a wide range of onward connections. However, the operating costs, which depend on both flight time and the number of landings and takeoffs, would be very high in relation to the distance. The number of daily flights would have to be very large to offer the same flexibility as surface transportation.

A small 19 seat turboprop aircraft might operate a minimal service to Ottawa or Montreal. It would compete primarily with surface transport. This operation would be similar to Bearskin Airlines' 3/day flights between Ottawa and Kitchener/Waterloo.

³ A cross-sectional model expressing a community's scheduled traffic in terms of its population and income suggested that the Peterborough Region; comprising Peterborough, Kawartha Lakes, Whitby, Oshawa and Clarington; generates 730,000 passengers per year. This corresponds to 1,000 outbound and 1,000 inbound passengers per day.

However, the Kitchener/Waterloo area has a larger population (451,235 versus 116,570 for Peterborough⁴), many technology-intensive firms such as Research in Motion, and a longer travel distance than from Peterborough. In 2008, Air Canada Jazz abandoned efforts to establish flights between Hamilton (population 692,911) and Ottawa/Montreal.

Many small airports have lost scheduled services. The 30-70 seat aircraft that serve low volume airports have high operating costs. They are increasingly unprofitable in a fare-sensitive industry, in which prices are rendered virtually transparent by the internet. As airlines use successively larger aircraft, many small communities will lose air services. Airports that currently lack scheduled services will find it increasingly difficult to attract a carrier. Throughout North America, there are very few communities of a population similar to Peterborough's, and as close to a major scheduled airport as Pearson, that continue to receive scheduled services.

4.4.2 Passenger Charter

Many Canadian cities have seasonal charter flights to the U.S. Sunbelt, the Caribbean and Mexico. A longer and stronger runway at Peterborough could support direct flights to many popular destinations. However, the population of Peterborough, Oshawa and surrounding areas is not sufficient for a service of this nature.

A weekly flight, operating for five months each year and carrying 140 passengers would account for a yearly volume of 5,600 passengers. The flights would compete with the much more extensive offerings at Toronto Pearson. The charter service would require a suitable terminal and ramp, with inspection services by the Canadian Air Transportation Security Administration (CATSA) and the Canadian Border Services Agency. The limited volumes of traffic would likely require the inspection staff and airline employees to be brought in from elsewhere, significantly raising the costs of the operation.

⁴ Source: Statistics Canada community profiles for the respective Census Metropolitan Areas.

The flights would raise the Airport's profile in the community, but would not make a large economic contribution. The forecasts therefore do not include sunspot charter services because the potential volumes are small in relation to the required investments.

Small aircraft charters will continue to use the Airport. Corporate passengers will use chartered or company-owned aircraft to visit the Peterborough region.

4.5 Cargo

4.5.1 Current Activity

Peterborough Municipal Airport has historically accommodated cargo aircraft serving the General Motors plant in Oshawa. In 2003, it handled a very modest 3.5 tonnes of air freight, and 29.8 tonnes and 7 tonnes in 2004 and 2005, respectively.⁵ The true volumes are likely much larger, because the Statistics Canada reports exclude many charter and integrated carrier services.

4.5.2 Future Projections

The forecasts do not call for significant cargo traffic at the Peterborough Municipal Airport.

Small aircraft will continue to visit the Airport for both passengers and cargo. An integrated carrier such as FedEx or UPS could operate a turboprop aircraft to a hub in Toronto or Hamilton to carry high priority courier traffic. These airports are sufficiently close to Peterborough to permit the much cheaper alternative of trucking. However, should surface congestion threaten timely deliveries, operators might consider air transport. Both the Oshawa and Peterborough airports would be candidates for all-cargo services.

⁵ Source: Statistics Canada Report 51-203 Air Carrier Traffic at Canadian Airports, Ottawa

4.6 General Aviation

4.6.1 Current Activity

Appendix C lists historical General Aviation (GA) activity for 1996-2008. Figure 4-1 summarizes the results of this table.

Figure 4-1 highlights the importance of local movements to the Airport. This traffic has been very volatile. The difference between peaks and adjacent troughs frequently exceeded all other types of aviation combined. Local movements primarily involve flight training, and any changes in the Airport's flight school activity can have a pronounced impact on total traffic.

Other types of flying accounted for limited activity. During 1996-2008, no other sector ever generated an average of even ten operations per day, or five landings and five takeoffs, in any given year.

The levels of activity are so small that random variations overwhelm any long term trends. Over the 1996-2008 interval, no underlying statistical trends were apparent. None of the series showed any meaningful relationship with real Gross Domestic Product, Gross Capital Formation, Personal Income, Price of Aviation Gasoline, Investment in Non-residential Structures or any other macroeconomic variables.

This behaviour is common for general aviation at most airports. General aviation tends to be influenced, less by macroeconomic variables than by local events, such as an operator's purchase of an aircraft, new mineral exploration activity, a local company's decision to purchase a corporate aircraft, or the expansion or closing of a flying school. This granularity often defeats macroeconomic-based models.

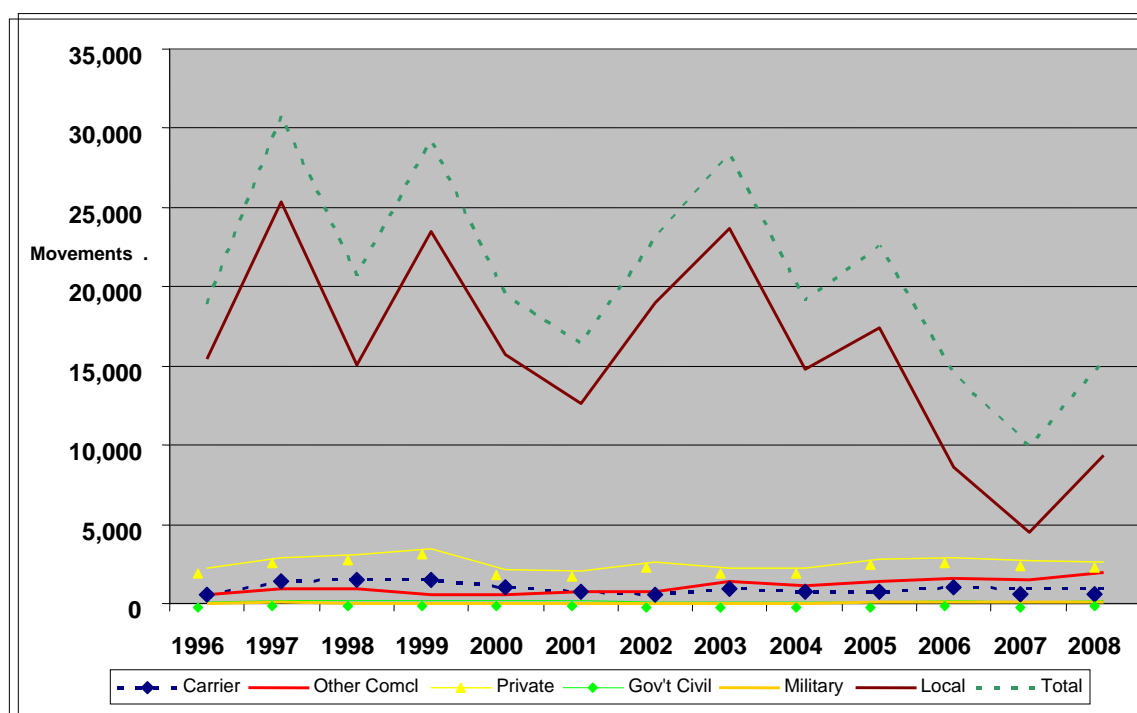
A second estimation problem is that general aviation has been declining nationally for decades. Between 1996 and 2007, the four major categories together fell by 13.7 percent⁶. At some airports, any trend, time series or regression analysis predicts that the sector will disappear altogether.

⁶ Source: Statistics Canada, Aircraft Movement Statistics

The very large economic value of many general aviation operations, the long term need for airline pilots, and the efficiency of aircraft in many resource-oriented activities renders this finding counter-intuitive.

The complexity of GA and the unique factors driving it at each airport pose complex modelling problems. Section 4.6.2 summarizes the process for developing forecasts of GA at Peterborough Municipal Airport.

Figure 4-1 – Historical GA Activity – Peterborough Municipal Airport



Source: Transport Canada TP577, Statistics Canada 51-210 "Aircraft Movement Statistics."

4.6.2 The Modelling Process

None of the sub-sectors of GA generated plausible models when compared to time series⁷ of

⁷ Two broad approaches are available for many statistical modelling applications. The "time series" approach considers activity at Peterborough over a lengthy period, at least a decade. The models relate changes in the Airport's activity over the period to corresponding changes in GDP or other variables. The "cross sectional" approach considers a sample of several communities in one time period. The resulting model relates each community's general aviation activity to its population, average personal income, and other factors. Each approach poses distinct estimation problems.

socioeconomic variables. The statistical "fit," as measured by the F-statistic or r-square, was invariably poor. The failure of the time series approach called for a different methodology. A cross-sectional model provided plausible coefficients and forecasts. The model uses a sample of 47 Canadian airports, some with control towers and others with flight service stations. The sample excludes large, multi-airport communities of Vancouver, Calgary, Edmonton, Winnipeg, Toronto, Ottawa, Montreal and Halifax.

All members of the sample are located in the southern half of Canada, and have effective ground transportation services.

For each community, the data includes the level of activity for each type of general aviation, local movements, and Level IV-VI carrier operations. Statistics Canada's Community Profile listed the 2006 population, area and average personal income for each community. Some airports serve several communities. Examples include the Castlegar Airport, serving its namesake community, Nelson, Trail and Creston.

The population corresponding to the Peterborough Airport includes the Peterborough and Kawartha Lakes Census Metropolitan Areas. The data was aggregated accordingly. Although the model includes only cities classified as part of southern Canada, some points lie on the peripheries of large wilderness areas. A 0/1 variable captures these instances, and reduces the distortion of a heterogeneous sample.

The forecasts produced estimates of the traffic levels at the Peterborough Municipal Airport that are commensurate with the community's population and per capita income. In all instances, the actual traffic was well below the expected values produced by the regressions. The forecasts incorporate the view that improvements in facilities and development of nearby industrial properties will raise the Airport's profile and attract new activity. The traffic will therefore grow from increased economic activity in the area, population growth, and a further process that reflects the expansion of traffic from its current value to what it "should" be, given the regional fundamentals.

The data provides no evidence on the length of the adjustment process. The forecasts assume a 10 to 30 year duration, depending on the magnitude of the disparity.

4.6.3 Buttonville Airport

As one of the closest, and certainly the busiest competitor GA airports, the future of Buttonville Airport may have a significant impact on Peterborough Airport. Buttonville is the primary GA facility for the GTA and faces ongoing uncertainty.

Most significantly, Transport Canada and the GTAA recently ceased providing the Airport with an annual

operating subsidy which was provided to ensure GA traffic had a viable alternative to Pearson Airport. This helped alleviate congestion at Pearson Airport from smaller aircraft. At this time, reinstatement of the subsidy appears unlikely.

Buttonville, once constructed in largely rural surroundings, now lies within a heavily urbanized area. The Town of Markham and other locations surrounding the Airport have experienced among the fastest population growth in the GTA. The area has become a popular site for large corporate offices. The changing patterns of land use have caused the value of the Buttonville Airport land to appreciate dramatically. Conflicting land uses pose a growing problem, and the Airport faces growing restrictions on aircraft noise.

Flight schools face growing problems at Buttonville. The busy airport and airspace often require training flights to queue for the runways. Students pay for their training flights by the hour, making Buttonville courses expensive.

The Medium and Low forecasts for Peterborough assume no change in flight operations at Buttonville. The High Case assumes that some local training flights at Buttonville will shift to Peterborough. Starting in 2013, the forecasts assume that Buttonville's local flight operations will reach a plateau. Each subsequent year's local operations growth will shift to either the Oshawa Airport or Peterborough. The proportion will depend on the relative populations of the catchment areas of the two airports. A high population in Oshawa or Peterborough will result in a proportionately high number of student pilots. A large population will also suggest a strong attraction, and a wide range of available accommodations for foreign students.

4.6.4 Future Projections

Appendix D displays detailed forecasts for the Medium, Low and High cases.

Figures 4-2 through 4-7 display forecasts for each category of operations.

Figure 4-2 – Carrier Class IV-VI Operations Forecast – Peterborough Municipal Airport

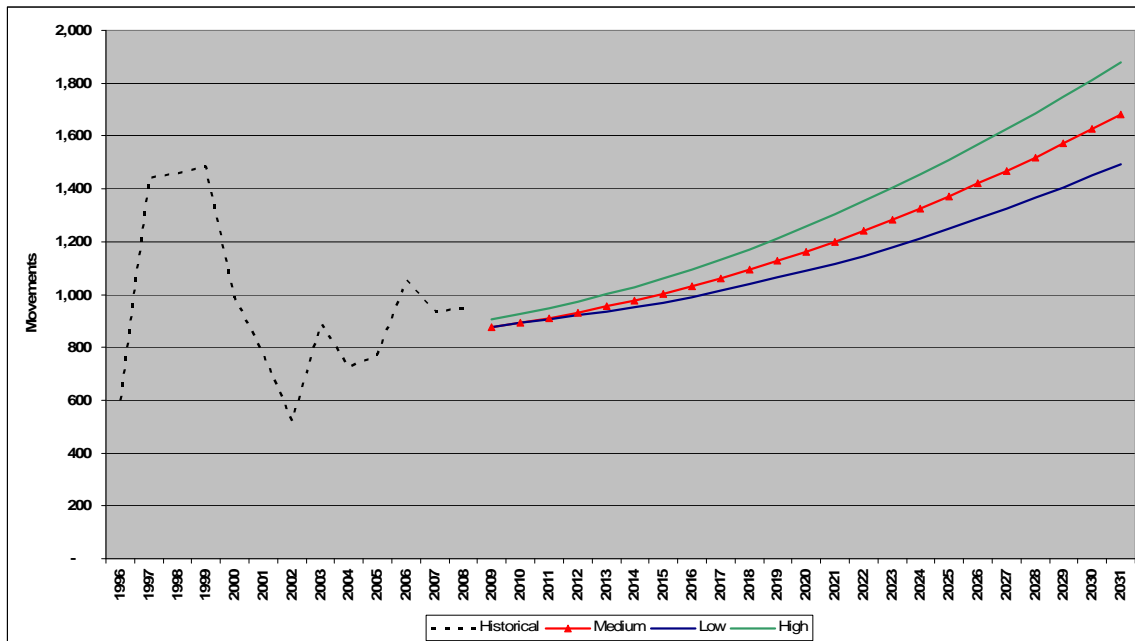


Figure 4-3 – Other Commercial Operations Forecast – Peterborough Municipal Airport

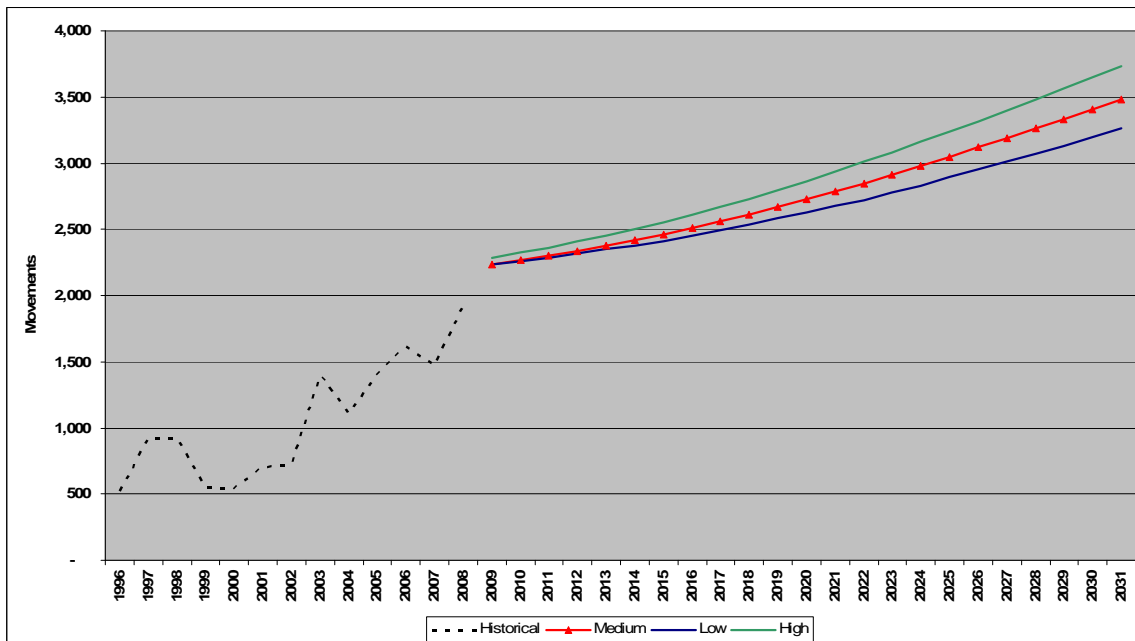


Figure 4-4 – Private Operations Forecast – Peterborough Municipal Airport

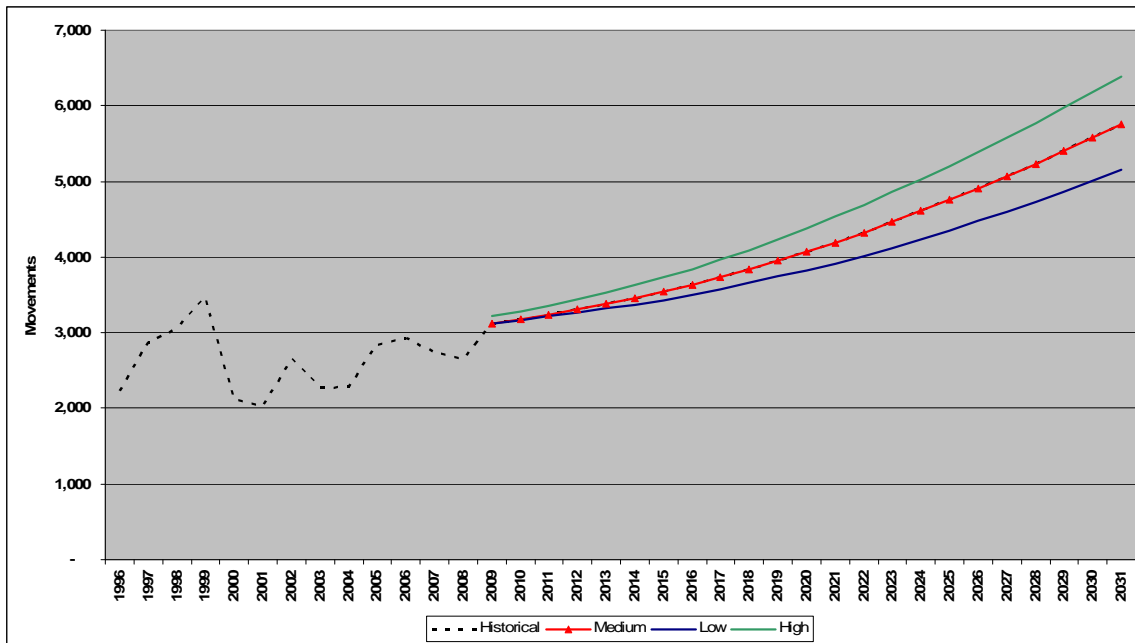


Figure 4-5 – Civil Government Operations Forecast – Peterborough Municipal Airport

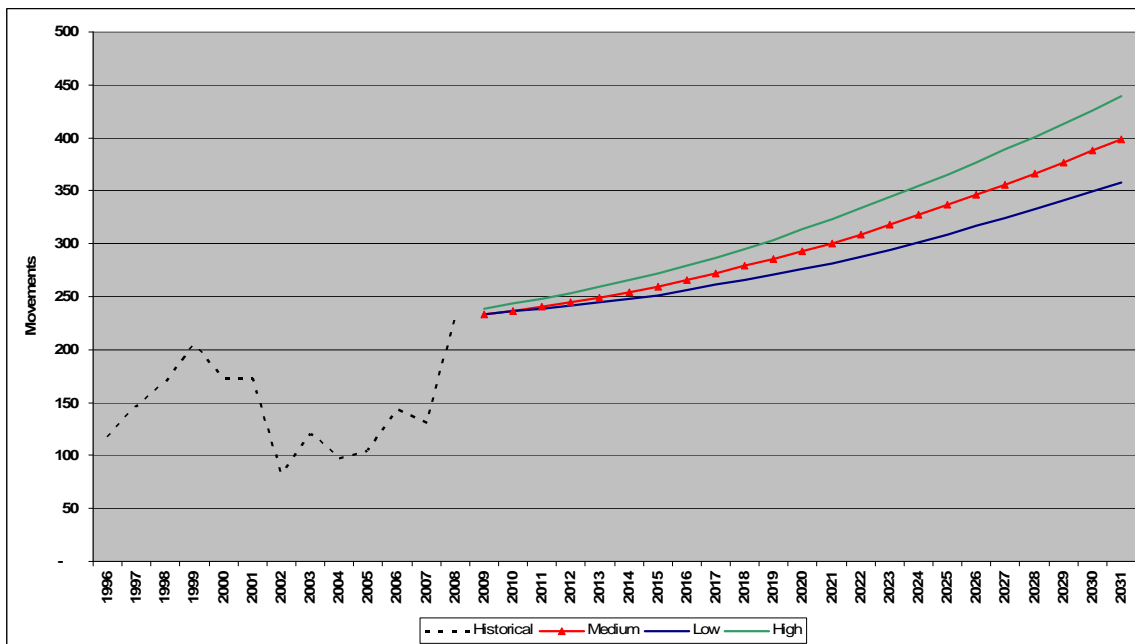


Figure 4-6 – Military Operations Forecast – Peterborough Municipal Airport

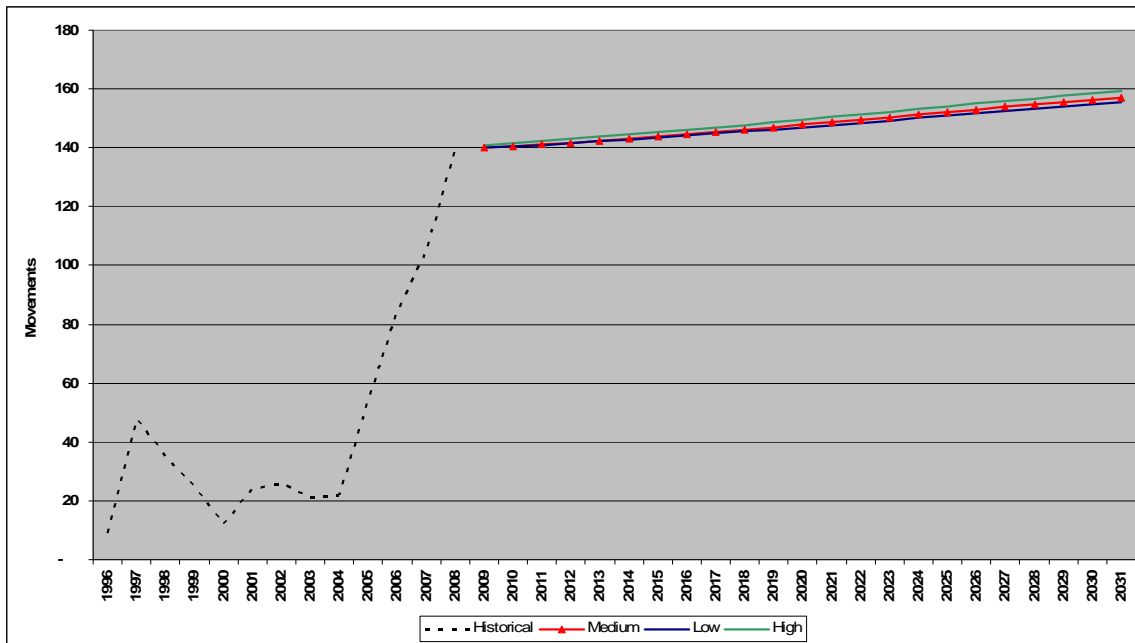
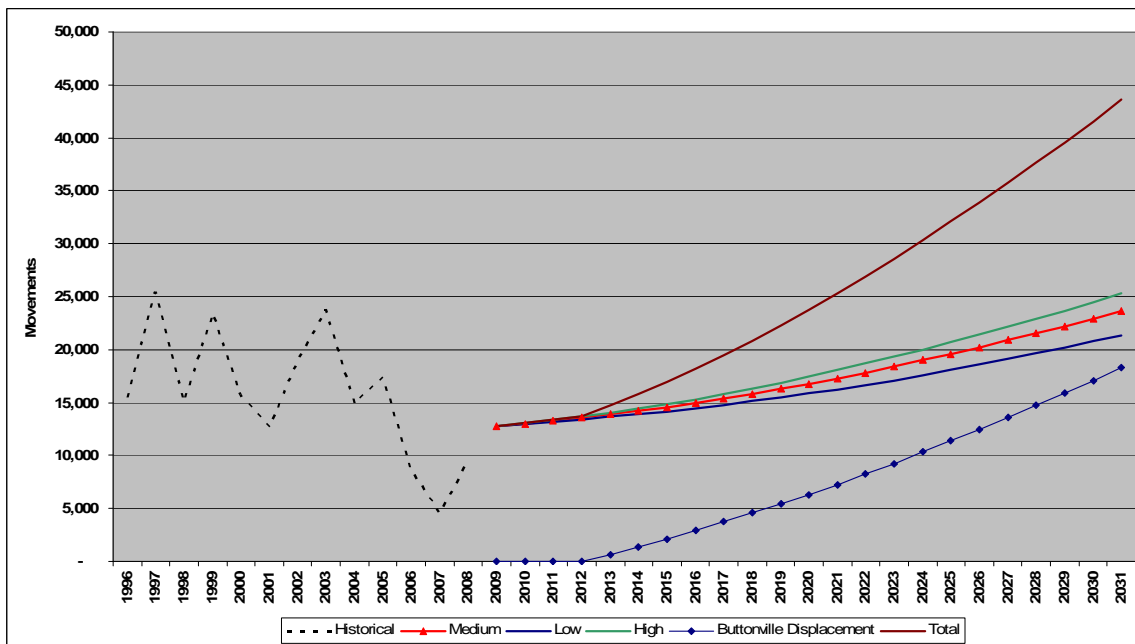


Figure 4-7 – Local Operations Forecast – Peterborough Municipal Airport



4.7 Design Aircraft

4.7.1 Background

An airport facility is designed to permit regular operation of aircraft up to and including certain sizes and performance capabilities. This aircraft is known as the design aircraft.

The design aircraft is normally the most operationally and/or physically demanding aircraft to make substantial use of the facility. The design or critical aircraft forms the basis on which protection zones, clearances etc. are determined. It should be noted that the aircraft that is most demanding in terms of size or pavement loading, may not necessarily be the same as the most performance limited aircraft.

The choice of design aircraft is determined by a number of factors. These include the forecasted airport activity and traffic activity as well as the technical characteristics of the aircraft that currently utilize the facility and those aircraft most likely to utilize the facility in the future. Some of the technical characteristics considered include the runway length requirements for aircraft operation, the aircraft weight and load factor ratings and the physical dimensions of the aircraft and associated manoeuvring requirements.

4.7.2 Current Design Aircraft

The design aircraft in the Airport Operations Manual is the DC-9. The last version of this aircraft was delivered in 1982, nearly thirty years ago. According to Boeing, "The DC-9 was designed specifically to operate from short runways and on short to medium-range routes so that the speed, comfort and reliability of jet transportation could be extended to hundreds of communities previously served only by propeller-driven airliners". The DC-9 has a wingspan of 28.5 meters and a typical maximum takeoff weight of 42,000 Kg. The aircraft load rating for a DC-9 (series 10) is 7.8. The DC-9 is not an appropriate aircraft on which to base future planning and design of Peterborough Airport.

The aircraft is no longer in Canadian use, it is no longer in production and is not representative of the future direction of the Airport.

4.7.3 Recommended Design Aircraft

Client consultations and recommendations from the Business Case for Infrastructure Development were used to determine a new candidate for the design aircraft. Each aircraft was assessed in terms of performance requirements and geometric and loading requirements. The Business Case established a recommended runway length of 2,314m (7,000') in order to accommodate larger aircraft types operating to key market regions. The review looked at the two most prevalent narrow body aircraft types, the Airbus A320 series and the Boeing 737 series.

The CRJ 100/200 and CRJ 900 series were also assessed because of their importance and prevalence at the Airport. The results of the analysis are presented in Table 4-2.

The Airbus 320 and 319 have a very small takeoff weight penalty (1% to 6%) when operated from a 2,134m (7,000') runway under the most demanding conditions. The Boeing 737-700 also has a negligible restriction (less than 1%) in takeoff weight. The CRJ 100/200/900 and the BBJ are not restricted in their operational weights from the runway. Actual airplane performance can vary from aircraft to aircraft within the same series depending on the options selected by the individual customer and the operational procedures employed.

It is recommended for the long term that the Boeing 737-BBJ (Boeing Business Jet) be the design aircraft for the Airport. This aircraft has the most demanding pavement loading and zoning requirements of the analyzed aircraft. The Boeing 737 BBJ has three engine thrust rating options. For the design aircraft purposes the 26,300 LB thrust variant was selected as the representative variant.

Table 4-2 – Design Aircraft Analysis

Aircraft	MTOW in Kg	Aircraft Load Rating	TOW in Kg for 7,000 ft Runway	Range in NM at Max Payload (7,000 ft Runway)	Range in NM at Max Fuel (7,000 ft Runway)
B737-700	70,080	10.1	69,074	2,000	4,100
B737-BBJ	77,560	10.6	77,560	3,200	5,100
A319	70,000	10.2	66,138	1,000	3,400
A320	77,000	10.4	76,000	1,650	2,650
CRJ-100ER	23,133	6.8	23,133	850	2,750
CRJ-200ER	23,133	6.8	23,133	1,050	2,360
CRJ-900	38,329	7.7	38,329	1,220	2,540



Boeing BBJ Recommended Design Aircraft



Bombardier CRJ200 at Peterborough

5.1 Runway 09-27

5.1.1 Operational Requirements

The Boeing Airplane Characteristics for Performance Planning describes the Boeing BBJ as follows:

"The Boeing Business Jet is a B737-700 airplane that is delivered without any interior furnishings. The customer installs specific interior configurations. This 737-700 model airplane is equipped with a 737-800 landing gear configuration and has weight and performance capabilities as the -800".

The Boeing BBJ requires a minimum pavement width of 16.7 m to accomplish a 180 degree turn on the runway. During this manoeuvre the wingtip sweeps through an arc of radius 22.1 m.

Boeing's data assumes operation on a 45m wide runway. For operations on a 30m wide runway there would be more restrictive crosswind limitations. Additionally, operations on contaminated runways (with reduced stopping capability) may also be more restrictive, when compared to the standard 45 m pavement width. Nonetheless, the minimum runway width specified by many operators for this aircraft is 30m.

Payload Range of Design Aircraft

The Boeing 737 BBJ has a maximum takeoff weight of 77,791 kg and a maximum landing weight of 60,781 kg. With a 2,134m (7,000') runway length at the airfield elevation of 628' ASL, the aircraft would be capable of departing at the maximum design takeoff weight. It would have a range of approximately 3,200 NM or 5,926km. In a ferry configuration with maximum fuel, the aircraft has a range of approximately 5,100 NM or 9,445km.

Declared Distance Requirements

Takeoff distance at maximum takeoff weight at an airfield elevation of 628' ASL for wet or dry conditions (F.A.R of J.A.R) is given as approximately 2,134m (7,000').

The landing distance for wet runway conditions at maximum design landing weight is approximately 1,753m (5,750').

Aircraft Load Rating

The Boeing BBJ has a tire pressure of 1.47 MPa and has a maximum Aircraft Load Rating (ALR) of 10.6. This suggests that the corresponding Pavement Load Rating (PLR) for the Airport infrastructure should be at least 10.6.

The current airport operations manual indicates a PLR of 8 with tire pressures up to 1.0 MPa. It is recommended that Runway 09-27, Taxiway A and the main apron be strengthened to accommodate the load and tire pressure of the Boeing BBJ.

Future pavement construction, such as the proposed apron for a new ATB/FBO facility, should be constructed with a PLR of at least 10.6. This is especially important as the BBJ could be operating at the Airport at its maximum take-off weight, especially if the aircraft is being delivered to an overseas market after modifications have been completed. If pavements are constructed with a PLR value of less than 10.6 aircraft operations could be restricted.

5.1.2 Infrastructure Requirements

Runway Length

A runway length of approximately 2,134m (7,000') is recommended to support the Boeing Business Jet with unrestricted operations.

Runway 09-27 is currently designated as a Code 3 Non-Precision instrument facility allowing for aircraft to operate under Instrument Meteorological Conditions (IMC), to a decision height of approximately 432' Above Ground Level (AGL).

If the runway is expanded to 2,134m (7,000'), Transport Canada would view it as a Code 4 facility, as it is greater than 1,799m in length.

The change upwards to Code 4 will require an increase in the size of the runway strip as a result of having a longer runway. The justification is that it would be used to support larger aircraft types operating at higher speeds, thus requiring larger protective areas surrounding the pavement surface. If the City of Peterborough wishes to maintain the current Non-Precision status of the runway, the runway strip surrounding the pavement surface would have to double in size and extend 150m on each side of the runway centreline, as opposed to the 75m on either side of the centreline that is currently provided.

The new aircraft hangar occupied by Flying Colors would penetrate the transitional zoning surface extending from the edge of the runway strip by approximately 5.9m if Runway 09-27 were to be extended to a Code 4 facility and classified as a Non-Precision facility.

In order to overcome this potential violation, the runway could be classified as a Code 4 Non-Instrument facility, as this type of classification only requires 75m of runway strip to be provided on either side of the runway centreline. Although this would ensure that the Flying Colors hangar does not violate the transitional zoning surface associated with the runway, the decision heights associated with the instrument approaches to both ends of the runway would have to be increased to 500' Above Ground Level (AGL) according to Transport Canada standards. As the future role of the site is predominantly as an industrial airport, increasing the instrument approach decision heights to 500' AGL is not expected to dramatically limit activity at the Airport.

If the Airport were to have potential for high-volume scheduled services, a lower decision height would likely be desirable. ***It is recommended that Runway 09-27 be classified as a Non-Instrument facility in order to accommodate existing structures, and to allow aircraft operations on a longer Code 4 runway.***

Runway Width

Transport Canada Document TP312E – Aerodrome Standards and Recommended Practices recommends a runway width of 45m to support Code 4 aircraft operations. As TP312E states a recommendation (as opposed to a standard), the runway can be extended to a Code 4 facility using a 30m width without jeopardizing the Airport's certification status. This interpretation has been confirmed by the City in consultation with Transport Canada.

In the absence of scheduled services or high frequency operations by Code 4 aircraft, and considering the operational characteristics of the Boeing Business Jet, ***it is recommended that the current width of 30m be maintained while extending Runway 09-27 in length.***

Runway Pavement Structure

The condition of the Runway 09-27 pavement surface is considered to be fair (AMEC 2008), with minimum amounts of cracking and deterioration.

A preliminary analysis considered the current runway, taxiway and apron structure to determine its ability to support design aircraft operations. Information on the current pavement structures was obtained including original design drawings prepared in 1967, a Pavement Design Report prepared in June 1995, and design drawings related to pavement rehabilitations for Runway 09-27, Taxiway 'A', and the main apron.

Analysis suggests that approximately 95mm of asphalt concrete surface should be applied to Runway 09-27, Taxiway 'A', Taxiway 'B' and Apron I to strengthen the pavement structure for the design aircraft. The asphalt concrete surface overlay should meet Transport Canada runway specifications regarding quality of materials and placement. Future pavement construction should also be capable of supporting the design aircraft in all appropriate areas of the Airport.

Original runway construction included a base drainage system. It is understood that there are no outstanding complaints with respect to runway drainage. It is therefore assumed that the current drainage system is operating as per its design. In the event that surface drainage issues arise in the future, a full engineering drainage study could be considered by the City.

Runway Lighting

The Airport is currently equipped with a Medium Intensity Type K runway edge lighting system which is considered adequate by users; however, consultations with the Airport operator suggest the current airfield lighting system is upwards of 40 years old and is at its maximum capacity. Visual aids also include taxiway and apron edge lighting and an aerodrome beacon.

Based on operational requirements, meteorological assessment and user needs, no significant changes are recommended with respect to the current level of airfield lighting systems. Additional edge and end lighting will be required to support the runway extension as well as additional apron and taxiway edge lighting.

Interest has been expressed by management in the introduction of LED edge lighting systems as they become approved for airport operations in Canada. The principle advantage is that of significantly lower power consumption and therefore energy savings over existing systems. ***It is recommended that energy efficient lighting systems be installed at the Airport as these become available for use on airports.***

Runway End Safety Areas

A Runway End Safety Area (RESA) provides a cleared and graded area in the event of an aeroplane undershooting or overrunning the runway.

Peterborough Airport does not currently have designated RESAs. Although not currently required by Transport Canada, the regulations are expected to change to make RESAs mandatory in the near future.

It is recommended that the minimum size RESA be provided at the ends of Runway 09-27, extending 90m from the end of the runway strip, and having a width of 60m.

Clearways and Stopways

Clearways are defined by Transport Canada as 'a rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height'.

Clearways are located beyond the runway end and increase the Takeoff Distance Available (TODA) to aircraft departing from the Airport. The Peterborough Municipal Airport does not have clearways designated within their Airport Operations Manual. Clearways are not required as a result of the extension of Runway 09-27, primarily due to the fact that sufficient TODA will be available based on a 2,134m (7,000') runway length when considering operational characteristics of the design aircraft.

Stopways are defined as rectangular areas on the ground at the end of the runway pavement surface prepared as a suitable area in which an aircraft can be stopped in case of an abandoned takeoff and are usually provided at large international airports. Stopways are not currently provided at Peterborough Municipal Airport and are not perceived to be required in the future.

Visual Approach Aids

Visual approach aids assist aircraft approaching a runway by providing directional guidance. Two types of visual approach aids are currently provided at the Peterborough Municipal Airport:

- ✈ Precision Approach Path Indicators (PAPI); and
- ✈ Runway Identification Lights (RILS).

PAPIs provide the pilot positive visual indication of the aircraft's position relative to the optimal glide slope during final approach to the runway. Transport Canada standards state that PAPIs are required when the runway is not served by an electronic glide path and the runway is used by turbojet or other aircraft with similar approach guidance requirements.

Three types of PAPI systems are available. PAPI types are selected based on the eye-to-wheel height of the runway's critical aircraft, with P1 supporting aircraft with low eye-to-wheel heights, and P3 types supporting larger aircraft with greater eye-to-wheel height measurements. The current PAPI systems at the Peterborough Municipal Airport are classified as P1-type supporting approaches to Runways 09 and 27. Both installations are located on the left side of the landing surface, within the runway strip.

P1 PAPI systems generally support aircraft with an eye-to-wheel height of up to 3m.

Typical aircraft types with eye-to-wheel characteristics within this range generally include light general aviation aircraft, turboprops, and other corporate business jets. This is appropriate for current operations at the Airport in poor weather.

It is recommended that the PAPI systems be upgraded to P2-type to support the design aircraft (Boeing 737-700) once the runway extension program is completed. A review of the aeroplane's characteristics indicates that the 737-700 has an eye-to-wheel height of 3.74m, indicating that P2-type PAPI systems will be required.

RILS (strobe lights) should normally be provided where lack of daytime contrast detracts from the effectiveness of approach lights or where the threshold is difficult to identify and enhanced conspicuity is necessary.

Peterborough Airport is not equipped with approach lights. RILS are provided at the thresholds of Runways 09 and 27.

It is recommended that RILS be provided as part of the runway extension program.

Electronic Approach Aids

Electronic approach aids are generally provided to support aircraft approaches to the runway under Instrument Meteorological Conditions (IMC). A Non-Directional Beacon (NDB) is provided at Peterborough Municipal Airport to support non-precision instrument approaches to Runway 09. An RNAV approach is also available to support instrument approaches to Runway 27; however, there are no ground-based electronic approach aids supporting this system as it utilizes the Global Positioning System (GPS).

Based on the meteorological assessment, the operational requirements of users, lack of scheduled air services at the Airport, and the future designation of Runway 09-27 as a Non-Instrument runway, there does not appear to be a need for providing additional electronic approach aids within the planning horizon.

Airfield Electrical

Consultations with the Airport operator suggest that the Field Electrical Centre (FEC) will require expansion to accommodate any additional airfield lighting.

Expansion of runways, taxiways or aprons will require the installation of additional lighting that will place increased demands on the FEC. Further detail as to future airfield electrical requirements should be provided during the detailed design stage of the Airport Development Project. At a minimum, and subject to engineering confirmation, several additional regulators and ancillary equipment upgrades or replacement will likely be required in the FEC, depending on age and condition. In order to decrease the demands on the FEC, LED lighting installations could also be provided as they generally require less energy to operate.

5.1.3 Runway 09-27 Expansion Constraints

Airport Boundary

The irregular shape of the current airport boundary is defined by several different features as described in Section 3.4.1. The runway expansion concepts lie within the current airport boundary; however, medium and long term developments will require the Airport to acquire additional land to the east of Airport Road, and to the west of the current core development area between Runway 09-27 and Mervin Line.

Highway 115

Highway 115 lies to the west and west-northwest of the current airport property. Future extension of Runway 09-27 may be impacted by the presence of this highway however, the constraints related to the presence of Cavan Creek are more likely to have an impact on runway extension.

Runway expansion to the west would include an extension of approximately 610m. The Ministry of Transportation Ontario (MTO) has provided spot elevations on the road which were used to assess the highway's impact on the future Non-Instrument approach surface associated with the extended runway. A 4.3m vehicle allowance was used (per TP312E) along with a worst-case threshold elevation of 189.0m ASL to identify any potential approach surface violations.

Analysis indicates that this highway might constrain runway expansion because the approach surface lies less than 0.5m above the hypothetical vehicle allowance on the highway.

However a detailed engineering study examining cut and fill requirements and ideal threshold elevations might help mitigate the effects of Highway 115. If the future threshold elevation of Runway 09 were to be established at 192.9m ASL, the approach surface would lie approximately 3.9m above the 4.3m vehicle allowance. In general, the presence of Highway 115 is not considered a major constraint to runway extension.

Airport Road

Airport Road constrains expansion, especially in terms of extending Runway 09-27 to the east. Airport road runs in a north-south direction and connects several rural residences to the City of Peterborough. To achieve a runway length of 2,134m (7,000') it is likely that Airport Road will have to be either closed or relocated.

The City owns land to the east of Airport Road which is recommended for future airside development within the Master Plan to support additional airside industrial development lots. To successfully develop this area, access must be provided to the runway and taxiway system. As a result, Airport Road would have to be realigned or closed to permit this development.

Cavan Creek

Cavan Creek is a small watercourse that crosses the west end of the Airport. The creek acts as a primary drainage mechanism for a small area of the Township, and connects to the Otonabee River to the south of the Peterborough Municipal Airport.

The Cavan Creek Airport Reach Floodplain study was completed in 1999 by The Otonabee River Conservation Authority (ORCA) to assess the functioning of the creek's floodplain and ascertain the extent of development that would be acceptable while providing safety to persons and property. The study identified the Cavan Creek floodplain as defined by the 'Flood Line Mapping Study' completed in 1981.

Analysis suggests that the flood lines from flows discharging down Cavan Creek have little impact on the Peterborough Municipal Airport lands with one key exception. A channel located to the north of Runway 09-27 drains east to west towards Cavan Creek; however, flood waters flow backwards up this channel and can spread out into the Airport lands through various routes. The study noted that this spill effect has the potential to flood some portions of the Airport land up to an elevation of 190.61m ASL.

Consultations suggest that the creek is a fish habitat for freshwater species indicating that any future airport developments may require significant levels of Environmental Assessment if the creek were to be impacted, especially as a result of extending Runway 09-27 to the west.

Otonabee River

The Otonabee River flows close to the Airport on the east side. The river forms part of the Trent Severn Waterway system and plays a major role as a downstream watershed for many lakes within the Kawartha Region.

Floodplain impacts associated with the Otonabee River were also identified in the Cavan Creek Airport Reach Floodplain study. Specific areas were addressed that could impact developments within the current airport boundary. The study noted that a floodplain is created on the Airport lands due to high water elevations on the Otonabee River itself. It is suggested that the floodplain is created due to either the Otonabee River floodwaters extending up Cavan Creek, and/or the overall high elevation of the Otonabee River restricting movement of Cavan Creek flows into the River. Any developments within the defined floodplain area are susceptible to flooding when constructed below 189.99m ASL.

An additional floodplain area was identified to the east of Airport Road. These lands could also flood due to high waters of the Otonabee River. The Airport Reach Floodplain Study indicates that the high flows of the Otonabee River have a potential to flood this area to an elevation of 190.22m ASL. Both floodplains have been merged to show impacts on and adjacent to airport property.

The presence of the floodplain associated with both Cavan Creek and the Otonabee River could have a significant impact on any future airport developments. Consultation with the Otonabee River Conservation Authority is needed and an Environmental Assessment and other regulatory approvals may be necessary.

Otonabee Region Conservation Authority

Conservation Authorities were created in 1946 by an Act of the Provincial Legislature. Authorities are mandated to ensure the conservation and responsible management of Ontario's water, land and natural habitats through programs that balance environmental, human and economic needs.

The Otonabee Region Conservation Authority (ORCA) serves municipalities within the local watershed region, encompassing the drainage basin of the Otonabee, Indian and Ouse Rivers. In general, any activities or developments impacting the watershed must be approved by the ORCA, including development within floodplains associated with the watershed. In terms of the Peterborough Municipal Airport, the ORCA has defined significant floodplain areas on and adjacent to the Airport site as noted above. The floodplain areas have critical elevations that are established based on water levels experienced during a 100-year storm. All future airport developments within the designated floodplain areas should be constructed above the critical floodplain elevation wherever possible.

While current development areas at the Airport have been constructed above the critical floodplain elevation, the areas available for the expansion of the existing airport facilities are mostly designated as floodplain and, if they are to be filled, consultations with ORCA should be conducted.

Figure 5-1 illustrates constraints to runway expansion.

5.1.4 Option-1 East Extension

Three options for expansion of Runway 09-27 are presented:

- ✎ Option 1 East Extension;
- ✎ Option 2 West Extension; and
- ✎ Option 3 East/West Extension

The first runway expansion option extends to the east beyond Airport Road, towards the Otonabee River.

In order to achieve a runway length of 2,134m (7,000') a 610m (2,000') pavement extension is required, while maintaining the current pavement width of 30m (100'). Protective areas surrounding the runway are required including a runway strip 60m beyond the pavement end and a Runway End Safety Area (RESA) extending 90m beyond the end of the runway strip. The RESA would be graded and grassed to minimize the environmental impact on the river.

An additional 3.7 Ha of land outside the current airport property limits would be required to support a runway extension of this magnitude. The runway pavement would extend to about 370 m from the edge of the Otonabee River.

This runway expansion option places new infrastructure within the Otonabee River floodplain; therefore, a detailed Engineering Study and a scoped Federal Environmental Assessment is needed to address grading requirements and mitigate any effects on the floodplain. Floodplain mitigation measures may also need to be applied elsewhere to compensate for floodplain area lost through filling as a result of extending Runway 09-27 to the east.

5.1.5 Option-2 West Extension

In order to achieve the desired 2,134m (7,000') runway length, a 610m (2,000') pavement extension in a westerly direction is illustrated in Figure 5-3. The runway width would remain at 30m (100'). Protective areas surrounding the runway include a runway strip and RESA. Additional land outside the current airport boundary would not be required under this scenario.

Extending Runway 09-27 to a distance of 610m in a westerly direction has several implications, primarily due to the presence of Cavan Creek. Runway elevations with respect to Highway 115 would also require careful analysis and consideration during design.

Cavan Creek and the ditch running east to west to the north of the runway would have to be altered either by relocation or by providing large culverts.

These modifications should provide for the future extension of the 150m wide runway strip, and 120m graded area surrounding the runway. A significant amount of fill may also be required.

Preliminary consultations indicate that altering the Cavan Creek watercourse could have significant environmental impacts, especially due to the presence of several fish species within the creek. The runway extension will also impact the floodplain associated with the Creek and could significantly reduce its storage capacity, making new areas susceptible to flooding, especially during a 100-year storm.

Terrain to the west of the current property boundary rises, potentially creating physical zoning issues under the approach surface to Runway 09. If runway extension were to occur in a westerly direction, a detailed study should be conducted to determine an optimal threshold elevation for Runway 09.

It will be necessary to ensure runway take-off/approach slopes and physical zoning issues related to the rising terrain and the presence of Highway 115 are addressed. If the new threshold elevation of Runway 09 were set to 192.9m ASL, approximately 3.9m of clearance would be provided between a 4.3m vehicle positioned on the highway and the approach surface.

5.1.6 Option-3 East and West Extensions

Under this option a 106m (347') pavement extension would be constructed to the west, and a 504m (1,653') extension to the east. The current runway width of 30m (100') would be maintained.

The 106m extension to the west was established to create minimal disturbance to Cavan Creek and the easterly extension distance was established to achieve the remaining desired runway length of 2,134m. Both pavement extensions include a runway strip beyond the pavement end and a RESA. An additional 1.5 Ha of land to the east, outside the current airport property limits would be required.

In Option-3 the runway would extend to approximately 475m from the edge of the Otonabee River. The end of the respective RESAs would form the closest point to the edges of the Otonabee River at the east end and to Cavan Creek at the west end. This runway expansion option would also take place within the Otonabee River floodplain and a scoped Federal Environmental Assessment would need to be conducted in order to mitigate any effects on the floodplain. The Otonabee Region Conservation Authority would be one of the authorities to be consulted within the scoped Federal EA.

An approximate distance of 312m would be provided from the closest edge of the RESA to the bank of the Otonabee River.

The southerly edge of the RESA beyond Runway 27 would encroach on Cavan Creek by approximately 25m. Since provision of a RESA is only a recommended practice under TP312E the Airport should still be granted an airport certificate without providing the full length RESA. If the regulations were to change making RESAs mandatory, a minimal section portion of Cavan Creek may have to be adjusted to provide the full 90m RESA length on the south side.

Figures 5-2, 5-3 and 5-4 illustrate Options 1,2 and 3 respectively.



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Client



City of Peterborough

Title

AIRPORT EXPANSION CONSTRAINTS

Notes

- Floodplain
- Property
- Boundary

Figure No.

5-1

Drawn By

HK

Approved By

RAM

Date

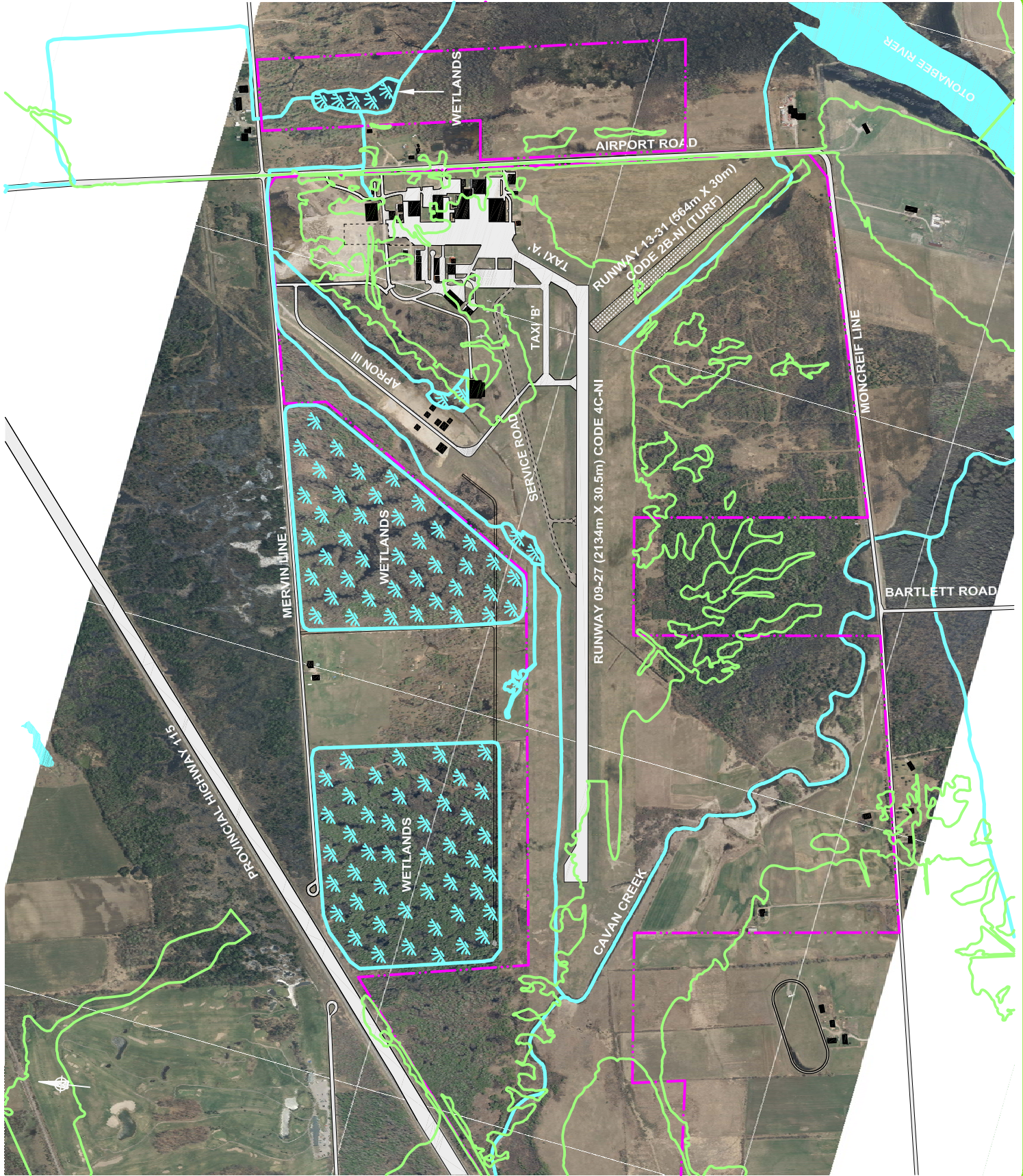
September 2009

Scale

N.T.S

Filename

AIRPORT H.K.





One Antares Drive,
Suite 250, Ottawa, ON,
Canada K2E 8C4
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Client

City of Peterborough

Title

AIRPORT DEVELOPMENT PLAN

**OPTION 1:
EAST RUNWAY
EXTENSION**

Notes

-  New Pavements
 Existing Pavements
 Existing Boundary
 Additional Land Required

Figure No.

5-2

Drawn By

 $\frac{1}{2}$

Approved B

RAM

Date _____

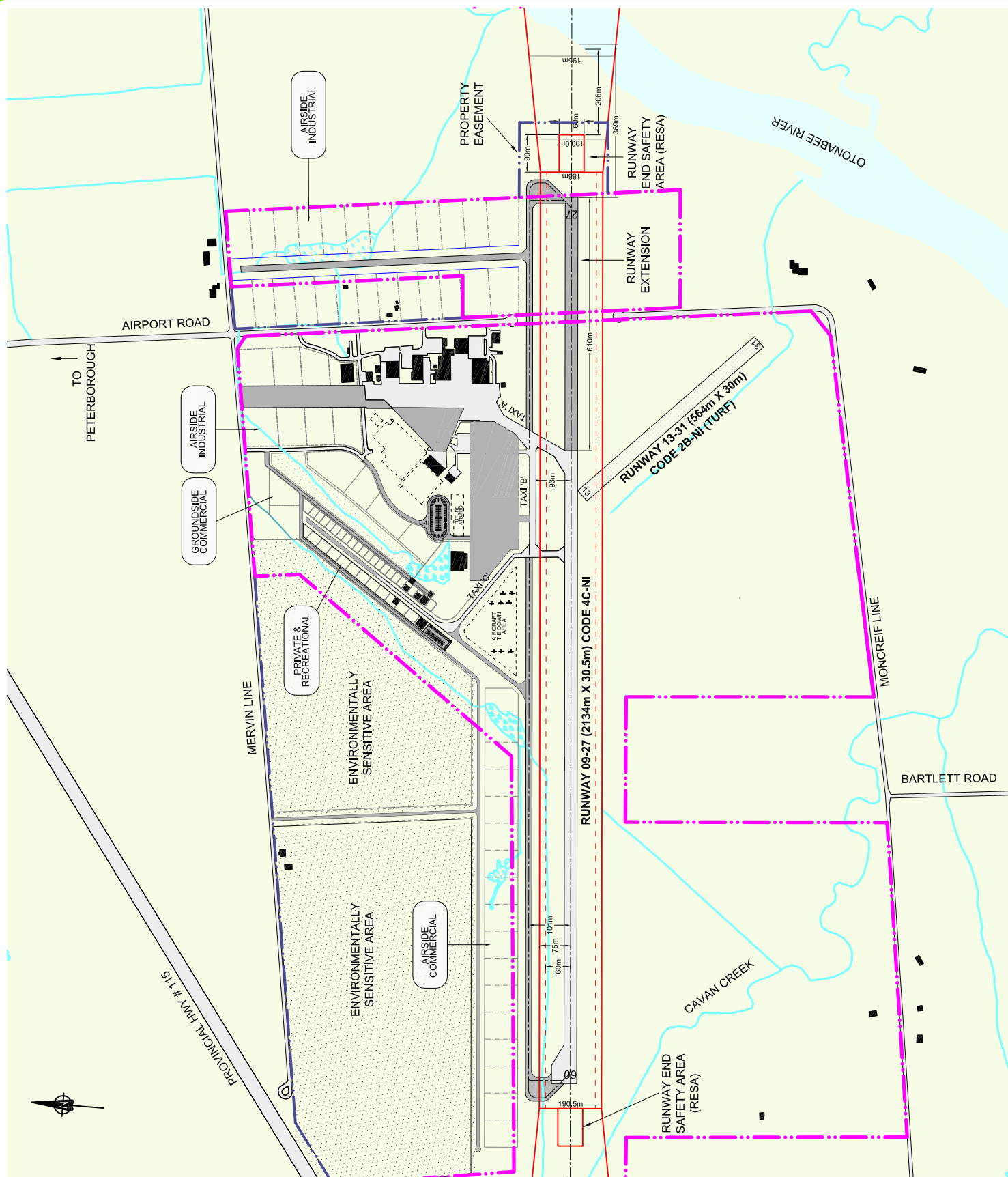
September 2009

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N.T.S.

Filename

AIRPORT H.K.





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City of Peterborough

Title

AIRPORT DEVELOPMENT PLAN

OPTION 2: WEST RUNWAY EXTENSION

Notes

1. Preliminary
2. All dimensions approximate

- New Pavements
- Existing Pavements
- Existing Boundary
- Additional Land Required

Figure No.

5-3

Drawn By

HK

Approved By

RAM

Date

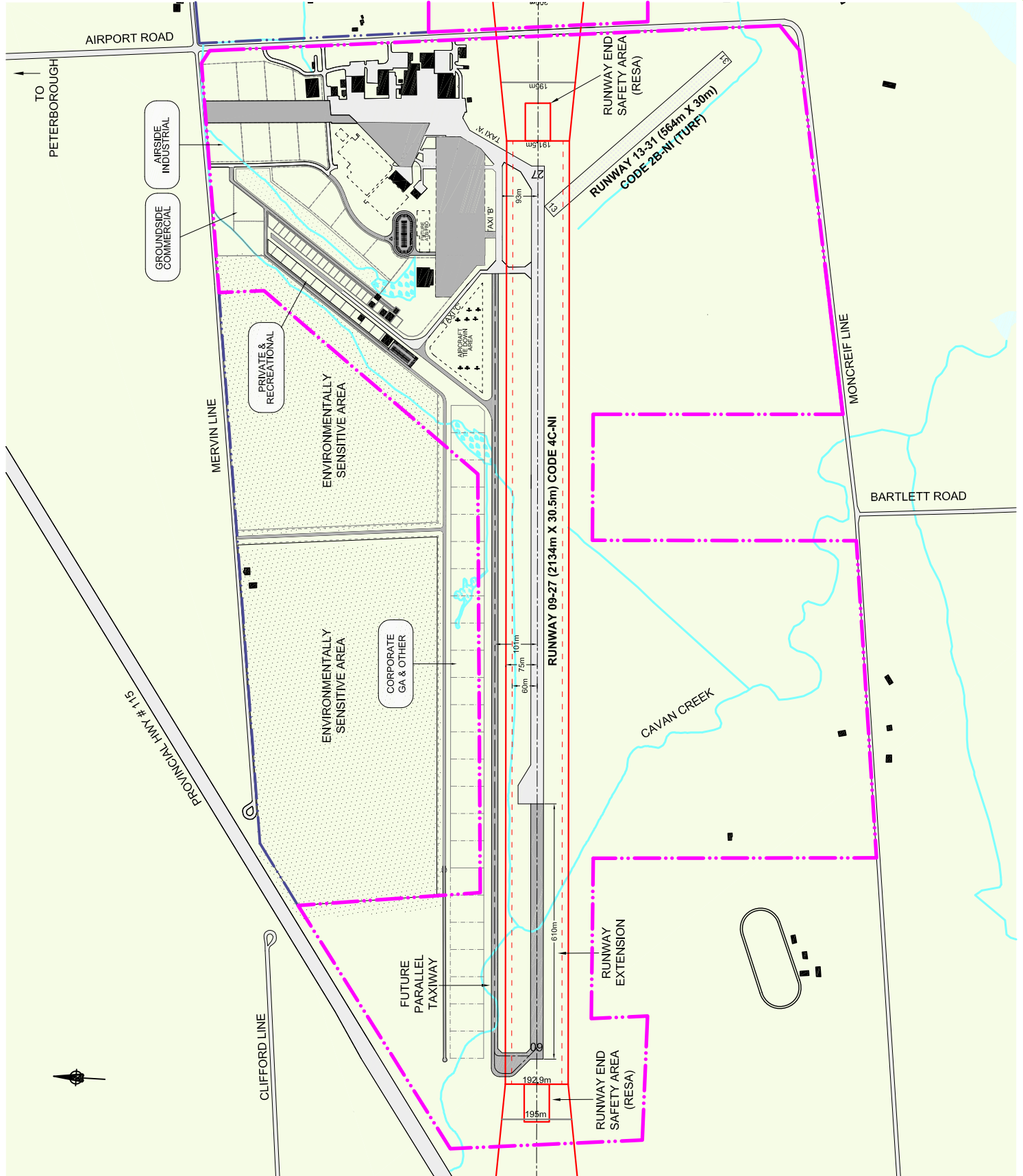
September 2009

Scale

N.T.S

Filename

AIRPORT H.K.





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Client

City of Peterborough

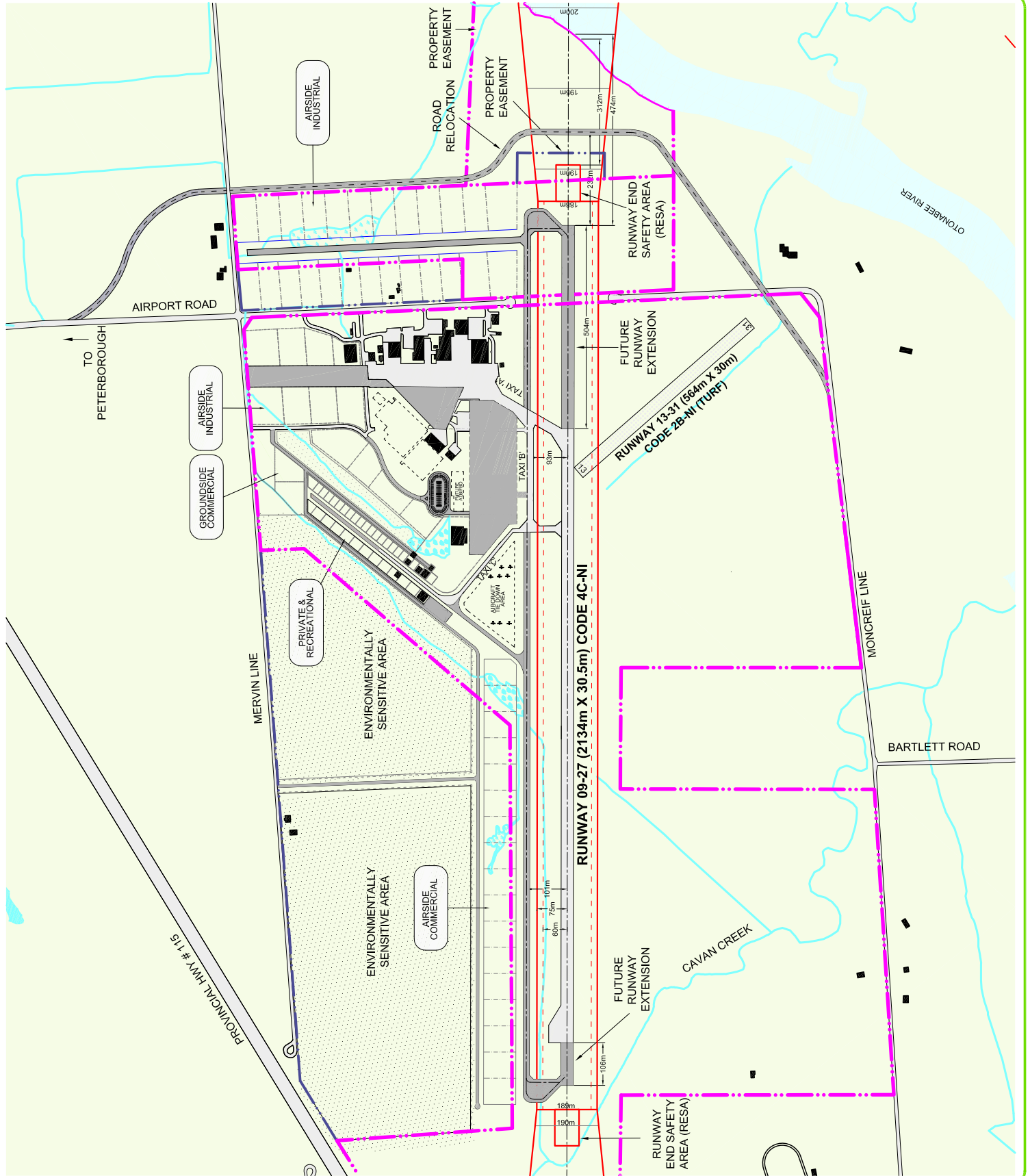
Title
**FUTURE
AIRPORT
DEVELOPMENT**

**OPTION 3:
EAST/WEST
RUNWAY
EXTENSION**

Notes

1. Preliminary
 2. All dimensions approximate
- New Pavements
 - Existing Pavements
 - Existing Boundary
 - Additional Land Required

Figure No.	5-4
Drawn By	HK
Approved By	EGL
Date	September 2009
Scale	N.T.S
Filename	AIRPORT H.K.



5.1.7 Options Assessment

The expansion options were assessed to determine the preferred development strategy. Runways are primary infrastructure components and their location, characteristics and operational effectiveness have a major impact on all other activities at the Airport. Several other criteria were assessed including but not limited to environmental impacts associated with Cavan Creek, Otonabee River and provincially significant wetlands, floodplains, project costs, impacts on Airport Road, and additional land requirements. A summary of the assessment is provided in Table 5-1 below.

Table 5-1 – Runway Expansion Assessment

Criteria	Option-1	Option-2	Option-3
Aviation Operations	Most desirable	Least desirable	Desirable
Airport Operations	Extended operations	Centralizes operations	Balances operations
Airport Commercial	Facilitates Industrial Area #2	Precludes Industrial Area #2	Optimum development potential
Additional Land Requirement	0 Ha.	1.8 Ha approx	0.3 Ha approx
Cavan Creek Impacts	High	None	Moderate
Floodplain Impacts	High	Moderate to High	Moderate
Otonabee R. Impacts	None	High	Moderate
Airport Road Impacts	None	Road Closure	Realignment possible
Environmental Impact	High	High	Moderate
Schedule Risk	High 30+ mo.	Medium 18 mo.	Medium 18 mo.

5.1.8 Recommended Option

Based on the assessment and consultations, Option 3 - East and West Extension is preferred.

Extending the runway on both ends will have the least impact on both Cavan Creek and the Otonabee River, and still provide the required runway length to support the design aircraft. It will place the core airport development area in a more central location with respect to the runway and will allow corporate and industrial aircraft traffic to be separated from flying training and general aviation traffic to the greatest extent. Airport operations can be developed centrally on new Apron 2, and a variety of commercial land parcels can be developed for different potential uses at both ends of the runway as well as in the existing core area.

Impacts on the combined Cavan Creek and Otonabee River floodplain are less in Option 3. Consultations with the ORCA indicate that encroachment into the Otonabee River floodplain would have a lesser impact as encroachment into a floodplain associated with a smaller watercourse because the storage lost on the floodplain is negligible relative to the storage capacity of the total system.

Extending the runway on both ends provides for either closure or relocation of Airport Road. Option 2 would not support the relocation of this road because of the close proximity of the runway to the Otonabee River.

The overall environmental impact associated with Option 3 is considered to be significantly less when compared to Options 1 and 2. Due to the lengthy Environmental Assessment process associated with diverting or relocating a freshwater creek, the City may encounter difficulty completing the runway expansion project within the timeframes stipulated under the Infrastructure Stimulus Fund if Option 1 was selected as the preferred option.

Due to the minimal impact on Cavan Creek as presented in Option 3, a four season Environmental Assessment process may not be required and the runway expansion project could be completed by the spring of 2011.

It is recommended that Runway 09-27 be expanded in phases to minimize interference with tenant business operations. The easterly extension could occur first and the threshold of Runway 27 could be displaced to maintain the runway's operational state while providing adequate physical zoning clearance for construction equipment. Adequate runway length should be available for aircraft operators on a temporary basis. Once the easterly extension is complete, the 106m pavement extension on the west end can be completed with a displaced threshold to ensure physical zoning compliance.

5.2 Other Airfield Systems

5.2.1 Runway 13-31

Runway 13-31 is a crosswind runway at the Peterborough Municipal Airport. Crosswind runways are generally provided to increase airport availability under various wind and velocity conditions, especially for light aircraft types that have operating limitations for crosswinds greater than 15 knots at 90 degrees to the runway centreline.

Consultations with the Airport operator indicate that Runway 13-31 is used for approximately 5-10 aircraft movements a week during the summer months, primarily by small General Aviation (GA) operators.

Deficiencies

Review of the wind rose presented in Figure 3-6 shows that adequate in-to-wind coverage is provided by Runway 09-27 based on historical climate data. Crosswinds of greater than 15 knots at an angle of 90 degrees to the runway centreline occur very infrequently. This shows that Runway 13-31 may not be required in the future. However, this runway provides an alternate grass strip for light aircraft activities, and requires minimal maintenance expenditure.

Requirements

Analysis suggests that a crosswind runway is not required at the Peterborough Municipal Airport based on historical climate data identifying typical and extreme wind speeds and directions. However, the location of the runway does not conflict with other airport developments and the runway could remain operational throughout all planning horizons.

5.2.2 Taxiways

Taxiway A provides the primary access between Apron 1 and the runway and was developed to Code C standards.

Taxiway 'B' is a partial parallel taxiway supporting Runway 09-27.

Taxiway 'C' is designated as a Code A facility supporting only GA aircraft.

Deficiencies

Taxiway A was constructed to support the DC-9 design aircraft which no longer serves the Airport. The single point of access and configuration of Taxiway A currently limits aircraft movements from the apron.

The distance from the centreline of Runway 09-27 to the centreline of Taxiway 'B' is approximately 93m, and was designed to support a Code 3 Non-Precision runway. Transport Canada's Aerodrome Standards and Recommended Practices do not indicate a taxiway-runway centreline offset distance for a Code 4C Non-Instrument runway. The greater offset distance of 101m for a Code 4D Non-Instrument runway is therefore considered applicable. Any future parallel taxiway should therefore be constructed with a centreline to centreline offset distance of 101m.

Taxiway 'B' is currently situated too close to the centreline of Runway 09-27 as a Code 4 facility. ***It is recommended that discussions be held with Transport Canada to determine whether the existing taxiway may be "grandfathered" or whether Taxiway 'B' should be offset a further 8m to the north to meet Code 4 requirements.*** Relocation could be accomplished when the new apron is constructed, if desired.

If necessary an Aeronautical Study could be undertaken to demonstrate the negligible impact the current taxiway location will have on the safety of a Code 4 runway operation.

Taxiway C appears to have inadequate clearance from the taxiway centreline to the nearest building edge to provide for a Code A taxiway strip of 16.25m.

Requirements

It is recommended that Taxiways A and B be upgraded to support the BBJ design aircraft with a PLR of 10.6 or higher.

It is recommended that Taxiway B be extended as a Code C facility to support Runway 09-27. It should be progressively constructed in the short and long term planning horizons in co-ordination with runway development and traffic growth. Aircraft holding bays should be provided in proximity to where the taxiway connects to the runway thresholds to permit efficient aircraft movement flows.

It is recommended that Taxiway C in the vicinity of the private hangars be redesignated as an apron. As an apron a taxilane requiring only a 12m offset distance could be established to serve the hangars.

Timing of taxiway construction will depend on activity levels at the Airport. Additional taxiways may also be required to support additional airside commercial development areas including the future development area identified to the east of Airport Road.

5.2.3 Aprons

Apron I and its ongoing expansion program is considered adequate to support the current and future commercial/industrial tenants located in the immediate vicinity. Although the apron can be congested at times, the provision of a Code C taxilane should provide adequate space for efficient aircraft movement to and from the taxiways and primary runway.

Deficiencies

Apron I has not been constructed for the BBJ design aircraft and will require strengthening in areas subject to use by this aircraft.

West of Apron I several aging paved parking areas are currently utilized for parking light GA aircraft and for tie-downs. The area of old pavements has significant amounts of cracking and ravelling. It is considered to be in poor condition and should probably be replaced. Some of this area has been identified for future apron construction (Apron II) to support an Air Terminal / Fixed Base Operator facility and other users including a flying training establishment. Accommodation for GA aircraft tie-downs may decrease, and additional areas will be required.

Current Development Program

Apron I has recently been expanded to the north towards Mervin Line. Consultations with the Airport operator indicate that completion is expected by the end of 2009. Further expansion of Apron I in a northerly direction is planned for 2010 in order to provide airside access for additional aviation commercial/industrial development lots.

Development of a new Apron II will provide additional aircraft parking capacity and shift some of the aircraft traffic from the existing Apron I.

Requirements

It is recommended that Apron I be strengthened in some areas to support the new BBJ design aircraft.

A number of additional requirements have been identified in recent apron management plans and to support expansion of the aerospace industrial capacity of the Airport.

It is recommended that the area contemplated for the new Apron II be enlarged as funds are available and be capable of supporting:

- ✈ aerospace industrial traffic (Apron I overflow);
- ✈ traffic frequenting a new FBO facility;
- ✈ aircraft using a new public terminal facility;
- ✈ itinerant aircraft visiting the Airport; and
- ✈ overflow traffic from the flying training operations.

Typical aircraft types expected to utilize the new apron include, but are not limited to the CRJ-200, DHC8-300, Fairchild Metroliner, Canadair Challenger, Beechcraft 1900D and several other types.

Additional aircraft tie-down areas are required to accommodate aircraft displaced by the construction of the Apron II and the Flying Colours facility. New tie-down areas do not necessarily have to be paved, and could have a prepared turf surface.

5.3 Air Navigation Facilities

5.3.1 Communications

Current Status

The current Aerodrome Traffic Frequency (ATF) and corresponding Unicom service is expected to support current and future activities throughout all planning horizons at the Peterborough Municipal Airport. The current ATF is not considered as a deficiency.

Requirements

No additional air-ground communication requirements are currently contemplated. If expanded services are deemed necessary, these would be determined and undertaken by Nav Canada.

5.3.2 Navigation Aids

Current Status

In order to support the runway expansion program, a few minor improvements to navigation aids may be required. No deficiencies have been noted with the current Non-Directional Beacon (NDB) supporting non-precision instrument approaches to Runway 09, or with the existing RNAV/GPS approach.

Requirements

Published flight approach procedures to the Airport must be updated when the runway is extended, the runway thresholds are relocated, and the runway code is increased.

5.3.3 Surveillance

Current Status

Low-level aircraft surveillance is not currently provided at the Peterborough Municipal Airport by Nav Canada. Aircraft requiring radar surveillance can request this service however this service may only be available above approximately 2,000' AGL. Aircraft requesting this type of service are generally operating under Instrument Flight Rules (IFR).

Requirements

No additional surveillance requirements have been identified.

5.3.4 Aviation Weather

Current Status

No deficiencies have been identified with the aviation weather observation system provided by the AWOS system located at the Airport, and by the remote Nav Canada FIC pilot briefing service.

Requirements

No additional aviation weather requirements have been identified.

5.3.5 Air Traffic Services

Current Status

The air traffic service provided at the Peterborough Municipal Airport is a remote access to a Nav Canada Flight Information Centre (FIC). This service is expected to adequately support current and future aircraft operations.

Requirements

Based on the current and forecast volumes of aircraft movements, Air Traffic Services in the form of a Flight Service Station (FSS) or Air Traffic Control (ATC) are not likely to be required to the planning horizon. No additional air traffic service requirements have been identified.

5.4 Air Terminal Building

5.4.1 Existing Public Facility

A small temporary Air Terminal Building (ATB) of some 400 m² is situated at the south end of the current development area. It supports public arrivals and departures, airport administrative functions, itinerant aircraft operations, a Transport Canada office and an aviation charity operation. A small restaurant is also provided within the existing ATB.

This building was provided on a temporary basis to the City after the previous ATB was demolished to provide space for the new Flying Colours hangar.

5.4.2 Future Air Terminal Requirements

Although significant scheduled services are not contemplated, a Public Facility is required to accommodate charter flights, itinerant aircraft and public visitors, and potential low-volume scheduled services of up to 19 passengers in the future.

Peterborough Municipal Airport experiences a limited amount of traffic and activity across a wide spectrum of aviation. The Airport currently features small, dispersed support activities and services that should be consolidated wherever possible to increase operational efficiency. Combining these facilities would also provide a more substantial public face and improve the Airport's overall image to passengers and clients.

By consolidating public and corporate requirements in a single combined facility, the City could benefit not only from the presence of a high quality Gateway Facility welcoming visitors to the City's Industrial Airport, but also from the economies of scale and mutual support realizable in a shared facility.

Potential users, services and amenities in such a combined facility could include some or all of the following:

- ✈ public waiting room, passenger services, phones, washrooms, car rental and related services;
- ✈ potential future air carrier counter and office supporting an air taxi or commuter operation;
- ✈ airport administration offices and meeting areas;

- ✈ public restaurant;
- ✈ Fixed Base Operation (FBO) providing full services to corporate and itinerant aircraft, crews and passengers;
- ✈ adjoining hangar for FBO use and/or public and corporate aircraft storage;
- ✈ offices for aviation businesses and corporate operators;
- ✈ Transport Canada aerospace industry offices;
- ✈ office for Canada Customs use;
- ✈ office, storage, workshop and staff amenities for airport maintenance operations; and even an
- ✈ adjoining airport maintenance garage.

Dedicated air cargo handling areas within the facility are not contemplated as the forecast does not indicate that significant volumes of freight will be handled at the Airport. Areas could be provided within the FBO facility to support ad-hoc deliveries.

5.4.3 Current Development (2008-2013)

The current airport development program includes site preparations for the future ATB with facility construction slated for 2010. The site for this building has been selected immediately to the west of the current airport development area, to the north of Taxiway 'B'. The future Apron II identified in Section 5.1.3 will support this facility.

5.4.4 Recommended Air Terminal Facility

Development of a shared use Air Terminal and Fixed Base Operator facility is recommended for Peterborough Municipal Airport.

The future Air Terminal/FBO facility should be sized for a pre-agreed tenant mix but is likely to have an area of 500 to 1500m² for offices and a hangar of 1,000 to 2,000 m² in size. Such a facility might include a common use arrival/departure area, shared public services, airport administrative functions, a hangar to support local and itinerant aircraft, and commercial office space available for lease.

The facility could be funded by the City, by a business investor, or through some other financing

arrangement such as a public-private partnership. Or, it could be privately financed, and space could be leased to the City for operational use. Commercial space within the building could also be leased by the owner to increase overall airport revenues.

5.5 Access Roads and Parking

5.5.1 Access Roads

The Airport is accessed from Airport Road, which connects to Highway 115 to the north and beyond to the City of Peterborough. Access is provided to the Airport's core development area by roads connecting to Airport Road. Mel O'Brien Way connects to Mervin Line to the north and provides access to businesses on the west side of Apron I. This road was recently re-aligned as part of the Airport development program. Access to the GA development area is currently provided by a gravel road connecting from Mel O'Brien Way to Taxiway 'C'.

Deficiencies

The access roads supporting the Peterborough Municipal airport adequately serve the current tenants and operators. However, the road supporting the small GA hangars to the west of the core development area is insufficient to support future development. The access road merges, as it proceeds towards the airside with Taxiway 'C' which brings light aircraft from the runway area. Aircraft and vehicles can therefore use the road/taxiway at the same time with few safeguards or controls in place.

There are airport security concerns with a shared road/taxiway and additional measures are needed to separate the vehicular traffic from aircraft operating on the taxiway. An electric wildlife fence is present between Taxiway C and entry to the runway via Taxiway B, however this barrier has limited effect in preventing unauthorized access from the road/taxiway

Consultations revealed a deficiency with vehicular access to commercial facilities located airside, just west of Airport Road. Due to the configuration of the roads vehicles making deliveries to some of the airside facilities are required to cross Apron I, sometimes causing conflicts between aircraft and vehicle movements.

In general, vehicle movements on airside should be limited to maintenance activities, with occasional use by authorized airport tenant vehicles. Alternate delivery access to these commercial facilities is required. Access could be provided by relocating the current garbage storage area between Hangars 14 and 16 as shown in the Core Area Plan.

Current Development Program

The Peterborough Municipal Airport's current development program indicates that Phase 1 of the Mel O'Brien Way re-alignment will be completed in 2009 with the paving of the road surface. Phase 2 of the Mel O'Brien Way project is scheduled for 2010 and includes construction of a new road towards the future ATB/FBO development site.

Requirements

It is recommended that access roads be constructed in the GA development area adjacent to Taxiway 'C' to provide a separate and secure taxiway on airside while providing dedicated groundside access to facility owners and visitors. Due to constraints from environmentally sensitive wetlands in the area, available space may limit the roads to approximately 5m in width. Figures 7-1 and 7-2A illustrate the recommended GA access road layouts.

The future development area east of Airport Road will require vehicular access however internal access roads may not be required if Airport Road is diverted around the runway extension, to the east of the future development area. Tenants on the west side of the future development area will access the airside commercial lots via the existing Airport Road, and lots on the eastern side would be accessed by the Airport Road relocation. If Airport Road is closed, a new access road will be required on the east side of the development area to provide access.

An additional access road will be required to access the long-term development area at the western end of the Airport north of Runway 09-27. Construction of this road could be constrained by the presence of several wetland areas. In order to mitigate the environmental impacts, the future road could be constructed in the location of an existing gravel road as shown in Figure 7-2B.

5.5.2 Public Parking

Current areas available for public parking are limited. Visitors and airport employees utilizing the temporary Air Terminal Building have access to approximately 100 parking stalls at various locations in the vicinity. Several other parking areas exist at the Airport however they are privately operated and are not available for public use.

It is recommended that a public parking lot be provided for users and visitors to the new Public Facility. Specific requirements will vary depending on the agreed use and occupancy of the combined facility. An area for approximately 102 vehicular parking stalls is available adjacent to the future ATB/FBO access and frontage roads. This size of parking facility is expected to meet the needs of the facility throughout the planning horizons.

Development of an additional public parking area is recommended to support the future aircraft tie-down areas. Provision for 50 parking stalls should be provided in this area in the short-term to support the private aircraft operators as shown in Figure 7-2A.

5.6 Utilities and Services

5.6.1 Water Supply

Potable water is supplied to the Peterborough Municipal Airport through a 75mm high density polyethylene pipe from the Major Bennett Industrial Park north of the Airport. The potable water supply is directed through the Fire Pump Building which is located adjacent to the Wastewater Pumping station located on the east side of the current airport development area, adjacent to Airport Road. Records obtained from the Peterborough Utilities Commission indicate that approximately 500,000L of potable water is supplied to the Airport site on a monthly basis.

A recent report (2009) prepared by CH2M Hill indicates that the existing average daily flow of the potable water supply at the Peterborough Municipal Airport is approximately 16,566L per day, which is within the expected average day flow range that was originally anticipated.

Current firefighting facilities at the Peterborough Municipal Airport consist of a fire storage reservoir and two fire pumps with distribution piping and hydrants. Water used for firefighting is taken from the existing 75mm diameter potable water distribution main and stored for firefighting purposes. The water is no longer considered potable once it is stored in the reservoir. According to CH2M Hill, the existing capacity of the concrete fire storage reservoir is 440,000L which supports the present flow requirements related to the hydrant systems on the Airport property, in addition to the sprinkler/internal hose system within the Flying Colours facility.

Deficiencies

A recent analysis of the potable water supply system conducted by CH2M Hill predicts that the present potable water pumps are slightly below the expected fire year peak hourly flow; however, they appear to be close to being able to provide the capacity to support the existing developments plus the 5-year development program of an additional 5.65 Ha. The analysis recommends that long-term flow monitoring be conducted to further confirm the demands on the potable water supply in order to better determine whether the potable water supply is sufficient to support future developments. ***It is recommended that the potable water supply be closely monitored as development occurs within the various planning horizons.*** If and/or when it is found that the demand for potable water exceeds the supply, the system may have to be upgraded by supplying an additional 100mm watermain from the City of Peterborough.

CH2M Hill has indicated that it is difficult to determine the demand of the current firemain system in order to support future airport developments; however, they have noted that the current fire reservoir and pumps should be sufficient to meet individual building demands within the 5-year Airport Development Program currently underway.

As development occurs beyond the 5-year period, the capacity of the fire protection system should be further assessed.

CH2M Hill has also indicated that the capacity of the existing potable water supply may have to be increased to support future airport developments.

The capacity of the system could be increased by supplying an additional 100mm diameter potable watermain in addition to the existing 75mm main which connects to the City of Peterborough and supplies the entire airport property with water services.

Consultations with the Township of Cavan Monaghan indicate concerns with fire protection services for the General Aviation development area (Site 2). Consultations with the City indicate that the General Aviation development area is considered 'low risk' in terms of fire damage due to the building characteristics, and that additional fire protection could be provided to this area by using a relay pump from the future firemain to be constructed to support the new ATB/FBO area as discussed below.

Current Development Program

A review of the Airport Development Program indicates that potable water services have been provided to the aviation industrial development lots on the east of Apron I and across the apron extension area in preparation for future connections to the ATB/FBO facility and the aviation industrial lots to the west of Apron I. Provision of potable water services are planned for the ATB/FBO facility in 2009/2010, and further connections are expected to be provided to the aviation industrial lots on the west side of Apron I in 2011.

Over the short term, the newly installed water main and hydrants to the ATB/FBO area could be utilized to service the GA area. This could be done in conjunction with a Tanker shuttle program if required. As the GA is built out to its capacity, considerations should be made for hydrants at the north end of Taxiway 'C'. Additional potable water services will need to be provided to Sites 3 and 4, according to the planning horizons herein. Further information on future servicing requirements is presented in Chapter 7.

5.6.2 Sanitary Sewer

Sanitary sewage at the airport is processed by a wastewater pumping station and a forcemain constructed in 2002. All sanitary sewage at the Airport is collected by a gravity sewer system connected to facilities within the core development area which flows into the wet well of the wastewater pumping station. Wastewater is then conveyed from the pumping station into a 75 mm wastewater forcemain which discharges into the City of Peterborough wastewater treatment system.

Deficiencies

Analysis from CH2M Hill's Infrastructure Design Basis Report indicates that the existing average day flow per capita for the wastewater pumping station (112L/capita/day) is higher than the original average day flow (50L/capita/day) that the pumping station was originally designed for in 2002. Although the pumping station does not appear to have any operational issues, airport operations staff have been concerned that the pumps will be unable to keep up with the future developments planned within the Airport Development Program and Master Plan. A preliminary analysis by CH2M Hill suggests that the existing pumps within the wastewater pumping station are very close to capacity for short-term developments identified in the Development Program and Master Plan. CH2M Hill has recommended that the City of Peterborough further examine actual peak flows and monitor them over the long term as development occurs in order to better assess the capacity of the wastewater pumping system. According to the report, the size of the wet well and the associated sewage pumps may have to be upgraded as demand increases.

Current Development Program

A review of the Airport Development Program indicates that sanitary sewer services have been provided to the aviation industrial development lots on the east of Apron I and across the apron extension area in preparation for future connections to the ATB/FBO facility and the aviation industrial lots to the west of Apron I.

Provision of Sanitary sewer services for the ATB/FBO facility are planned in 2009/2010. Further connections are expected to be provided to the aviation industrial lots on the west side of Apron I in 2011. Additional sanitary sewer services will need to be provided to Sites 3 and 4 according to the planning horizons identified herein. Further information on future servicing requirements is presented in Chapter 7.

5.6.3 Storm Drainage

Storm drainage is currently provided via ditches and culverts. Stormwater generally collects in the ditches and culverts before flowing into Cavan Creek or other tributaries to the Otonabee River, depending on the location.

Deficiencies

As much of the Airport is impacted by stormwater flows related to the Cavan Creek and Otonabee River floodplain, stormwater management has been identified as a constraint to future development. Although all future airport developments are to be located above the minimum floodplain elevation, *it is recommended that a stormwater management study be conducted in the short-term in order to identify appropriate stormwater mitigation measures that support future airport developments.*

Current Development Program

The Peterborough Municipal Airport Development Program indicates that permanent drainage improvements to the east of Site 2 are planned for 2013.

5.7 Electrical and Communications

5.7.1 Electrical Distribution

Electrical power is provided to the Peterborough Municipal Airport by Hydro One. When new developments occur, the owner is required to absorb the infrastructure costs associated with providing electrical power, and Hydro One assumes ownership of the equipment and associated maintenance. While the exact power available at the Airport could not be readily determined, it is assumed that 13Kv, 3-phase power is available at the Airport.

Deficiencies

No deficiencies were identified with the current electrical distribution system at the Peterborough Municipal Airport during consultations. However any potential deficiencies would likely be known to, and fall under the jurisdiction of, Hydro One.

Requirements

Electrical power will need to be provided to the future airport development areas as required by the facility owners/operators. The electrical power infrastructure in the area and at the Airport should be sufficient to provide power to the new developments contemplated. Confirmation from Hydro One should be obtained prior to developments taking place.

5.7.2 Communications

Telecommunications services are provided to tenants by Bell Canada and Nexicom. These services are supplied to individual tenants and businesses at the Airport upon request, generally at the expense of the tenant.

Deficiencies

Although high speed internet connections are provided to many of the tenants within the current development area, stakeholder consultations have indicated that the infrastructure has reached capacity and additional connections cannot be provided. *It is recommended that additional high speed internet capacity be provided at the Airport for those tenants who wish to subscribe.*

Requirements

Additional communications facilities will need to be provided to the future development areas. Although all tenants may not require telephone and high speed internet connections, they should be made available by the communications provider(s).

5.7.3 Field Electrical Centre

The FEC supports all airfield power requirements. It is operating at capacity and, as noted in Section 5.1.2, will require engineering study and expansion to accommodate further airside development.

5.8 Aircraft Fuel Facilities

Aviation fuel is provided by an ESSO-branded dealer. Facilities to support aircraft fuelling include two fuel dispensers and two 45,000 litre underground fuel tanks south of Apron I. Two types of aviation fuel are available: Jet A1 and 100 Low-Lead (Avgas). Both types of fuel are provided through the dispensers and a truck (bowser) delivers Jet A1 fuel to aircraft operators upon request.

Deficiencies

No deficiencies were reported with the current aircraft fuel facilities at the Peterborough Municipal Airport.

Requirements

The current aircraft fuel facilities at the Peterborough Municipal Airport are expected to serve the short and long-term needs of the Airport and its tenants. However, if traffic at the Airport increases well beyond forecasted values as presented in Chapter 4, or if larger aircraft frequent the Airport, the size of the fuel tanks should be re-assessed to ensure that adequate storage capacity is provided to support local and itinerant aircraft operators.

5.9 Access Control and Security

Peterborough Municipal Airport currently incorporates access control and security measures in accordance with standards for certified airports.

Chain-link fencing with an approximate height of 2.4m acts as a security barrier between groundside and airside areas within the core development area. Several secure gates are placed at various locations within the core development area to provide vehicles and pedestrians with airside access.

Paige wire fencing is provided in low traffic areas to prevent unauthorized access from persons and wildlife. The paige wire fence is generally located on the Airport perimeter. Additional deer fencing is provided to prevent deer and other large wildlife from gaining access to the runway and other airside areas. This fence consists of three electrified wire strands oriented in a horizontal direction. All fencing described herein is illustrated in Figure 3-1.

The Airport does not have dedicated security staff located on-site; however, City staff and personnel employed by airport tenants are on-site during normal operational hours and are expected to maintain a security watch.

Deficiencies

Consultations with the Airport operator have not revealed any deficiencies with the access control and security measures in place at the Peterborough Municipal Airport. The mixing of vehicles and aircraft on Taxiway C has been described in Section 5.5.1. Transport Canada inspection reports indicate no noted access control or security deficiencies

Requirements

Additional fencing will be required in order to support the current Airport Development Program and any additional developments identified within this Plan. Illustrations of future fencing locations are provided in Section 5-1.

5.10 Emergency Response

All Emergency Response Services (ERS) are provided by the City of Peterborough.

In the event of an aircraft emergency, a small vehicle storage building located beside the temporary Air Terminal Building houses a Crash Foam Boss (CFB). The CFB has the capacity to hold 600 litres (158 gallons) of water and 720 litres (190 gallons) of foam.

Water for firefighting activities within the core and GA development areas is provided via a fire main within the core development area and tanker vehicles are used to provide fire suppression within the GA development area.

Deficiencies

ERS related to aeronautical activities is considered adequate to support current and future operations. However, consultations with the City of Peterborough and the Township of Cavan Monaghan suggest that non-aeronautical fire protection in the GA development area is considered inadequate. This is due primarily because a firemain is not provided in this area for fire suppression and water must be delivered by truck.

Requirements

The current level of aeronautical ERS is considered to be sufficient throughout all planning horizons presented herein. However, if the level of scheduled passenger services rises above 180,000 passengers per annum, the City of Peterborough may have to upgrade ERS capability pursuant to the requirements of the Canadian Aviation Regulations. Due to the lack of scheduled passenger services at the Airport, this is not expected to occur within the planning horizons.

5.11 Airport Maintenance

Airfield maintenance is undertaken by staff contracted by the City of Peterborough. An airport maintenance building is located within the Airport's core development area on the eastern side Apron I, adjacent to Airport Road. Two full-time staff members are responsible for airport maintenance, along with ad-hoc assistance from other airport staff when required. Airport maintenance equipment is owned by the City of Peterborough.

Airport maintenance activities typically include, but are not limited to the following tasks:

- ✈ grass cutting;
- ✈ snow clearing;
- ✈ safety inspections;
- ✈ wildlife management;
- ✈ fence maintenance;
- ✈ maintenance of airfield electrical systems and visual aids; and
- ✈ groundside and airside pavement maintenance.

Deficiencies

Consultations suggest that the current airport maintenance facility has reached the end of its life cycle and a new facility should be constructed in the short or medium term. The current facility is also considered to be in a prime location for airside commercial use.

Requirements

It is recommended that a new airport maintenance facility be constructed, possibly associated with and, in the vicinity of the new Public Facility. The new facility should be approximately 500m² in size, and be located to provide efficient access to the airside areas of the Airport. One potential location for the Airport maintenance facility is identified in Figure 7-2A.

5.12 Airport Environment

Environmental concerns are similar at many airports in Canada and in other parts of the world. Aircraft operations combined with adverse weather conditions require the use of chemicals as anti icing/de-icing agents for both aircraft and airport movement and maneuvering areas. Other environmental impacts can be associated with commercial and industrial facilities located at an airport, especially those requiring use of chemicals to in their business activities.

Special consideration needs to be given to airport activities that can adversely effect the environment, especially as most of the airport lies within a floodplain associated with Cavan Creek and the Otonabee River. The presence of several wetlands on the Airport property also warrants special considerations on airport operations and future development.

Key environmental issues are described below.

5.12.1 Aircraft De-icing

Glycol is a non-flammable petroleum product used for aircraft de-icing, similar to those used in automotive cooling systems. Since glycol has very good de-icing properties, it is usually mixed with warm water and applied to aircraft surfaces to remove ice, snow or frost using hand-held sprayers or a 'cherry picker' or a vehicle similar in nature.

Aircraft de-icing for private and commercial aircraft operators is undertaken by the ESSO fuel dealer at the Peterborough Municipal Airport. Aircraft de-icing is conducted using a pressure washer which heats the glycol before it is applied to the aircraft surface.

Deficiencies

The extent of de-icing activity is not known, but is believed to be relatively low due to the absence of scheduled air services at the Airport.

Designated areas for aircraft de-icing activities are not currently provided to mitigate environmental impacts on airport and surrounding lands.

Requirements

It is recommended that designated de-icing area(s) be provided on airside as shown in Figure 7-1. Designating specific areas will allow the Airport to collect the used glycol after it is applied to the aircraft surfaces.

Collection could be achieved by using a vacuum truck, or more economically, by grading a paved area so that used glycol is collected in a catch basin connected to a collection tank. Alternatively, the catch basin could be connected to the sanitary sewer system at the Airport which would then be treated by the City of Peterborough's sewage treatment facility.

5.12.2 Pavement De-icing and Anti-icing

Urea is used as an airport surface de-icing and anti-icing agent. Urea normally comes in pellet form and is applied to airside pavement surfaces using a spreader. Urea is considered to be effective at temperatures of -10°C to above freezing; however, the substance has two major drawbacks.

Because its major application is an agricultural fertilizer, it can end up in local streams, rivers or lakes due to natural runoff and encourage the growth of oxygen algae, lowering oxygen levels within the water. It can also elevate the nitrate levels in ground water and other water courses, creating a potential hazard for human consumption.

Many airports now use acetate runway de-icers which come in liquid applications. Potassium acetate and calcium-magnesium acetate are available and have been recognized as more environmentally friendly for airport use.

Consultations with the Airport operator have revealed that both urea and potassium acetate are being used as airport surface de-icing and anti-icing agents.

Deficiencies

No deficiencies were noted regarding pavement de-icing and anti-icing practices at the Peterborough Municipal Airport.

Requirements

Current pavement de-icing and anti-icing activities are considered to be adequate to serve the needs of the Airport throughout all planning horizons. The Airport should monitor potential environmental impacts of using urea and acetate products on the surrounding wetlands and watercourses and take preventative actions when considered necessary.

5.12.3 Wildlife Control

Transport Canada, as the national authority responsible for aviation safety, has the responsibility for the development of policies, standards and guidelines for wildlife control at airports as well as creating awareness of the problem within the aviation community in both the public and private sector

In 2006 Transport Canada's Wildlife Planning and Management Regulation came into force. Not all airports in Canada are required to prepare an Airport Wildlife Management Plan.

The regulation applies to any certified airport in Canada that meets one of the following criteria(s):

- ✎ The Airport receives commercial passenger-carrying aircraft operating under Subpart 4 or 5 of Part VII of the CARs with more than 2,800 annual movements;
- ✎ A wildlife strike has occurred when:
 1. A pilot reports a strike;
 2. Maintenance personnel report that aircraft damage is due to a wildlife strike
 3. Airport personnel report seeing a wildlife strike; and
 4. Airport personnel find wildlife remains on airside areas within 200' of a runway centreline and no other cause of death is identified.

- ✎ The Airport has had an incident where a turbine-powered aircraft collided with wildlife other than a bird and suffered damage, collided with more than one bird or ingested a bird through an engine;
- ✎ The presence of wildlife hazards, including those referred to in Section 322.302 of the Airport Standards – Airport Wildlife Planning and Management, has been observed in an airport flight pattern or movement area;
- ✎ There is a waste disposal facility within 15 km of the geometric centre of the Airport; and/or
- ✎ The Airport is located within a built-up area.

Peterborough's waste disposal facility is located within 15 km of the geometric centre of the Airport. This factor alone is considered to be a trigger for a Wildlife Management Plan under the regulations.

Airport employees patrol the grounds on a regular basis and utilize scare tactics to ward off animals whenever necessary. Although these are seen as wildlife mitigation measures, they are only considered as part of the overall wildlife management process under the regulations.

Consultations with the Airport operator have revealed that a Wildlife Management Plan has recently been submitted to Transport Canada and has been approved.

5.12.4 Wetland Areas and Watercourses

There are two specific areas which could be considered as environmental concerns. The floodplain associated with the Otonabee River and Cavan Creek, and the wetland areas located within and outside the Airport boundary.

While areas currently developed for aeronautical use have been constructed above the critical floodplain elevation of 190.61m ASL the areas available for airport expansion are largely designated as floodplain and will require significant fill to make additional land available for development.

Several areas of the Airport site, including some areas within the floodplain have been classed by the Ontario Ministry of Natural Resources (MNR) as Class 3 Wetlands. The area to the west of the current GA development area and to the north of Runway 09-27 is especially significant. MNR's designation has been applied in these areas to protect natural wetland and the associated habitat wildlife.

Wetland designation carries restrictions and prohibitions on building and development in order to protect wildlife and vegetation. Excluded from the MNR's designation are those areas including the runway, taxiway, aprons and existing core development area. Any additional developments identified within this Plan that are to occur outside of the current identified development areas may require further discussion and/or approval from MNR.

It is recommended that an Environmental Assessment of appropriate scope and a drainage study be undertaken in the short-term, prior to additional development within the designated floodplain and wetland areas.

5.12.5 Other Issues

Aging fuel storage tanks can be a potential concern. Consultations with the Airport operator indicate that the age of the 100 low lead and Jet A1 tanks is approximately 15 years, with a 25 year life span. At the present time these tanks have not been noted as an environmental concern but should be monitored to ensure they do not discharge petroleum products into the ground.

6.1 Current Inventory

The Airport's current development area is concentrated within the northeast quadrant of the site. Several land leases are currently in place and include the following 12 commercial businesses as identified in Figure 6-1:

- ✈ Aerotrike Aviation is a flight school that primarily serves the flex-wing ultralight training market, with a secondary focus on fixed wing ultralight aviation;
- ✈ Airtech Canada provides special purpose aircraft modifications, involving customized aircraft engineering design, and Transport Canada approvals;
- ✈ Angels of Flight provides and arranges air and ground transportation for ill and injured persons both on an emergency and non-emergency basis within Canada and throughout the world;
- ✈ Complete Aviation Services provides aviation fuel sales, customer service, ground transportation co-ordination, UNICOM services for inbound and outbound aircraft, and a hospitality centre for itinerant aircraft;
- ✈ Flying Colours Corporation's primary business area is related to aircraft completions, refurbishment and aircraft maintenance. Flying Colours is considered as the Peterborough Municipal Airport's anchor tenant;
- ✈ JCM Aerodesign specializes in aircraft modifications and repairs to fixed and rotary wing aircraft. They provide a wide range of engineering, manufacturing and modification services including EMS/medevac conversions and DHC-3/1000 Otter engine conversions;
- ✈ Kadex Aero Supplies specializes in the sale and servicing of a variety of aircraft components and parts. They primarily support the Raytheon/Beechcraft and Piper Aircraft brands;
- ✈ Ontario Air Turbines is a small operation that performs maintenance and overhaul work on the PWC PT-6 turbine engine;
- ✈ International Aircraft Support & Turbine Engines Sales are Transport Canada approved distributors providing complete parts support for the Beechcraft King Air & 1900 Airliner series aircraft and in all models of Pratt & Whitney PT6, JT15D and PW100 gas turbine engines;
- ✈ President Air Charter offers charter aircraft services to and from business destinations within Canada and the United States using twin engine, turbine aircraft;
- ✈ Rapid Aircraft Repair offers comprehensive full-line routine and major airframe and engine maintenance, modifications, and repairs. Their experienced staff provides complete inspection, maintenance and certification services on several aircraft types;
- ✈ Shield Source is a manufacturer of self-luminous egress signs with sign assembly, light output testing, and vacuum filling equipment available on-site;
- ✈ The Springville Café is located in the main terminal building. The restaurant features a full menu with a wide variety of sandwiches, burgers, hot meals, and an all day breakfast.
- ✈ Toronto Avionics is a Transport Canada approved organization that specializes in the installation and service of aircraft avionics systems;
- ✈ Transport Canada operates a satellite office located in the main terminal building;

- ✎ Vector Air Ltd. is an executive class air charter service providing non-scheduled domestic and transborder flights using executive Beechcraft King Air and Cessna Citation aircraft. Their clients include Federal and Provincial Government representatives, business executives, and corporate management teams based in cities such as Ottawa, Toronto, Montreal, Boston, New York, and Chicago; and
- ✎ W.M. Aeroflight provides General Aviation aircraft maintenance and repair services. The organization also offers flight training for Private and Recreational pilot licenses and ratings.

Kawartha Lakes Flight Centre began construction of a new hangar facility in 2008; however, development has halted and their future presence at the Peterborough Municipal Airport is uncertain. This facility and the accompanying lands might potentially be converted to an alternate aviation-related use.

Other land leases are used for private General Aviation (GA) use and government applications (such as the Ontario Provincial Police). Currently, all revenue from these leases is collected by the Airport and the associated municipal taxes are paid directly to the Township of Cavan Monaghan.

Airport lands beyond the east and west ends of Runway 09-27 are constrained by the presence of Cavan Creek and the Otonabee River and are not considered suitable for future commercial development, although some of these areas have been identified for extension of the runway.

There are potentially surplus airport lands to the south of Runway 09-27; however, much of this area is located within the Cavan Creek and Otonabee River floodplain which constrains development. These lands are subject to off-airport zoning restrictions and provide a long term buffer protecting airport land use and airport operations.

Airport commercial development focuses on developing land to the north of Runway 09-27 in order to encourage a critical mass of related businesses as well as to eliminate the need for aircraft runway crossings.

Lands are available to the east of Airport Road, and to the north of Runway 09-27. This 25 Ha land parcel has been identified for future Aviation Industrial use in the medium-term, in addition to supporting the extension of Runway 09-27 to the east. ***It is recommended that additional land between the existing property boundary and Airport Road be acquired.***

Land available for future development in the northwest quadrant of the current airport boundary is limited, as the property boundary is located in close proximity to the edge of the proposed full-length parallel taxiway supporting Runway 09-27. ***It is recommended that an additional land area be acquired in this area to support long-term development as identified in Chapter 7.***

Future development areas for commercial facilities within and outside the current airport boundary are identified in the Development Concept presented in Chapter 7.

6.1.1 Development Program 2009

The Peterborough Municipal Airport's Development Program focuses on upgrading some of the existing facilities and providing additional development areas to support immediate airport growth. Below is a summary of the developments scheduled to occur in 2009, based on the schedule provided by the City of Peterborough. Many of the infrastructure developments within the Program are currently on hold until Federal funding is approved.

- ✎ Realignment of Mel O'Brien Way – The Development Program indicates that a portion of Mel O'Brien Way is to be paved from Mervin Line to the former access road that previously crossed Apron I. In addition, a new road base will be constructed from the former access road, to the new ATB/FBO development site. The Master Plan supports these road developments.
- ✎ Apron I Expansion – Base preparation for the expansion of Apron I in a northerly direction occurred during 2008. The application of the top asphalt course is scheduled for 2009. The Master Plan supports this apron expansion.

- ✎ Pave General Aviation Access Road – The 2009 Development Program suggests that the General Aviation Access Road will be paved from the existing asphalt surface, to the north towards Mel O'Brien Way. The Program indicates that this road will be shared with Taxiway 'C'; however, this Plan recommends that this area be used strictly for a taxiway, and additional access roads be provided from Mel O'Brien Way to provide vehicular access for the GA facilities which would separate aircraft and vehicular traffic.
- ✎ Future Terminal Area Preparation – Base preparation for the new ATB/FBO site and the supporting apron is scheduled for 2009, in addition to providing municipal services. Base preparation for the future ATB/FBO parking area is also scheduled for 2009. The Master Plan supports these developments; however, slight modifications are recommended to the proposed layout as per the Development Concept presented in Chapter 7.
- ✎ General Aviation Lot Preparation – Phase 2 of the General Aviation Lot preparation program is also scheduled for 2009. Significant amounts of fill are being provided in this area to raise building elevations above the maximum floodplain elevation to mitigate potential flooding issues. The Master Plan supports the GA lot preparation activities; however, it is recommended that they be conducted as per the Development Concept illustrated in Chapter 7.
- ✎ Private Hangar Acquisitions – The 2009 Development Program indicates that the private hangars to the southwest of Apron I will be acquired in order to promote additional Aviation Industrial developments. The acquired hangars are expected to be relocated to the General Aviation area currently under development.

- ✎ Aircraft Tie-Down Relocation – The Peterborough Municipal Airport has indicated that the current aircraft tie-down area will be relocated in order to support future Aviation Industrial developments. However, the area selected for the relocation by the City of Peterborough could interfere with apron developments to support the future ATB/FBO. This Plan recommends that the aircraft tie-down area be relocated to the southwest of the current GA development area, between Taxiway 'C' and the future parallel taxiway as illustrated in the Short and Medium Term Development Concept presented in Chapter 7.

6.1.2 Development Program 2010

The following developments are scheduled to occur in 2010 according to the Peterborough Municipal Airport's current Development Program:

- ✎ Mel O'Brien Way Paving – The final portion of Mel O'Brien Way is scheduled to be paved in 2010.
- ✎ Terminal Area Preparation – The new apron and vehicle parking area supporting the ATB/FBO is scheduled to be paved in 2010.
- ✎ Apron I Expansion – The Development Program indicates that Apron I will be further expanded and paved to the north towards Mervin Line. The Master Plan supports this development.
- ✎ General Aviation Lot Preparation – Continuation of the General Aviation lot preparation is scheduled to continue in 2010. The Master Plan recommends that this area be developed according to the Development Concepts presented in Chapter 7, including dedicated vehicular access roads and the provision of non-aviation commercial development land parcels.
- ✎ Industrial Lot Preparation – The 2010 Development Program indicates that industrial lot preparation west of Apron I will occur during this time frame, primarily to support the future Flying Colours facility. The Master Plan supports this development.

- ✈ New ATB/FBO Construction – A new ATB/FBO facility is planned for construction in 2010 at the south end of the realigned Mel O'Brien Way. The Master Plan supports this development provided it is configured according to the Development Concept presented in Chapter 7.

6.1.3 2011 Program

The Development Program indicates that the following items will be constructed during 2011:

- ✈ Ramp Extension Servicing – Municipal services will be extended to support future Aviation Industrial facilities on the western side of Apron I. The Master Plan supports this development.
- ✈ Industrial Lot Preparation – Additional Aviation Industrial development parcels will be prepared on the western edge of Apron I from the 2010 lot preparations to the north towards Mervin Line. Additional non-aviation commercial development lots are also scheduled for development to the north of the future ATB/FBO facility. The Master Plan supports the development of the Aviation Industrial Development Parcels; however, the non-aviation commercial developments should be positioned as per the Development Concept presented in Chapter 7.

Approved development beyond 2011 includes additional industrial lot preparations on the west side of Apron I, General Aviation and industrial lot preparations, and drainage improvements within the environmentally sensitive area between the core development area and the General Aviation development site.

6.2 Airport Industrial

Activities defined under the Airport industrial category generally include commercial businesses that provide some, or a combination of the following services:

- ✈ Aircraft Component Overhaul Services;
- ✈ Avionics Manufacturing and Repair
- ✈ Aircraft Painting and Interior Finishing; and
- ✈ Aircraft Composites Manufacturing.

The above list is not exhaustive; however, it gives a good representation of some of the Airport industrial activities that are currently being conducted at the Peterborough Municipal Airport, as well as some potential future opportunities for the Airport as identified in the Business Case for Infrastructure Development. Consultations with the Airport operator suggest that there may be interest in developing more airport industrial activities in the short to medium term in order to increase the economic benefit of the Airport and create additional employment.

Airport industrial development areas are identified to support future businesses wishing to locate at the Airport, primarily surrounding Apron I and to the east of Airport Road. These areas are identified for expansion in the short and medium-term with adequate capacity to support airport industrial businesses throughout all planning horizons.

6.3 Aircraft Maintenance

Aircraft maintenance activities include several support functions, some of which are currently being carried out at the Peterborough Municipal Airport. Typical aircraft maintenance activities include:

- ✈ Maintenance Repair and Overhaul (MRO) Activities, including maintenance for scheduled airlines and maintenance for corporate aircraft;
- ✈ Engine Overhaul;
- ✈ General Aviation aircraft inspections and routine maintenance; and
- ✈ Airframe inspections.

The City wishes to expand the aircraft maintenance services at the site by attracting additional businesses to the Peterborough area as noted in the Business Case for Infrastructure Development. Existing businesses are expected to expand and new businesses to be attracted to the Airport once major infrastructure projects are completed.

Sufficient area has been identified to support the growth of the aircraft maintenance sector at the Peterborough Municipal Airport.

The development areas situated adjacent to Apron I and the future development parcels identified to the east of Airport Road are ideal to support aircraft maintenance activities through all planning horizons.

6.4 General Aviation

General Aviation (GA) is defined as civil aviation activities operated by individuals, organizations, and businesses providing the following services:

- ✈ Public charter aircraft operations;
- ✈ Private charter operations serving the regional air transportation requirements of companies, organizations, and government departments;
- ✈ Private aircraft operations for business or personal use;
- ✈ Flight training;
- ✈ Public and private helicopter operations;
- ✈ Support activities for the above including repair, sale and inspection of aircraft and associated support material;
- ✈ Supply fuel and oil;
- ✈ Private office and hangar space for GA operators; and
- ✈ Medevac services.

A review of historical aircraft movements in the private category suggests that the amount of GA operators at the Airport has declined slightly over the past 10 years, but activity is expected to rise in the short term.

General Aviation areas are currently being developed as part of the Peterborough Municipal Airport's Development Program, primarily to the northwest of the core development area adjacent to Taxiway 'C'.

These areas are also identified for expansion through short and medium term planning horizons in the Master Plan. Current and future land parcels will provide small and medium size hangar lots and capacity for aircraft tie-down developments. Adequate capacity is also provided for flight training facilities throughout all planning horizons.

6.4.1 Business and Corporate Aviation

Business and corporate aviation activities are generally related to the transportation of company executives or large charter groups, such as sports teams. These individuals usually own or charter an aircraft for air transportation. Analysis suggests that business and corporate aviation activities are occurring at the Peterborough Municipal Airport.

A combined ATB/FBO facility would be ideal to support these types of activities. According to Airport Development Program, construction of this facility is expected in the short term.

6.4.2 Flight Training

The Peterborough Municipal Airport is well positioned to attract commercial flight training and to market the expanded airside infrastructure, and high quality of life in the Peterborough region. Educational facilities could be located at the Airport within the development areas, perhaps in coordination with Fleming College or other post secondary institutions in central and southern Ontario, such as Seneca College.

6.4.3 Recreational and Experimental

There are several recreational and experimental aircraft operators and supporting businesses located at the Peterborough Municipal Airport. Development areas to support additional facilities related to recreational and experimental flying are provided within the Master Plan, primarily within the existing General Aviation development area to the west of Apron I.

6.4.4 Natural Resource and Public Service

Aircraft operations related to natural resource and public service activities generally include firefighting, law enforcement, and other government applications.

Areas are provided within the Master Plan to support these activities, primarily within the GA development area, and within the long term Corporate GA development area to the north of Runway 09-27, and to the west of the current core development area.



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Client



City of Peterborough

Title

CORE AREA PLAN (2009)

Legend

— SECURITY FENCE
— DEER FENCE

Figure No.

6-1

Drawn By

HK

Approved By

RAM

Date

September 2009

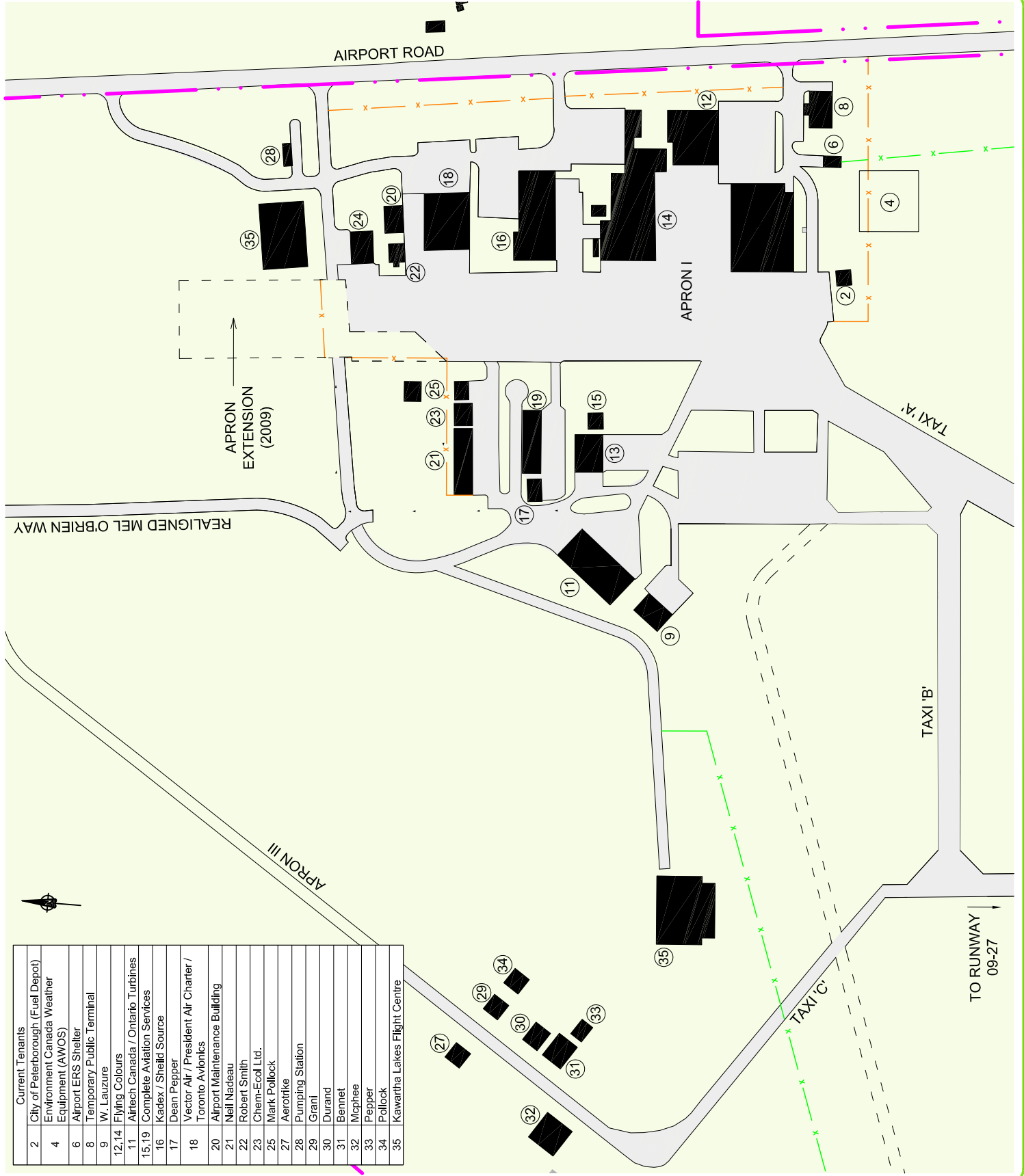
Scale

N.T.S

Filename

AIRPORT H.K.

Current Tenants	
2	City of Peterborough (Fuel Depot)
4	Environment Canada Weather Equipment (AWOS)
6	Airport ERS Shelter
8	Temporary Public Terminal
9	W. Lauzure
12,14	Flying Colours
11	Airtech Canada / Ontario Turbines
15,19	Complete Aviation Services
16	Kadex / Sheld Source
17	Dean Pepper
18	Vector Air / President Air Charter / Toronto Avionics
20	Airport Maintenance Building
21	Neil Nadeau
22	Robert Smith
23	Chem-Ecol Ltd.
25	Mark Pollock
27	Aerotrike
28	Pumping Station
29	Grani
30	Durand
31	Bennet
32	McPhee
33	Pepper
34	Pollock
35	Kawartha Lakes Flight Centre



6.5 Commercial Opportunities

6.5.1 Aeronautical

A commercial opportunities scan of potential new lines of business is presented in Table 6-1. The scan is based on industry research and knowledge, and consultations with users and management. It considers various potential opportunities, examines local competition, and identifies current interest based on consultations.

Although the Airport offers some services similar to those of an FBO, facilities to support the operation are limited. Development of a full service FBO is considered to be a good opportunity for growth provided that a comprehensive set of high quality services are provided, and appropriate launch tenants and clientele are secured.

Several aeronautical-related commercial opportunities were also identified for the Peterborough Municipal Airport in the Business Case for Infrastructure Development (LPS AVIA 2008). These opportunities are presented below:

- ✈ Aerospace Education and Training Campus
- ✈ Component Overhaul Shops
- ✈ Composites Centre of Excellence
- ✈ Engine Overhaul
- ✈ Upgraded Flight Training

It is suggested that the Airport pursue the opportunities listed as medium-high to high within Table 6-1, in addition to the opportunities identified within the 2008 Business Case for Infrastructure Development. Pursuing these lines of business could stimulate airport activity and growth, and increase overall revenue streams through various aeronautical charges and land leases.

6.5.2 Non-aeronautical

Non-aeronautical opportunities are identified separately from aeronautical to highlight the importance of diversifying airport commercial activities and land uses. Peterborough Municipal Airport has land available for development not directly related to airport operations; however, attracting these lines of business could be difficult. Since these types of development may not be considered integral to aviation, Transport Canada's jurisdiction may not apply and the lands could be subject to the conditions within the Township of Cavan Monaghan's Land Use By-laws that restrict non-aviation related developments at the Airport.

It is recommended that the Township of Cavan Monaghan consider changes to relevant bylaws permitting less restrictive growth of industrial businesses on airport lands.

Table 6-1 – Aeronautical Commercial Opportunities

Potential Use	Local Competition	Local Interest	Constraints	Possibility
Fixed Base Operator	Yes	Possible	None	High
Aircraft Hangars	Yes	Possible	None	Medium-high
Flying Training	Yes	Possible	None	Medium-high
Aircraft Maintenance	Yes	Possible	None	Medium-high
Aircraft Overhaul	Yes	Possible	None	Medium-high
Aircraft Assembly	No	Possible	None	Medium
Air Cargo Facility	No	Possible	None	Medium
Flight Kitchen	No	No	None	Low

The Peterborough Municipal Airport is considered as an Air Industrial Park and development lands should be reserved for aeronautical uses whenever possible. Non-aeronautical revenues could be increased by providing outdoor advertising, a rental car facility, air terminal advertising and a restaurant.

Outdoor advertising activities could be initiated along Airport Road, and on the northwest edge of the property boundary adjacent to Highway 115, potentially in the form of billboards or other types of signage. A small car rental facility could also be placed at the Airport to serve the future ATB/FBO and itinerant aircraft visiting the Peterborough area.

Although a full-size rental car facility may be too large for the Airport, arrangements could be made with a car rental agency to position a small number of vehicles at the Airport that can be rented based on pre-arrival arrangements.

Non-aeronautical activities at the Peterborough Municipal Airport should be located based on highest and best use principles.

Best airport planning practices allow aeronautical land use priority over non-aeronautical uses. For example, development lots with access to airside infrastructure are intended for aeronautical use. By definition, non-aeronautical commercial activities (also referred to as groundside commercial) do not require direct access to airside infrastructure.

The Development Concept presented in Chapter 7 reflects highest and best use principles.

6.6 Aviation Commercial Land

6.6.1 Demand

Demand for development land at the Peterborough Municipal Airport has continued sporadically for many years, with a recent increase in 2008. In the recent past, two large land areas have been developed in the General Aviation development area, adjacent to Taxiway 'C'.

These areas are capable of accommodating approximately 30 small to medium-sized lease areas, including the land parcel where the Kawartha Lakes Flight Training hangar has been partially developed.

Nine additional Airside Industrial lots are currently being made available for lease for the immediate and short-term. Consultations with the Airport operator suggest that many private hangar operators have been waiting to lease additional lands until the GA development area was prepared, and Taxiway 'C' was paved. It is estimated that in 2008, approximately 8 new leases were established, including one Airside Industrial lease, and seven GA leases.

In addition, 8 GA hangar relocations are expected to take place in 2009 to allow for the expansion of the Flying Colours hangar and other support facilities related to their operation.

Accurate measures of historical land uptake by commercial interests beyond the recent past are generally difficult to determine.

Historical land uptake in the GA and Airside Industrial categories is estimated at approximately one lot per year (before 2008) based on consultations.

Future demand projections for aviation commercial land are difficult to predict. Several assumptions can be made to determine an approximate land uptake rate consistent with the planning horizons. It is assumed that General Aviation lots will be leased at a rate of one parcel per year through the short and long terms, and two lots per year within the medium term, increasing due to the potential closure of Buttonville Airport. Demand for Airside Industrial land is estimated at 1 new major lot per year throughout all planning horizons, and relies on a strong international marketing program by the Airport.

6.6.2 Supply

Analysis of the Airport site has shown that adequate land is available for aviation commercial development (including General Aviation and Airside Industrial) within the current airport property. Additional aviation commercial land parcels have been identified for the medium and long terms within the Development Concept presented in Chapter 7. These additional parcels, combined with development areas currently being prepared for immediate and short term development are expected to meet the commercial needs of the Airport beyond the established planning horizons.

The proposed Development Concepts divide the aviation commercial land into 4 sites. Aviation commercial development parcels (including General Aviation and Airside Industrial) include the following.

✈ Site 1, situated within the Airport's existing core development area has been selected for medium to large scale Aviation Industrial uses, such as hangar developments, Maintenance Repair and Overhaul (MRO) and other medium to large-scale commercial businesses.

✈ Site 2 is located on the western side of the Airport's existing core development area. This area has been identified for small to medium-sized GA establishments, preferably for small to medium-sized hangar developments.

Some Groundside Commercial areas are also located within Site 2, as described further in Section 6.8.2. Development lots within Site 2 are expected to be saturated by the beginning of the long term.

✈ Site 3 has been established to the east of the current core development area and Airport Road and has been identified based on available land predominantly owned by the City. Future developments in this area should include medium to large-scale Airside Industrial uses, such as hangar developments, MRO, and other medium to large-scale commercial businesses. Development lots within Site 3 are expected to meet the needs of the Airport throughout and beyond the long-term. Due to a shortage of Groundside Commercial land (described in Section 6.8), some of these lots could be used for non-aviation commercial purposes, preferably at the northern end on the site.

✈ Site 4 is located to the west of the core development area and to the north of Runway 09-27 and the future parallel taxiway connecting to the threshold of Runway 09. Additional development lots have been identified in this area to accommodate Corporate and General Aviation including government uses (medevac and police), and flight training organizations. The amount of GA land provided by Site 4 is expected to meet the needs of the Airport beyond the long-term.

Varying degrees of expansion to roads, water supply, gas, storm and sanitary services may be required to service the development areas identified above. Specific requirements are identified in Chapter 7.

6.7 Non-Aviation Commercial

6.7.1 Demand

The Airport does not currently have any properties specifically reserved for non-aviation commercial uses within its boundary, although some tenants are currently leasing space in areas designated for Airside Industrial use that do not require use of many of the Airport's facilities.

Demand for non-aviation commercial or Groundside Commercial land is also difficult to measure. However, consultations with officials from the City have indicated that there is interest in developing some non-aviation commercial land on the Airport site at this time.

It is expected that the overall demand for non-aviation commercial land will increase as the aerospace industrial park grows. It is assumed that approximately one non-aviation commercial lot will be leased every two years. If the actual number is found to be greater, additional non-aviation commercial land could be provided outside the current boundary, possibly north of the Airport where land is currently listed for sale.

As land north of the Airport is located outside the Otonabee River and Cavan Creek Floodplains development approvals may be easier to obtain.

6.7.2 Supply

The Development Concept identifies one area for non-aviation commercial land development opportunities.

✈ Site 2 provides a total of 5 Groundside Commercial parcels available for lease, with direct access from the realigned Mel O'Brien Way and the future General Aviation area access road. These development lots have high visibility from vehicular traffic and would be ideal for developments that do not require direct access to the Airport's runway, taxiway and apron system.

Based on the projected land absorption rates, additional groundside commercial lots may be required in the long term.

These additional lots could be provided by acquiring land to the north of the current airport site as indicated above, or some of the airside commercial development lots in Site 3 could be used for this purpose, depending on approvals from the Township of Cavan Monaghan.

A limited amount of expansion to water, gas storm and sanitary services will be required to service these Groundside Commercial development parcels, as per the recommendations in Chapter 7.

6.8 Development Strategy

The development strategy is based on providing adequately serviced lots to potential airport tenants as demand occurs.

The increase in Aviation Industrial and General Aviation activities at the Peterborough Municipal Airport indicate that developments may also occur in the short to medium term. Subsequent developments are expected to follow in the medium to long term or beyond.

Table 6-3 provides a phasing strategy based on forecasted airport growth and identified land absorption rates described in previous sections. The program identifies each development parcel, the available areas, and an estimated time frame for development.

It is important to note that if demand is significantly higher than forecasted levels, lands may have to be developed sooner. Conversely, if actual demand is lower than forecasted parcels should be developed within longer planning horizons.

Table 6-2 – Commercial Land Development Strategy

Parcel	Existing Area	Short Term		Medium Term		Long Term	
		Area	Lots	Area	Lots	Area	Lots
Existing	7.7 Ha	-					
Site 1 (Airside Industrial)	-	3.0 Ha	6	1.0 Ha	2	-	-
Site 2 (GA Airside)	-	0.3 Ha	6	0.6 Ha	12	-	-
Site 2 (Groundside)	-	1.4 Ha	2	1.1 Ha	2	0.4 Ha	5*
Site 3 (Airside Industrial)	-	-	-	2.0 Ha	4	4.5 Ha	9**
Site 4 (Corporate GA)	-	-	-	-	-	4.5 Ha	9***
Totals	-	4.7 Ha	14	4.7 Ha	20	9.4 Ha	23

*Shortage of Groundside Commercial lots in long term (4 additional lots required)

** Surplus of 8 Aviation Industrial lots in long-term

*** Surplus of 7 Corporate GA lots in long-term

7.1 Strategy

The Development Concepts presented for the short, medium and long term are expected to meet the current and future airside, air terminal and groundside requirements, and improve identified operational deficiencies at the Airport. The Master Plan protects sufficient land to accommodate growth beyond the long term planning horizon.

The Master Plan provides for immediate expansion of the runway and a partial parallel taxiway, development of a new public apron and terminal for itinerant and industrial traffic, and expansion of general aviation areas. The Master Plan provides in the medium term for subsequent development of a second aerospace industrial area, and additional general aviation amenities. In the long term the Master Plan provides for a full length parallel taxiway system serving increasing levels of traffic and making available additional commercial land for aviation and aerospace industrial use.

The Airport Master Plan is illustrated in Figure 7-1.

7.2 Phased Development

Development is recommended in phases to support current traffic levels and forecast growth. Airside development is recommended in addition to groundside developments including infrastructure such as access roads, development lots, and parking areas. These developments need to occur as activity levels at the Airport increase in order to maintain an efficient system.

The Phased Development Program in Table 7-1 identifies airside, groundside, ATB and other developments within the defined planning horizons.

The Phased Development Concept is illustrated in Figures 7-2a and 7-2b. The recommended configuration of airside, groundside and other airport infrastructure is provided based on highest and best use airport planning principles.



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City of Peterborough

Title

MASTER PLAN

Notes

Existing Boundary
Additional Land
Required

Figure No.

7-1

Drawn By

HK

Approved By _____

RAN

Date _____

September 2009

Scale

N.T.S

Filename

AIRPORT H.K.

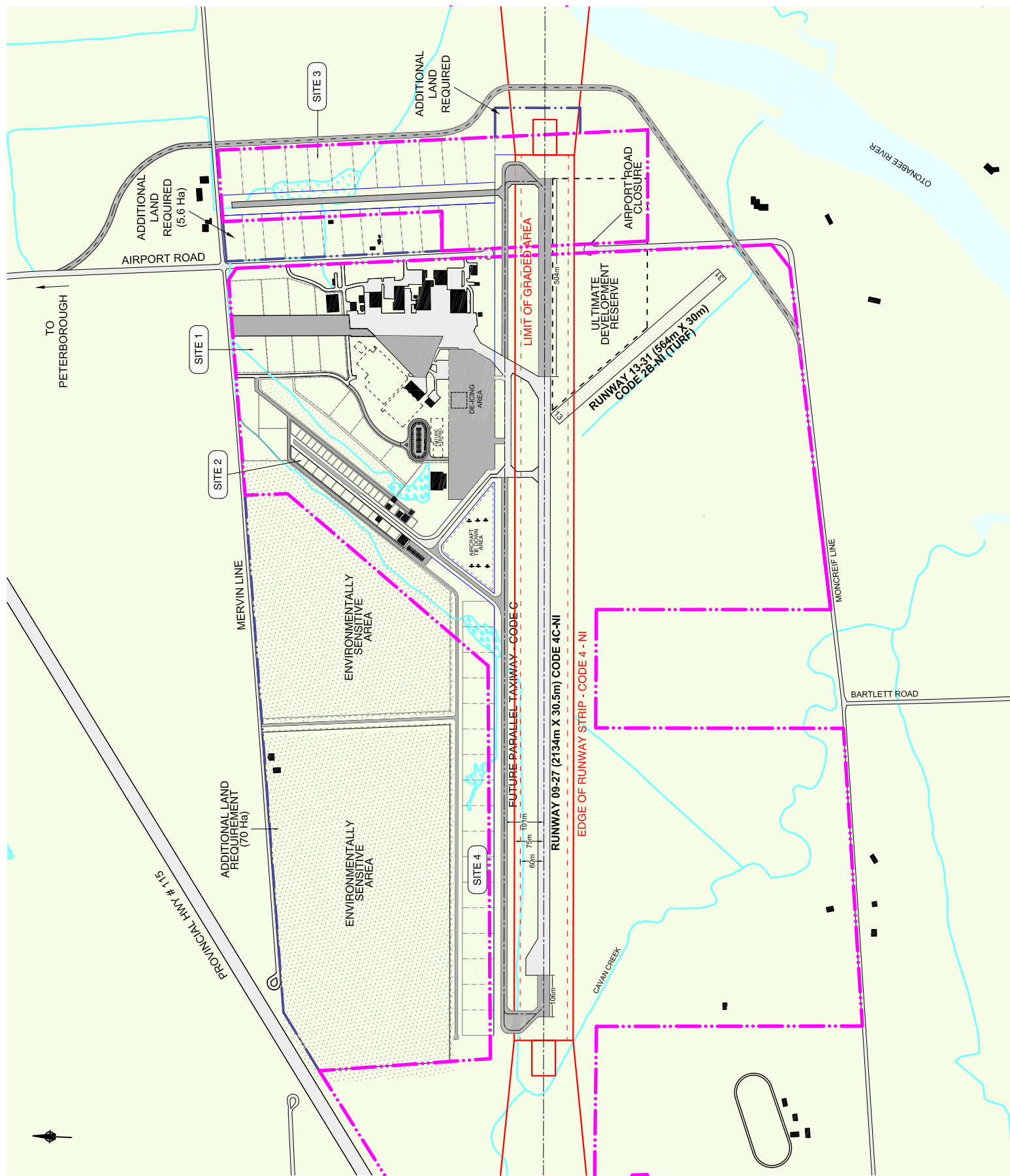


Table 7-1 --- Phased Development Program

Peterborough Municipal Airport

Year	Development Period	Airside	Groundside	ATB and Other
2009 - 2014	Short-Term (2-5 yrs)	✂️ Extend Runway 09-27 to 2,134m	✂️ Relocate or Close Airport Road	✂️ Initiate Environmental Assessment Process for Short and Medium Term Developments
		✂️ Extend Taxiway 'B' to New Threshold of Rwy 27	✂️ Industrial Lot Preparation East of Apron I	✂️ Private Hangar Acquisitions/Relocation
		✂️ Expand Apron I to North	✂️ Service Industrial Lots West of Apron I (Site 1)	✂️ Develop ATB/FBO Facility and Parking Area
		✂️ Strengthen Existing Runway	✂️ Realignment of Mel O'Brien Way	✂️ Permanent Drainage Improvements (Sites 1 & 2)
		✂️ Strengthen Existing Taxiways 'A' & 'B'	✂️ Ramp Extension Servicing to Mervin Line	✂️ Purchase Additional Lands East of Airport Road (Site 3)
		✂️ Strengthen Apron I	✂️ General Aviation Lot Preparation	✂️ Commission Airport Marketing Study
		✂️ Construct Apron II	✂️ New Terminal Area Servicing	✂️ Commission Airport Governance Study
		✂️ Relocate Aircraft Tie-down Area	✂️ Provide Aircraft Tie-down Vehicle Parking	
			✂️ Construct Access Roads Behind GA Lots (Site 2)	
			✂️ Prepare Groundside Commercial Lots (Site 2)	
2015 - 2020	Medium-Term (5-10 yrs)	✂️ Construct Code C Taxiway to Service Industrial Lots -- (Site 3)	✂️ Prepare Industrial Lots -- (Site 3)	✂️ Update Forecasts
		✂️ Extend Apron I	✂️ Service Industrial Lots -- (Site 3)	✂️ Acquire Additional Land to Support Development of Site 4
		✂️ Extend Apron II	✂️ Construct New Airfield Maintenance Building	
2021 - 2030 and	Long-Term (10-20 yrs)	✂️ Extend Taxiway 'B' to Rwy 09 Threshold	✂️ Long-Term Development Area Lot Preparation (Site 4)	✂️ Expand ATB if necessary
			✂️ Construct New Access Road From Mervin Line to Long Term Development Area (Site 4)	
			✂️ Service Long Term Development Area (Site 4)	



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Client

City of Peterborough

Title

PHASED DEVELOPMENT CONCEPT

Notes

1. Preliminary
2. All dimensions approximate
3. Typical lot sizes shown

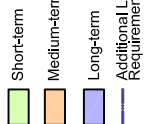
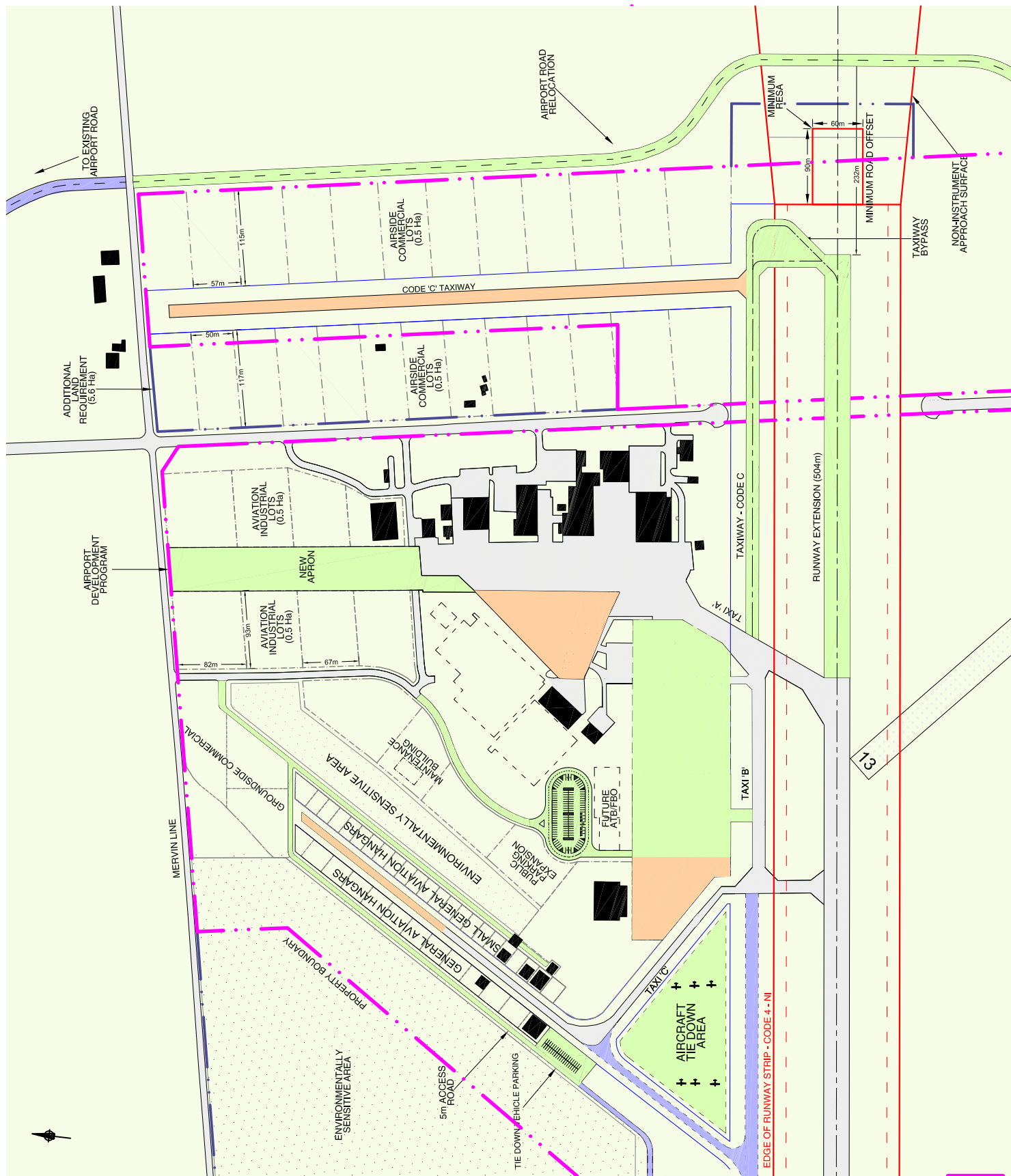


Figure No.	7-2 A
Drawn By	HK
Approved By	RAM
Date	September 2009
Scale	N.T.S
Filename	AIRPORT H.K.





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Client



City of Peterborough

Title

PHASED DEVELOPMENT CONCEPT

Notes

1. Preliminary
 2. All dimensions approximate
- Ultimate/Long-term
 - Medium-term
 - Short-term
 - Additional Land Required

Figure No.

7-2 B

Drawn By

HK

Approved By

RAM

Date

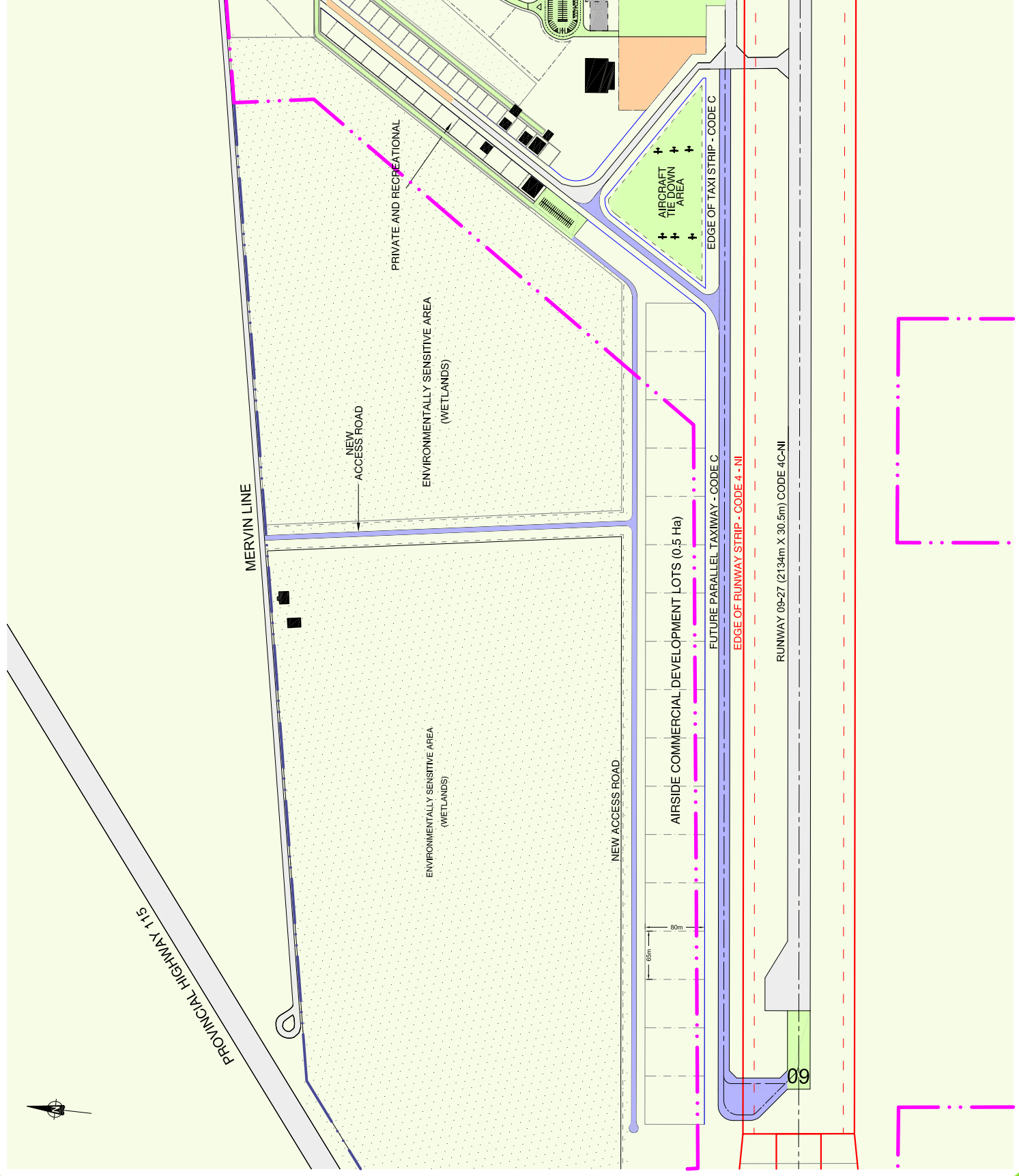
September 2009

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7.3 Utilities and Services

In order for the proposed development strategy presented in the Master Plan to take place, additional development areas will require municipal services such as potable and firefighting water, sanitary sewer, hydro, gas and telecommunications.

An Airport Servicing Plan is presented in Figure 7-3 and illustrates the proposed layouts and associated infrastructure. The additional requirements are described below.

7.3.1 Servicing of Future Expansion

The following servicing scenarios are based on the projected time frame for each of the proposed expansion areas.

Short Term – Sites 1 and 2

The current Airport Development Program presented by the City of Peterborough indicates that municipal services will be expanded to accommodate the additional aviation industrial development lots to the west of Apron I, and to the future ATB/FBO development area. This expansion program is expected to include 75mm diameter potable water installations, 300mm diameter fire mains, and 200mm diameter sanitary sewers. In addition, these areas will be serviced by natural gas, telecommunications and electrical power. Costs presented within this Plan include approximately \$10,000 per development lot for natural gas, telecommunications and electrical services.

The majority of Site 2 is expected to consist of small General Aviation hangars that only require electrical and telecommunications services; however, groundside commercial development lots have also been identified in this area. The groundside commercial areas within Site 2 will require services such as water, sanitary sewer and fire protection with capacities similar to those noted for Site 1 above. These services should be provided within the ramp extension servicing program slated for 2011.

Medium Term – Site 3

Potable water and fire protection can be achieved by looping the existing 75mm diameter potable water and 300mm fire mains from Airport Road, through the proposed Code C taxiway corridor. The future potable water main should be expanded to measure 100mm in diameter.

Sanitary sewer servicing can be provided to Site 3 by constructing a 200mm gravity sewer within the future Code C taxiway corridor running from north to south to the north limit of Taxiway 'B', where a small pumping station is proposed with a 100mm forcemain discharging westerly to the existing 200mm sanitary sewer on Airport Road.

This site can be serviced with underground natural gas, telecommunications and electrical power by looping from existing facilities located on Airport Road, via Mervin Line and the future Code 'C' taxiway.

Long Term – Site 4

The proposed corporate aviation development lots within Site 4 will require potable water, fire protection, sanitary services, gas electrical power and telecommunications.

This site can be serviced with potable water by extending the existing 75mm water line to be provided near the proposed new terminal building in a westerly direction along the future access road corridor. A 100mm potable water service is recommended, in addition to a 300mm firemain. In addition, a new 100mm diameter potable watermain should be looped along Mervin Line from Site 1, and then southerly along the future access road to a proposed fire and potable water booster station and reservoir located in Site 4. Because of the distance from the existing booster station located adjacent to Airport Road (Site 1) it is likely that an additional booster station and reservoir will be required at the intersection of the north/south and east/west access roads supporting Site 4.

Sanitary sewer servicing can be provided to developments within Site 4 by placing a 200mm local sewer along the future access road corridor. Development lots will each be serviced with a 150mm diameter sanitary lateral. The local sewer would be connected to a proposed pumping station located adjacent to the booster station and reservoir identified above. The pumping station will discharge to the proposed 200mm diameter sanitary sewer connected to the future ATB/FBO via a 100mm diameter forcemain. Provisions have been made within the Financial Forecast to provide development lots in this area with natural gas, telecommunications and electrical power services similar to those in Site 3.

Site 4 will require a large expenditure in order to provide municipal services described above. An expenditure of approximately \$50,000 is estimated to provide electrical power to the pumping and booster stations supporting Site 4.

7.3.2 Flow Projections

This section estimates the projected sanitary flows and water demand resulting from the proposed expansion areas as identified within this Plan.

The criteria for the flow calculations will be based on the gross areas of the proposed expansions and theoretical unit flow projections for commercial zones. The recent CH2M Hill report indicates that current flow volumes are difficult to determine and that the City of Peterborough should closely monitor current flows and assess the capability of the services to handle additional developments on a site-by-site basis.

For the purposes of this Master plan, the following criteria will be applied in order to estimate future flows based on the 2009 CH2M Hill report:

Potable Water Demand

- ✎ Average Demand: 6m³ per hectare per day;
 - ✎ Maximum Day Demand: 2.0 times average;
 - ✎ Peak Hourly Demand: 2.8 times average*
- *Based on 90 employees per hectare at 66L/capita/day

Fire Protection Services Demand

- ✎ Hydrants: 9,000 L/min at minimum 140kpa (20.3 psi)
- ✎ Individual building requirements to be assessed separately.

Fire flow requirements must meet the current Fire Underwriters Survey and the local Building Code. The level of fire protection for each building will have to be established at the Building Permit stage (some buildings may require a sprinkler system).

Sewage Flows

- ✎ Average Demand: 10m³ per hectare per day;
- ✎ Peaking Factor: 2 times average (max day);
Peaking Factor: 2.8 times average (peak hour);
- ✎ Peak Infiltration Allowance: Included in coverage demand of 112 L/capita/day

Based on the above noted criteria, the flow projections for each of the proposed expansion areas are calculated as follows:

Table 7-2 – Water Demand

Site	Gross Area (Ha)	Average Day (m3/day)	Maximum Day (L/day)	Peak Hourly (L/min)
2	2.0	12	24,000	24
3	12.5	75	150,000	146
4	9	54	108,000	105

In addition to the maximum day demand, the water network should be capable of providing adequate fire flows to meet the guidelines established by the local authorities. The system should be able to supply at least one fire hydrant (9,000 L/minute at 140 kpa pressure), but the City may require a higher level of fire protection (i.e. two or more hydrants operating simultaneously).

7.2.3 Future Drainage

Drainage from the proposed expansion areas is expected to follow the current patterns. It will be achieved by installing road side ditches along the new airport access roads, and underground storm sewers beneath proposed taxiways. The existing underground storm sewers along the runways and taxiways can also be extended within the expansion timeframes identified within this Plan. Outflow from the site will continue to be via Cavan Creek and other existing minor tributaries to the Otonabee River. In addition to the permanent drainage improvements slated for 2013, this Plan recommends that a complete drainage study be commissioned taking into account the floodplain impacts and existing and proposed developments.

Table 7-3 – Sanitary Flows

Site	Gross Area (Ha)	Average Daily Flow (m3/day)	Infiltration (L/s)	Total Peak Hourly Flow (L/s)
2	2.0	20	Incl.	39
3	12.5	125	Incl.	243
4	9	90	Incl.	175



TO
PETERBOROUGH

PROVINCIAL HWY # 115

POTABLE WATER (100mm) **LONG-TERM**

NEW WATER (75mm), FIRE PROTECTION
(300mm), AND SANITARY (200mm) **SHORT-TERM**

MERVIN LINE

RAMP EXTENSION SERVICING
SHORT-TERM

TERMINAL AREA SERVICING
SHORT-TERM

ENVIRONMENTALLY
SENSITIVE
AREA

SANITARY PUMPING STATION, FIRE
PROTECTION & POTABLE WATER BOOSTER
STATION AND RESEVOIR **LONG-TERM**

NEW WATER (75mm), SANITARY (200mm), AND
FIRE PROTECTION (300mm) **LONG-TERM**

ENVIRONMENTALLY
SENSITIVE
AREA

FUTURE
AIRFIELD

AIRCRAFT
TIE-DOWN
AREA

PUMPING
STATION

SANITARY FORCEMAIN (100mm)
LONG-TERM

FUTURE PARALLEL TAXIWAY - CODE C

RUNWAY 09-27 (2134m X 30.5m) CODE 4C-NI

EDGE OF RUNWAY STRIP - CODE 4 - NI

CAVAM CREEK

RUNWAY 13-31 (564m X 30m)
CODE 2B-NI (TURF)

LIMIT OF GRADED AREA

504m

AIRPORT ROAD

NEW WATER (100mm), SANITARY
(200mm), AND FIRE PROTECTION
(300mm) **MEDIUM-TERM**

SANITARY FORCEMAIN (100mm)
MEDIUM-TERM



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City of Peterborough

Title

AIRPORT
SERVICING PLAN

Notes

- Ultimate/Long-term
- Medium-term
- Short-term
- Natural Gas
- Potable Water
- Forcemain
- Sanitary Sewer

*Electrical power, and
telecomm to be provided
according to similar layout.

Figure No.

7-3

Drawn By

AIM

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RAM

Date

September 2009

Scale

N.T.S

Filename

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8.1 Land Assignment

The intent of the Land Use Plan is to identify and maximize the use of airport lands. The Plan provides a rational and comprehensive framework for the development and use of airport lands, permitting the balanced fulfilment of future needs.

A Plan is based on a systematic land assignment for airport facilities, as well as a definition for each use, as described below:

Airfield – fixed and rotary wing manoeuvring areas, taxiways, aprons and navigational aids at the Airport.

Air Terminal and Operations – air terminal building, maintenance garage, security, fuel facilities, utilities, public facilities, terminal road system and public parking.

Airside Commercial – general aviation facilities and aviation support functions on land requiring airside access, including air cargo, aircraft maintenance, and helicopter facilities.

Groundside Commercial – public or private concerns not requiring direct airside access.

Airport Reserve – lands for which it is not practical to designate more specific uses at this time. The lands are held in reserve in order to meet unforeseen or possible contingency requirements within and beyond the planning horizon.

Environmental Protection Areas – lands designated in order to protect environmentally sensitive areas related to wetlands and the Cavan Creek/Otonabee River floodplain.

8.2 Recommended Plan

The recommended Land Use Plan for the Peterborough Municipal Airport is presented as Figure 8-1 on the following page.



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Client



City of Peterborough

Title

LAND USE PLAN

- Future Property
Boundary
- Alfild
 - Alport
Operations
 - Alside
Commercial
 - Groundside
Commercial
 - Floodplain
Reserve
 - Environmentally
Sensitive Area

Figure No.

8-1

Drawn By

HK

Approved By

RAM

Date

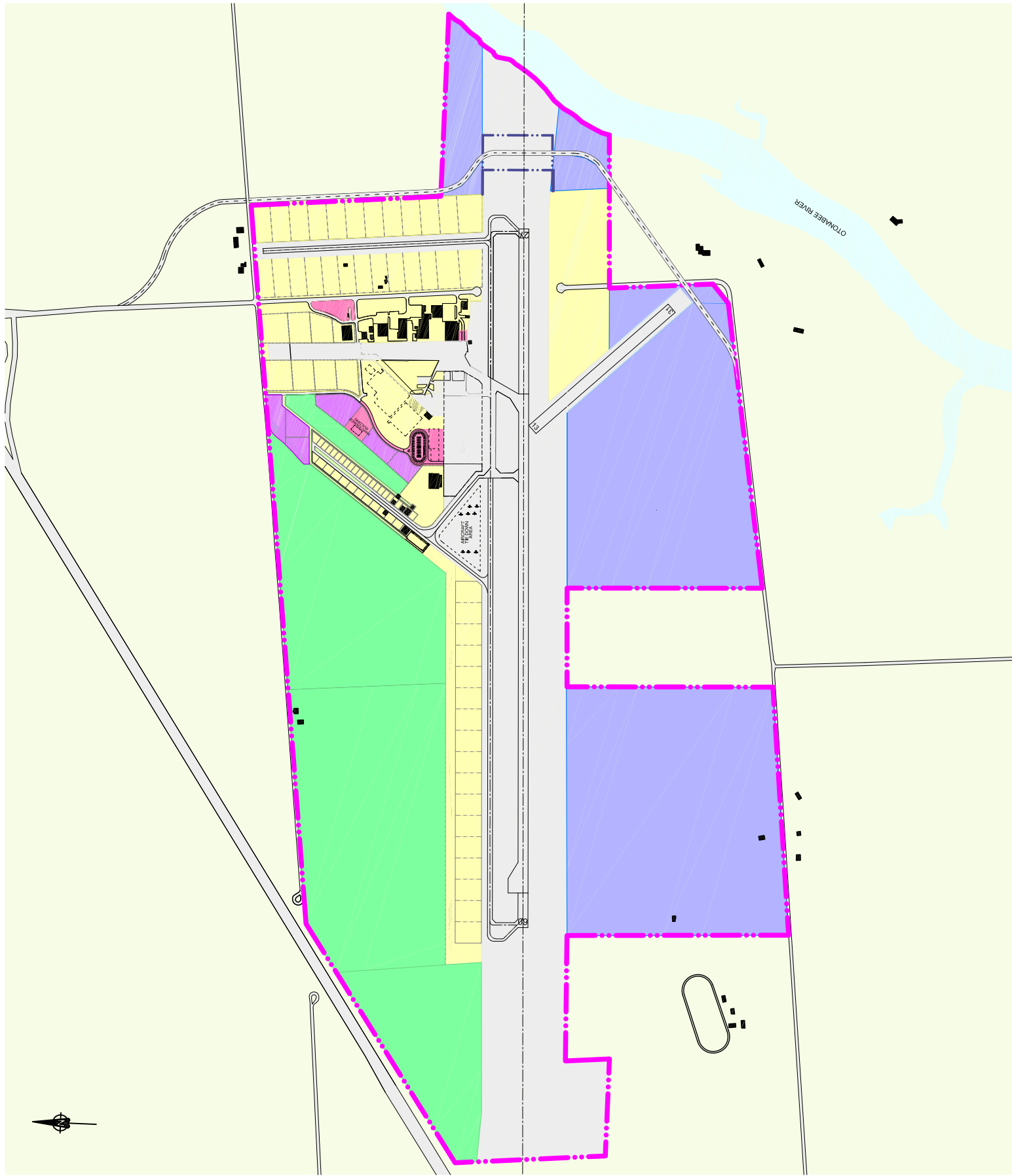
September 2009

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Filename

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9.1 Capital Cost Estimates

Cost estimates for each development phase are presented in Table 9-1 and costs for all the major development components of the Master Plan are presented in the following Table 9-2.

Cost estimates are based on information and assumptions known to the planning team during preparation of the Master Plan.

More accurate estimates will be possible once preliminary and detailed engineering designs are undertaken. Market conditions at the time of implementation may also affect the final costs.

**Table 9-1 – Capital Development Costs
Peterborough Municipal Airport**

Short Term	\$25,698,983
Medium Term	\$6,010,800
Long Term	\$10,773,360
Total	\$42,483,143

These investments include the \$9.5 million program already approved and underway at the Airport.

Table 9-2 – Capital Development Cost Estimates

	Short Term							Medium Term	Long Term
	2008	2009	2010	2011	2012	2013	2014	2015 - 2020	2021 - 2029
2008 Capital Expenses	\$2,271,044								
Future Capital Expenses									
Airport Business Case	\$61,905	\$10,435							
Airport Master Plan		\$80,200							
Soil Remediation and Subsurface Costs		\$382,000							
Engineering Design, Studies and Surveys		\$176,000							
Project Management		\$300,000							
Electrical and Natural Gas Servicing of West Ramp (Apron I)		\$190,000							
Contingency		\$564,000							
Apron I Extension		\$763,000							
Future Terminal Area Preparation (Apron II) Base		\$155,000							
Future Terminal Area Preparation (Apron II) Asphalt		\$164,000							
Future Terminal Area Parking (Asphalt)		\$127,000							
Future Terminal Area Parking (Base)		\$155,000							
Future Terminal Area Parking Expansion		\$127,260							
General Aviation Lot Preparation (Tie Downs & Expansion Area)		\$217,000							
Groundside Commercial Lot Preparation - Site 1		\$212,000							
Groundside Commercial Lot Preparation - Site 2		\$100,000							
Industrial Lot Preparation (Phase 2 - West)		\$127,000							
Industrial Lot Preparation (Phase 1 - West)		\$233,000							
Industrial Lot Preparation (West Side)		\$106,000							
New ATB/FBO Construction (Municipal Contribution)		\$530,000							
Service New Air Terminal Area		\$311,145							
Paving of Realigned Mel O'Brien Way (Phase 2)		\$127,000							
Permanent Drainage Improvements		\$212,000							
Prepare Aircraft Tie-Down Area		\$196,000							
Aircraft Tie-Down Area Expansion		\$34,000							
Private Hangar Acquisitions		\$285,244							
Ramp Extension Servicing to Mervyn Line		\$163,581							
Realignment of Mel O'Brien Way (Phase 1)		\$133,000							
Realignment of Mel O'Brien Way (Phase 2)		\$274,446							
Recreation Lot Preparation (Phase 2)		\$412,000							
Ramp Extension Servicing (West Side)		\$318,000							
Runway 09-27 Extension to 2,000'		\$2,658,000							
Partial Parallel Taxiway Construction (Taxi 'B' East)		\$1,245,000							
Aircraft Tie-Down Vehicle Parking Area			\$120,660						
Airport Road Relocation		\$2,096,640							
Commission Airport Governance Study			\$50,000						
Commission Airport Strategic Marketing Study			\$50,000						
EA, Design & Site Review, Project Management		\$1,579,400							
General Aviation Area Access Roads (Behind Lots)		\$272,600							
New Airside Fencing			\$125,000						
Apron II Expansion (additional 28,364 m2)		\$1,701,840							
Soil Remediation		\$3,000,000							
Runway, Taxiway and Apron Edge Lighting			\$146,000						
PAPI Acquisition			\$50,000						
Service Groundside Commercial Areas (Site 2)			\$145,000						
Strengthen Apron I			\$658,333						
Strengthen Runway			\$1,666,000						
Strengthen Taxiway 'A'			\$148,750						
Strengthen Taxiway 'B'			\$182,500						
Upgrade Field Electric Centre			\$285,000						
Apron I Extension - Tenant (Medium Term)								\$624,120	
Apron II Expansion (Medium Term)								\$465,180	
Construct Code C Taxiway (Site 3)								\$1,550,000	
Construct New Airfield Maintenance Building								\$675,000	
Prepare Industrial Lots (Site 3)								\$880,000	
Revisit Airport Forecasts								\$25,000	
Revisit Airport Strategic Marketing Study								\$25,000	
Service Industrial Lots (Site 3)								\$1,630,000	
Taxiway 'C' Pavement Extension								\$86,500	
Update Airport Master Plan								\$50,000	
Construct New Access Road (Site 4)									\$1,400,000
Extend Taxiway 'B' (West)									\$3,172,000
Prepare GA Commercial Lots (Site 4)									\$610,000
Service GA Commercial Lots (Site 4)									\$4,900,000
Update Airport Master Plan									\$50,000
Update Strategic Marketing Study									\$50,000
Airport Road Extension									\$591,360
	\$2,332,949	\$19,738,791	\$3,627,243	\$0	\$0	\$0	\$0	\$6,010,800	\$10,773,360

Appendix A – Forecasts of Real Growth of Ontario GDP

Forecasts of Real Growth of Ontario Gross Domestic Product

	Medium	Low	High
2009	-2.4%	-2.4%	-2.0%
2010	1.2%	1.0%	1.5%
2011	1.3%	1.0%	1.5%
2012	1.4%	1.0%	1.8%
2013	1.5%	1.0%	1.8%
2014	1.6%	1.0%	1.8%
2015	1.7%	1.0%	2.0%
2016	1.8%	1.5%	2.1%
2017	1.9%	1.5%	2.2%
2018	2.0%	1.5%	2.3%
2019	2.0%	1.5%	2.4%
2020	2.0%	1.5%	2.5%
2021	2.1%	1.6%	2.5%
2022	2.2%	1.7%	2.5%
2023	2.3%	1.8%	2.5%
2024	2.3%	1.9%	2.5%
2025	2.3%	2.0%	2.5%
2026	2.3%	2.0%	2.5%
2027	2.3%	2.0%	2.5%
2028	2.3%	2.0%	2.5%
2029	2.3%	2.0%	2.5%
2030	2.3%	2.0%	2.5%
2031	2.3%	2.0%	2.5%

Appendix B – Population Projections for Ontario Communities

Population Projections for Ontario Communities (Thousands)

	1996	2001	2006	2011	2016	2021	2026	2031
Greater Toronto Area (GTA)	4,769.30	5,301.30	5,882.00	6,388.90	6,911.70	7,404.30	7,859.30	8,266.00
Toronto	2,459.70	2,592.50	2,631.70	2,720.00	2,825.40	2,921.40	3,000.60	3,058.50
Durham	471.4	527	585.6	638	692.9	748.4	803.8	857
Halton	349.5	390.2	456.6	514.2	573.5	632	689.4	743.7
Peel	878.8	1,032.30	1,260.60	1,422.70	1,582.90	1,726.80	1,854.20	1,964.00
York	610	759.3	947.5	1,094.00	1,237.00	1,375.60	1,511.30	1,642.70
Central (Excluding GTA)	2,444.50	2,624.90	2,759.00	2,904.00	3,066.70	3,232.00	3,392.40	3,535.80
Brant	123.4	128.9	135.7	142.6	150.4	158.2	165.5	171.7
Dufferin	46.9	53	56.7	62.2	67.8	73	77.6	81.6
Haldimand-Norfolk	106.1	109.5	112	114.8	118.5	122.5	126.5	130
Haliburton	15.7	15.7	16.2	16.4	17	17.8	18.6	19.3
Hamilton	480.8	510.1	519.1	540.7	565.2	590.4	615.8	639.6
Muskoka	52	55.3	57.1	59.7	62.8	66.2	69.5	72.4
Niagara	414.5	426.5	435.1	442.2	452.7	465	477.9	489.5
Northumberland	76.4	80.5	84.2	88	92.5	97.1	101.5	105.2
Peterborough	126.7	130.7	133.9	138.4	143.7	149.3	154.8	159.6
Simcoe	338.9	391.8	434	478.8	525.8	571.6	614.4	651.2
Kawartha Lakes	69.7	71.8	75	76.9	79.8	83.3	86.9	90.1
Waterloo	417.1	456.3	491.6	522.9	556.3	589.5	621.7	651.5
Wellington	176.2	194.8	208.3	220.6	234.3	248.1	261.5	274
Eastern	1,529.50	1,608.50	1,660.80	1,719.70	1,804.80	1,893.00	1,980.00	2,059.80

	1996	2001	2006	2011	2016	2021	2026	2031
Ottawa	741.4	806.6	840.1	878.6	932.8	989.5	1,047.50	1,104.30
Frontenac	140.1	144.1	146.3	152.2	159.8	166.9	173.6	179.5
Hastings	130.8	132.2	136.6	140	145.4	151	156.2	160.3
Lanark	61.4	64.9	67.6	70.7	74.1	77.3	80.1	82.1
Leeds & Grenville	98.9	100.3	102.9	104.7	107.4	110.4	113.2	115.4
Lennox & Addington	40.3	41	42.3	43.5	45	46.7	48.4	49.7
Prescott & Russell	76	79.5	84.2	87.6	92	96.2	100	102.7
Prince Edward	25.7	25.8	26.5	27.2	28.2	29.3	30.5	31.5
Renfrew	99.2	98.8	99	99.1	101.7	104.5	107	109
Stormont, Dundas & Glengarry	115.7	115.3	115.3	116.1	118.4	121	123.5	125.3
Southwestern	1,484.20	1,541.40	1,579.40	1,626.50	1,684.20	1,744.40	1,804.00	1,857.70
Bruce	68	66.3	66.7	68.1	70.3	72.8	75.2	77
Elgin	81.4	84.7	88.8	92.1	96.1	100.1	103.8	107
Essex	360.3	390.5	405.3	423.1	442.1	461.7	481.3	500
Grey	89.9	92.5	94.7	97.5	101.5	106.1	110.7	114.9
Huron	61.8	62	61.4	62.2	63.6	65.2	66.9	68.4
Chatham-Kent	112.6	111.9	110	108.6	108.3	108.3	108.6	108.7
Lambton	133.3	131.8	132.3	132.2	133.1	134.4	135.9	137
Middlesex	402.9	422	436.2	453.7	473.8	493.7	512.8	530.1
Oxford	99.8	103.1	106.8	109.8	113.7	117.8	121.8	125.4
Perth	74.1	76.5	77.2	79.3	81.8	84.4	87	89.2
Northeastern	601.6	574.9	566	554.5	550.1	547.6	545.9	543.2

	1996	2001	2006	2011	2016	2021	2026	2031
Algoma	131.5	123.9	121.3	117.2	114.7	112.9	111.5	109.9
Cochrane	95.8	89.6	85.3	80.9	78	75.7	73.6	71.6
Manitoulin	12.9	13.2	13.3	13.5	13.7	13.9	14	14.1
Nipissing	87	86.3	85.8	86.1	87.2	88.4	89.5	90.4
Parry Sound	41.1	41.2	42.4	43.5	45.1	46.9	48.7	50.1
Greater Sudbury	169.8	161.2	161.9	160.5	160.1	159.8	159.5	158.9
Sudbury	24.7	23.8	22.2	20.9	20.2	19.7	19.4	19.1
Timiskaming	38.8	35.8	33.9	32.1	31	30.3	29.7	29.2
Northwestern	254	246.5	239.8	232.6	230.6	229.4	228.2	226.5
Kenora	67.3	66.5	65.7	64.6	65.4	66.2	66.7	66.8
Rainy River	24	23	21.9	20.9	20.3	19.9	19.6	19.3
Thunder Bay	162.8	157	152.2	147.1	144.9	143.3	142	140.4
Ontario	11,083.10	11,897.60	12,687.00	13,426.20	14,248.00	15,050.70	15,809.90	16,489.10

Appendix C - Historical General Aviation Activity – CYPQ

Historical General Aviation Activity – Peterborough Municipal Airport

	Itinerant					Local
	Carrier	Other Commercial	Private	Civil Government	Military	All
1996	599	519	2,232	117	9	15,473
1997	1,443	922	2,873	146	48	25,393
1998	1,459	923	3,062	168	35	15,074
1999	1,485	552	3,477	205	25	23,462
2000	988	535	2,124	173	12	15,676
2001	777	704	2,023	173	24	12,642
2002	522	726	2,646	83	26	19,028
2003	890	1,395	2,277	120	21	23,697
2004	726	1,105	2,286	97	22	14,809
2005	773	1,398	2,847	105	54	17,369
2006	1,054	1,613	2,935	143	84	8,598
2007	937	1,474	2,743	131	105	4,520
2008	947	1,919	2,649	233	140	9,397

Appendix D – Aircraft Movement Forecasts – CYPQ

Aircraft Movement Forecast - Peterborough Airport 2009-2031: Medium Case

	Carrier	Other	Private	Civil	Military	Local	Total
1996	599	519	2,232	117	9	15,473	18,949
1997	1,443	922	2,873	146	48	25,393	30,825
1998	1,459	923	3,062	168	35	15,074	20,721
1999	1,485	552	3,477	205	25	23,462	29,206
2000	988	535	2,124	173	12	15,676	19,508
2001	777	704	2,023	173	24	12,642	16,343
2002	522	726	2,646	83	26	19,028	23,031
2003	890	1,395	2,277	120	21	23,697	28,400
2004	726	1,105	2,286	97	22	14,809	19,045
2005	773	1,398	2,847	105	54	17,369	22,546
2006	1,054	1,613	2,935	143	84	8,598	14,427
2007	937	1,474	2,743	131	105	4,520	9,910
2008	947	1,919	2,649	233	140	9,397	15,285
2009	877	2,234	3,120	233	140	12,784	19,388
2010	894	2,265	3,175	237	141	13,019	19,730
2011	912	2,297	3,236	240	141	13,274	20,100
2012	932	2,334	3,304	245	142	13,563	20,519
2013	954	2,374	3,377	249	142	13,875	20,971
2014	978	2,416	3,456	254	143	14,210	21,457
2015	1,004	2,461	3,542	260	144	14,569	21,979
2016	1,031	2,508	3,635	266	145	14,955	22,539
2017	1,062	2,559	3,735	272	145	15,374	23,147
2018	1,094	2,613	3,843	279	146	15,823	23,798
2019	1,128	2,668	3,953	286	147	16,285	24,467
2020	1,162	2,725	4,068	293	148	16,761	25,156
2021	1,200	2,784	4,190	301	149	17,269	25,893
2022	1,240	2,847	4,321	309	150	17,810	26,676
2023	1,283	2,913	4,462	318	150	18,389	27,514
2024	1,327	2,981	4,607	327	151	18,986	28,379
2025	1,373	3,050	4,757	336	152	19,603	29,271
2026	1,421	3,120	4,912	346	153	20,239	30,192
2027	1,469	3,190	5,070	356	154	20,879	31,118
2028	1,519	3,261	5,232	366	155	21,539	32,073
2029	1,571	3,334	5,400	377	156	22,220	33,058
2030	1,625	3,409	5,573	388	156	22,922	34,073
2031	1,681	3,485	5,752	399	157	23,646	35,120
1996-2000	13.33%	0.76%	-1.23%	10.27%	7.46%	0.33%	0.73%
2000-2005	-4.79%	21.18%	6.03%	-9.50%	35.10%	2.07%	2.94%
2005-2010	2.94%	10.13%	2.21%	17.64%	21.08%	-5.60%	-2.63%
2010-2015	2.35%	1.67%	2.21%	1.89%	0.47%	2.28%	2.18%
2015-2020	2.98%	2.06%	2.80%	2.44%	0.55%	2.84%	2.74%
2020-2030	3.41%	2.26%	3.20%	2.84%	0.56%	3.18%	3.08%

Aircraft Movement Forecast - Peterborough Municipal Airport 2009-2031: Low Case

	Carrier	Other	Private	Civil	Military	Local	Total
1996	599	519	2,232	117	9	15,473	18,949
1997	1,443	922	2,873	146	48	25,393	30,825
1998	1,459	923	3,062	168	35	15,074	20,721
1999	1,485	552	3,477	205	25	23,462	29,206
2000	988	535	2,124	173	12	15,676	19,508
2001	777	704	2,023	173	24	12,642	16,343
2002	522	726	2,646	83	26	19,028	23,031
2003	890	1,395	2,277	120	21	23,697	28,400
2004	726	1,105	2,286	97	22	14,809	19,045
2005	773	1,398	2,847	105	54	17,369	22,546
2006	1,054	1,613	2,935	143	84	8,598	14,427
2007	937	1,474	2,743	131	105	4,520	9,910
2008	947	1,919	2,649	233	140	9,397	15,285
2009	877	2,234	3,120	233	140	12,784	19,388
2010	891	2,261	3,167	236	141	12,989	19,685
2011	906	2,289	3,215	239	141	13,198	19,987
2012	921	2,319	3,266	242	142	13,424	20,313
2013	936	2,349	3,318	245	142	13,654	20,645
2014	952	2,380	3,371	248	143	13,888	20,981
2015	968	2,411	3,424	251	143	14,125	21,324
2016	991	2,452	3,500	256	144	14,450	21,793
2017	1,014	2,494	3,579	261	145	14,787	22,281
2018	1,038	2,538	3,660	266	146	15,133	22,780
2019	1,063	2,582	3,742	271	146	15,486	23,290
2020	1,089	2,626	3,826	276	147	15,847	23,811
2021	1,116	2,674	3,917	282	148	16,236	24,372
2022	1,145	2,724	4,014	288	149	16,649	24,969
2023	1,177	2,776	4,119	294	149	17,093	25,609
2024	1,212	2,832	4,232	301	150	17,568	26,295
2025	1,249	2,892	4,354	309	151	18,077	27,030
2026	1,287	2,952	4,479	317	152	18,600	27,786
2027	1,326	3,011	4,605	325	153	19,123	28,542
2028	1,365	3,072	4,735	333	153	19,660	29,318
2029	1,406	3,133	4,869	341	154	20,213	30,116
2030	1,449	3,196	5,006	349	155	20,780	30,936
2031	1,492	3,260	5,148	358	156	21,364	31,778
1996-2000	13.33%	0.76%	-1.23%	10.27%	7.46%	0.33%	0.73%
2000-2005	-4.79%	21.18%	6.03%	-9.50%	35.10%	2.07%	2.94%
2005-2010	2.89%	10.10%	2.15%	17.58%	21.08%	-5.65%	-2.68%
2010-2015	1.66%	1.29%	1.57%	1.28%	0.41%	1.69%	1.61%
2015-2020	2.38%	1.72%	2.24%	1.90%	0.50%	2.33%	2.23%
2020-2030	2.90%	1.98%	2.73%	2.38%	0.52%	2.75%	2.65%

Aircraft Movement Forecast – Peterborough Municipal Airport 2009-2031: High Case

	Carrier	Other	Private	Civil	Military	Local	Total
1996	599	519	2,232	117	9	15,473	18,949
1997	1,443	922	2,873	146	48	25,393	30,825
1998	1,459	923	3,062	168	35	15,074	20,721
1999	1,485	552	3,477	205	25	23,462	29,206
2000	988	535	2,124	173	12	15,676	19,508
2001	777	704	2,023	173	24	12,642	16,343
2002	522	726	2,646	83	26	19,028	23,031
2003	890	1,395	2,277	120	21	23,697	28,400
2004	726	1,105	2,286	97	22	14,809	19,045
2005	773	1,398	2,847	105	54	17,369	22,546
2006	1,054	1,613	2,935	143	84	8,598	14,427
2007	937	1,474	2,743	131	105	4,520	9,910
2008	947	1,919	2,649	233	140	9,397	15,285
2009	906	2,289	3,215	239	141	12,784	19,573
2010	926	2,325	3,285	243	142	13,064	19,985
2011	948	2,362	3,356	248	142	13,350	20,406
2012	974	2,407	3,444	254	143	13,703	20,925
2013	1,001	2,454	3,533	259	144	14,735	22,126
2014	1,029	2,501	3,626	265	144	15,815	23,380
2015	1,060	2,553	3,729	272	145	16,978	24,738
2016	1,094	2,608	3,841	279	146	18,214	26,181
2017	1,130	2,667	3,962	287	147	19,498	27,691
2018	1,170	2,729	4,091	295	148	20,864	29,297
2019	1,212	2,795	4,230	304	149	22,286	30,976
2020	1,258	2,865	4,379	313	150	23,765	32,730
2021	1,305	2,936	4,534	323	150	25,320	34,568
2022	1,354	3,009	4,693	333	151	26,913	36,453
2023	1,404	3,083	4,858	344	152	28,588	38,430
2024	1,457	3,160	5,029	354	153	30,313	40,465
2025	1,511	3,238	5,205	365	154	32,089	42,563
2026	1,568	3,318	5,388	377	155	33,918	44,725
2027	1,626	3,397	5,575	389	156	35,741	46,883
2028	1,686	3,478	5,768	401	157	37,616	49,106
2029	1,748	3,561	5,968	413	158	39,547	51,395
2030	1,813	3,646	6,174	426	159	41,534	53,752
2031	1,880	3,733	6,388	439	159	43,580	56,179
1996-2000	13.33%	0.76%	-1.23%	10.27%	7.46%	0.33%	0.73%
2000-2005	-4.79%	21.18%	6.03%	-9.50%	35.10%	2.07%	2.94%
2005-2010	3.69%	10.71%	2.90%	18.32%	21.27%	-5.54%	-2.38%
2010-2015	2.73%	1.89%	2.57%	2.23%	0.50%	5.38%	4.36%
2015-2020	3.48%	2.34%	3.27%	2.88%	0.59%	6.96%	5.76%
2020-2030	3.72%	2.44%	3.49%	3.12%	0.59%	5.74%	5.09%

Appendix E – Transport Canada Correspondence



Transport
Canada

Transports
Canada

4900 Yonge Street
Fourth Floor
Toronto, ON M2N 6A5

UNCLASSIFIED

Your file *Votre référence*

Our file *Notre référence*

5151-1-243 PAD

October 9, 2009

Ms. Nancy Hewitt
Operations Coordinator
Peterborough Municipal Airport
RR #5
Peterborough, ON K9J 6X6

Dear Ms. Hewitt:

Re: Federal Jurisdiction for Aeronautics

This is in response to the questions raised during our meeting on Wednesday October 7, 2009 regarding jurisdiction over activities taking place at the Peterborough Municipal Airport.

Aeronautics falls exclusively under federal responsibility. As such, Transport Canada has sole jurisdiction over aerodromes, airports and any other related buildings or services deemed to be integral to aviation. This jurisdiction is based on the use of the lands in question and is not related to the property ownership or title. The Peterborough Municipal Airport operates as a certified airport under Part 3 of the Canadian Aviation Regulations (CARs). All lands associated with the airport that are being used for aeronautics are required to comply with the Aeronautics Act and CARs.

Transport Canada's role in aeronautics is to ensure aviation safety and security regulations and standards are complied with, and to ensure that no operation on aerodrome or airport property compromises those regulations and standards.

Transport Canada does not require aerodrome operators to rezone their lands or meet municipal zoning bylaws when building or expanding an aerodrome/airport. The location of aerodromes/airports is a matter integral to aeronautics and therefore falls under exclusive federal jurisdiction.

.../ 2

There are no federal regulations governing, for example, the construction of buildings on aerodrome/airport property. Therefore Transport Canada does not require that an owner of an aerodrome/airport obtain building permits or build to local standards when constructing facilities on their aerodromes/airports, provided those structures are considered integral parts of aviation.

While there are no federal regulations, this does not give provinces or municipalities the authority to invoke their own requirements. Neither level of government has authority over items such as building permits at aerodromes/airports. This matter was addressed in the case of **Orangeville Airport v. Town of Caledon, 1975**.

Although there is no legal requirement for aerodrome operators to obtain, as a continuing example, building permits, in many cases this is done voluntarily because of liability issues. In addition, municipal governments have the authority to determine the types of services that will be provided to landowners located within their jurisdictions. Transport Canada recommends that, wherever possible, aerodrome operators comply with all provincial and/or municipal building codes and bylaws.

Should you have any other questions please contact me at your convenience.

Sincerely yours,

Original signed by:

Greg Cross
Civil Aviation Safety Inspector
Aerodromes and Air Navigation
Ontario Region
Telephone: 905-405-3306
Facsimile: 416-952-0050



Transport
Canada

Transports
Canada

4900 Yonge Street
4th Floor
Toronto ON M2N 6A5

UNCLASSIFIED

Your file Votre référence

Our file Notre référence
5151-1-243 (PAD)

August 11, 2009

Mr. Malcolm Hunt
Director
Planning & Development Services Department
City of Peterborough
500 George Street North
Peterborough, ON K9H 3R9

Dear Mr. Hunt:

Re: Peterborough Airport – Runway Extension

Please accept this response to your letter dated July 10, 2009. The assumptions made in your letter are indeed correct. To maintain the integrity of your airport certificate you must maintain compliance with the Canadian Aviation Regulations and associated standards. Where there are recommendations in TP312 4th Edition, Aerodrome Standards and Recommended Practices, they are simply that based upon the potential for aircraft operations that would normally use a facility of that nature. Where you will not be following the recommendations of TP312 you may wish to publish restrictions or cautions as to the types, codes or dimensions of aircraft that can be accommodated at your facility. You will be required to comply with all regulations and standards as they pertain to the code appropriate to the length of the runway constructed.

Should you have any further questions please do not hesitate to contact me.

Yours truly,

ORIGINAL SIGNED BY:

GREG CROSS

Greg Cross
Civil Aviation Safety Inspector
Aerodromes and Air Navigation
Ontario Region
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