



Peterborough Airport Strategic Development Plan



November 2017 | 16M00197-01

Executive Summary

The Strategic Development Plan reviews business objectives, assesses activity growth and market demand, and recommends a preferable path forward for the City with respect to negotiating enabling agreements and land acquisitions, facilitating infrastructure investments, and pursuing enhanced operational capabilities for the airport. The Plan is considered to be an interim step between developing full Master Plan studies for Peterborough Airport and examines aviation industry trends and changes that may require a shift or re-focus in business and development tactics employed by the City of Peterborough. The Strategic Development Plan will assist Peterborough in achieving focused Aviation Industrial and General Aviation business growth at the airport. The Plan includes consideration of the potential role of the airport in serving the travelling public and in a supportive role in the Southern Ontario Airport Network. The future structure of the system is currently under discussion between GTAA and other airports, and the outcome will be subject to the results of an ongoing study by Transport Canada into the future of Pickering Airport.

Preparation of the Strategic Development Plan followed a comprehensive methodology. A workshop meeting with City and Airport officials took place to identify numerous issues and strategic needs. The Project Team re-validated the 2008 Business Case recommendations and current strategic objectives. Growth in the economic impact of Peterborough Airport was assessed in terms of employment, gross output, gross domestic product and other metrics with impacts classified as direct, indirect, and induced. The region's aerospace industry, both on and off-airport, contributed 1,088 full-time jobs to the regional economy. It accounted for \$103 million in gross domestic product and \$71 million in labour income.

The progressive build-out of projects over the last 8 years was assessed. Also assessed were the current competitive positioning of the airport, lessons learned over the last 8 years, and the ongoing priorities and focus on objectives.

Aviation activity projections were prepared for short term (1-5 years), medium term (6-10 years) and long term (11-20 years) time horizons and demand projections prepared for lots, facilities, infrastructure and services. Consultations were undertaken with airport tenants, and selected tour wholesalers and charter air carriers to confirm outlook, growth expectations, and new opportunities. A high level review of current airfield, terminal and groundside infrastructure was undertaken to assess the capability to meet all segments of projected business growth with deficiencies and requirements identified for each sector. A review of the commercial land and lot inventory identified land parcels, access and servicing deficiencies, and requirements needed to support commercial growth.



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The development strategy is based on providing adequately serviced lots to potential airport tenants, as demand occurs. Increasing Aviation Industrial and General Aviation activities seen over the past 7 years at Peterborough Airport indicate that investments will continue throughout the planning horizon and beyond.

The Airport Strategic Development Plan was updated to include compilation of the phased development requirements for airport, airfield, General Aviation and industrial sectors for the short, medium, and long terms. The Airport Land Use Plan was updated to reflect alterations in the development plan. A phased Commercial Real Estate Plan comprising land parcel and lot development plans was prepared for the short, medium, and long terms.

A strategic investment program was developed to identify annual projects for the short, medium, and long terms. In the short term, the Strategic Development Plan recommends extending Taxiway 'B' to the threshold of Runway 09, constructing a passing area on Apron III to facilitate aircraft circulation, preparation of General Aviation lots east of Apron III, preparation of a lot for T-Hangar Development in the South Development Area, construction of an access road and parking to serve small General Aviation lots east of Apron III, and the rehabilitation of Airport Road.

Water and sanitary sewer servicing connections to Peterborough Airport are currently at capacity and improvements are required to meet projected growth at the facility. When servicing was first provided to the Airport in 2002, there were 150 people employed at various airport businesses. In 2017, it was determined that approximately 570 people were on site at the airport – thus demonstrating the requirement for water and sanitary sewer capacity upgrades in the short term.

Medium and long term developments recommended include realigning Taxiway 'C', widening Taxiway 'F' to 10.5m (AGN II), establishing a grass Tie Down Area, extending Taxiway 'I', preparation of industrial and General Aviation lots in the West Development Area and South Development Area, servicing lots east of Taxiway 'I' and in the West Development Area, expansion of the public parking lot, and Relocation of the AWOS to facilitate expansion of the South Development Area.

The Strategic Development Plan includes a Phased Development Plan and a Recommended Land Use Plan.

Order-of-magnitude cost estimates were prepared by the Project Team for access roads, infrastructure and servicing cost (on airport property) aligned with strategic development program steps. Cost estimates are provided and call for Short Term investments of \$12.5 million, Medium Term investments of \$20.3 million, and Long Term investments of \$14.7 million.



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1.0 INTRODUCTION

Peterborough Airport has undergone a major transition over the last eight (8) years with a focus on Industrial, General Aviation and Flight Training development. The Strategic Plan reports on activity growth and development progress at Peterborough Airport since the Master Plan was published in 2009. Great advances have been achieved in financial investment, activity levels, employment levels, and the attraction of new businesses and tenants. The general public is benefitting directly from airport expansion through new charter flights, increased recreational flying, and commercial activities ranging from trade shows to dining. The Peterborough region is benefitting significantly from the indirect and induced economic activities associated with airport growth and operations.

The expanding complexity and chronology of airport growth is illustrated in Figure 1.1 – Approach to Strategic Development Planning. It illustrates how expansion has occurred in three streams:

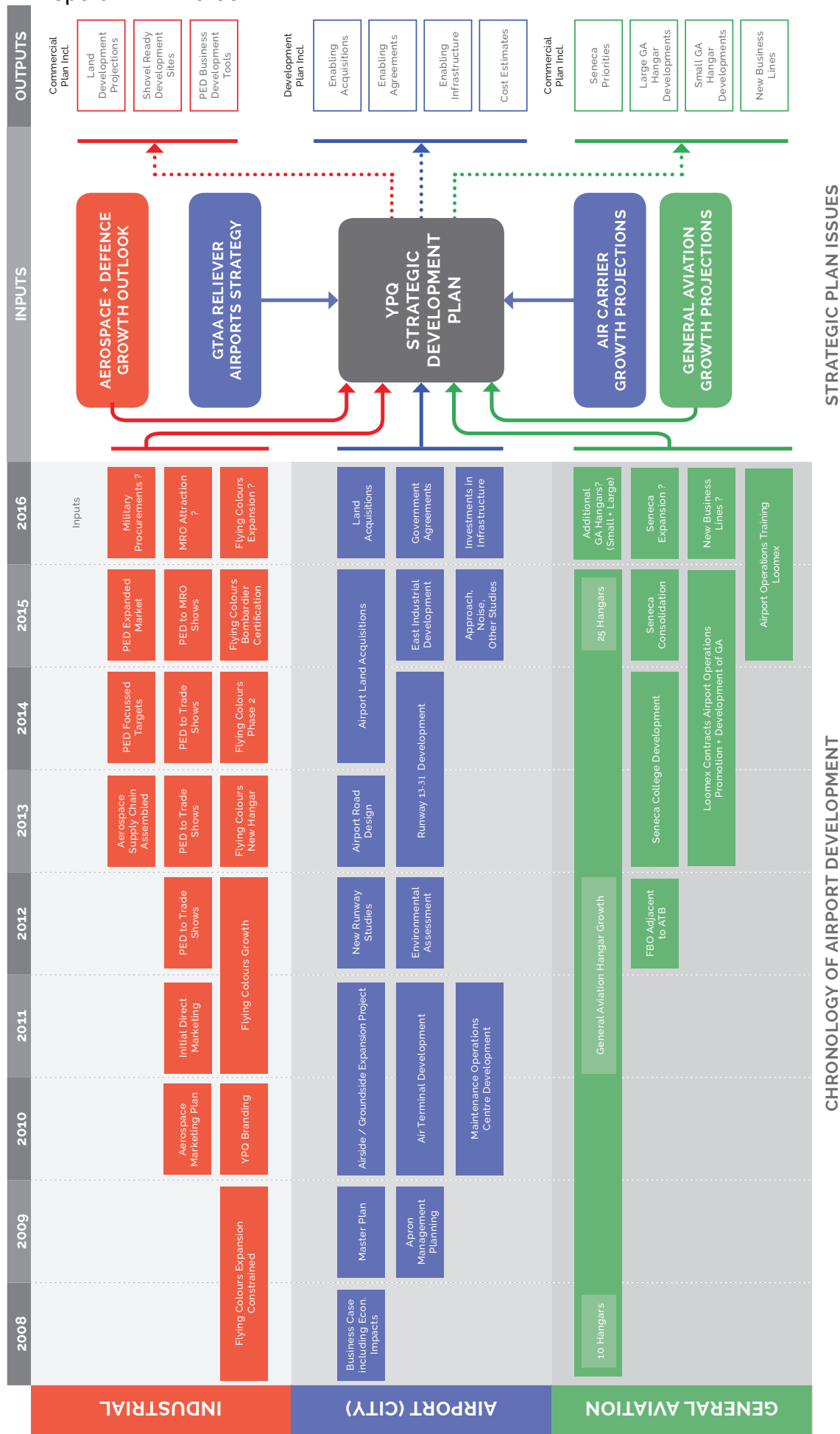
1. Development of enabling agreements, land acquisitions and infrastructure by the City of Peterborough.
2. Development of General Aviation investments and activities.
3. Development of Aviation Industrial investments and activities.

The recent growth of Peterborough Airport originated with a Business Case Study for Infrastructure Investments in 2008. Since then a host of planning studies, new development investments and new business activities have taken place, each with specific needs and requirements which were individually satisfied to facilitate expansion activity. Development has been based on the 2008 Business Case, the 2009 Airport Master Plan, the 2010 Airport Marketing Plan, and smaller focused studies targeting specific investors. Many new opportunities, often of greater scale than previously contemplated, now lie before the City, as the owner of the Airport. In addition, new demands are emerging for the potential use and expansion of the Airport. After 8 years there is a need to assess development to-date and determine the most appropriate priorities to continue the successful growth of the Airport.

Figure 1.1 illustrates at a high level most of the planning, development and operational improvement activities completed over the last 8 years. These were among the key inputs used in formulating the Strategic Development Plan for the next 10 years.

Additional inputs have included growth outlooks for the Aerospace and Defense sector, the General Aviation Sector, air passenger services, and opportunities arising from an emerging Southern Ontario Airports strategy spearheaded by the Greater Toronto Airport Authority. The Strategic Plan is considered to be an interim step between developing full Master Plan studies for Peterborough Airport and examines aviation industry trends and changes that may require a shift or re-focus in business and development tactics employed by the City of Peterborough.

Approach to Strategic Development – Peterborough Airport



2.0 STRATEGIC OBJECTIVES 2008

2.1 Business Case for Infrastructure Development

In the fall of 2008, the City of Peterborough commissioned LPS AVIA Consulting (now WSP) to prepare a business case for the development of infrastructure at the Peterborough Airport. At the time, the City was contemplating large capital expenditures to facilitate the growth of the anchor tenant as well as other airport businesses. The Business Case Study met a number of objectives including:

- ▶ Identification of the needs and opportunities of current airport tenants;
- ▶ measurement of the economic impact of the airport;
- ▶ estimation of the economic impact of improvements to the airport in relation to their costs;
- ▶ determination of specific facility improvements and associated costs for enabling the airport to accommodate narrow body (100-200 seat) aircraft;
- ▶ evaluation of the aerospace business segments that the airport might pursue, either with its current facilities or with reasonable and technically feasible improvements;
- ▶ estimation of economic benefits to the Peterborough community of these additional investments; and
- ▶ identification of key issues to be resolved for the airport to fulfill its commercial potential.

2.2 Growth Opportunities

Based on industry conditions at the time, the 2008 Business Case recommended that the City and airport management attract new tenants in the areas of:

- ▶ Facilities and services for a General Aviation airport such as parts suppliers, fixed base operators, flight schools, and aircraft dealers;
- ▶ a maintenance base for a scheduled airline;
- ▶ maintenance, repair and overhaul (MRO) operators involving Embraer E-Jets and narrow body B737 and A318/319/320 aircraft;
- ▶ an overhaul facility for the General Electric CF-34 family of jet engines popular for regional jets;
- ▶ aviation education, particularly jet/turboprop transition training, aircraft type ratings, and advanced aircraft maintenance;
- ▶ aerospace manufacturing, particularly in avionics and composite materials research and fabrication; and
- ▶ non-aerospace businesses that involve advanced technologies or processes and that require skills comparable to those needed by the aerospace industry.



2.3 Achievement of Objectives

Peterborough Airport, the City and Peterborough Economic Development (PED) have pursued all of the recommendations in the Business Case and achieved a great many successes. Overall, there has been an increase in the number of businesses located at the airport. Table 2.1 below provides a summary of the results.

Table 2.1 – Report Card on Airport Growth Objectives

Airport Growth Objective 2008	Status in 2017
Expanded facilities and services for General Aviation	<p>Achievements:</p> <ul style="list-style-type: none"> ▶ Large increase in General Aviation parking, hangar and storage ▶ Increase in existing Parts Supplier's national activities ▶ Expansion of manufacturer-approved maintenance services ▶ New hangars and General Aviation community developed ▶ GA services provided at new terminal ▶ New restaurant drawing a steadily increasing patronage ▶ Fuel truck improvements ▶ Airport management and training services company established ▶ Upgraded airfield maintenance services <p>Challenges:</p> <ul style="list-style-type: none"> ▶ Airport is not currently providing all services to support charter passengers, although workarounds have been implemented on an ad-hoc basis
Maintenance base for a scheduled airline	<p>Achievements:</p> <ul style="list-style-type: none"> ▶ Market has been actively pursued.

Airport Growth Objective 2008	Status in 2017
Overhaul facility for the General Electric CF-34 family of jet engines	Achievements: <ul style="list-style-type: none"> ▶ Market investigated, one turbine engine opportunity pursued. Challenges: <ul style="list-style-type: none"> ▶ Engine manufacturers (in large centres) have expanded their own services to increase share of after-market support.
Aviation education	Achievements: <ul style="list-style-type: none"> ▶ Seneca School of Aviation re-located from Buttonville Airport to Peterborough and expanded. ▶ The Loomex Group – Emergency Management Training Facility ▶ High School Specialist Skills Major in Aviation and Aerospace program.
Aerospace manufacturing	Achievements: <ul style="list-style-type: none"> ▶ Relationships now well-established with Boeing, Airbus, General Dynamics, IMP Aerospace and Bombardier (Flying Colours Corporation). Many technical visits to airport. ▶ Participation in major DND national procurement proposals.
Non-aerospace businesses that involve advanced technologies	Challenges <ul style="list-style-type: none"> ▶ Not actively pursued. The City has adopted an approach to be used only for aviation businesses.



3.0 ECONOMIC IMPACT

Peterborough Airport is a significant and growing contributor to the prosperity of the City and surrounding area. It provides rapid access to the region and supports a small but growing charter business for local residents. The Airport allows many aviation and support businesses to locate in the region.

The Airport must compete with many other community needs for City resources. The Peterborough community can make rational and informed decisions only if it understands the true benefits of the Airport. An economic impact analysis helps quantify the benefits of a facility such as an airport. It considers both the obvious on-site employment, and the more diffused benefits that propagate throughout the region, to many persons and businesses having no apparent relationship to aviation.

In 2008 LPS AVIA quantified the economic impact of the Airport. The findings served as part of the rationale for extending the main runway to 7,000 feet, among other improvements. These findings can now be updated in light of the successes enjoyed as the Airport continues to expand. New measures of the Airport's economic impact and contribution to the regional economy are provided below.

3.1 Economic Impact Assessments

Economic impact studies usually apply indirect methods to quantify the actions of each participant. A common procedure involves estimating a Keynesian-style model of income determination, with the multiplier depending on various “leakages” such as savings and expenditures outside the region. However, the most popular method involves a Leontief-style input-output model. These models track the flow of commodities between industries. Commodities may be used either as inputs to production, or for consumption as “final demands.”

The models directly lead to a set of matrices that state how increases in production in one sector result in increases in production in other sectors, and in final demands. These “multipliers” express indirect and induced expenditures as multiples of the direct activities.

The Statistics Canada input-output model is “open” in that final demands are exogenous. If total inputs increase, the model will not adjust final demands accordingly. The Statistics Canada model, therefore, does not provide multipliers for induced activities. The model assumes that salary deductions, health care premiums, unemployment insurance premiums, and federal and Ontario income taxes are spent within the Peterborough area. No distinction was made between the deductions and gross salaries. The analysis regards municipal taxes as fixed, with no indirect or induced components.



The multipliers of any economic impact study pose several empirical issues:

- ▶ they are derived from an econometric model, using data with inherent measurement problems;
- ▶ the coefficients of the model are not necessarily stable over time;
- ▶ the economic system does not necessarily exhibit constant returns to scale;
- ▶ expansion of any one particular activity might merely displace another; and
- ▶ the models assume that the economy is not at full employment, so that expansion of one activity can stimulate growth of other sectors.

These caveats apply to any static system. However, economic impact models are frequently (as in this instance) applied to extrapolate future events. An extrapolation amplifies any sources of error or non-linearities in the model. Despite these limitations, economic impact analysis offers a useful tool to assess infrastructure improvements.

3.2 Airport Economic Impact in 2016

3.2.1 Methodology

The methodology for determining the economic impact of a facility is well structured and widely accepted. The first step is to distribute a questionnaire (Appendix A) to all businesses and government agencies located on an airport. The completed questionnaires show the number of employees located on the airport. Sometimes, questionnaires may seek information on total wages and salaries, revenues, profits, and taxes. This extra information will result in greater precision. However, it significantly increases the effort businesses need to complete the form and many companies consider such questions intrusive. These objections may lead to a lower response rate. The 2016 study therefore sought information primarily on employee counts.

Statistics Canada's input-output tables show average relationships between the number of employees and the other variables for each industry in Ontario. "Economic Impact" can have many dimensions.

This study calculates the incremental Gross Domestic Product (GDP)¹, employment and labour income. Each impact occurs in three ways:

1. **Direct:** These impacts occur on the site of the facility being studied; in this case Peterborough Airport. The responses to the questionnaire provided the direct employment impacts. These effects are generated immediately through aviation activity. There are no intermediate steps between aviation activity and the calculated benefits.

¹ "Gross Domestic Product" represents the value of all goods and services produced within a geographical area. It deducts any goods or services used in the production of other goods and services. It is also called the "value added" of an economy. At the level of a firm, its counterpart is the corporate profit.

2. **Indirect:** Companies doing business on the airport make many expenditures in the region off-airport. The methods of economic impact analysis distinguish between benefits occurring within the footprint of the airport and those outside of it. The "Direct Effects" by definition occur on the airport site. The direct effects measure the collective importance of airport activities, as if the airport comprised a single business entity. These effects are estimated through a questionnaire. The "Indirect Effects" measure the importance of the tenants' expenditures on goods and services that occur outside of the airport. For example, an airport tenant may purchase goods or services from companies outside of the airport or a Fixed Base Operator might purchase catering services from a firm in downtown Peterborough. The catering firm will increase its employment and contribution to GDP accordingly. These impacts are "Indirect". Although attributable to the airport, they do not occur on the site of the airport.
3. **Induced:** The employees of on-airport firms and off-airport suppliers receive wages and salaries. They spend these funds in the community to purchase a wide range of other goods and services. These expenditures support further employment, GDP, and labour income. The process continues indefinitely, with each further round being smaller than the one immediately before it. This disparity results from "leakages" such as household savings and expenditures to areas outside of the community. The total impact of every successive round can be expressed as a multiple of the initial direct stimulus. The induced impacts are frequently referred to as "multiplier effects." The Statistics Canada input-output model provides multipliers for each province, using detailed information on business expenditures.

Although the methods for economic impact analysis are rigorous and widely accepted, every study requires a degree of discretion. Non-respondents to questionnaires are a common problem; therefore, employee counts of non-responding firms are estimated. The economic impact of Seneca College students was based on industry estimates of student local expenditures. The analysis requires a clear definition of the facility being examined. Some firms have no relationship to the core activity, such as a storage facility located on airport property. Some companies, although located off-airport, have a strong and immediate relationship to airport activity. A taxi company may have a downtown office, but some drivers may be primarily devoted to the airport business. Sometimes, Statistics Canada's models have no data for the industry in question. There are no established and formal mechanisms to overcome these problems; they require subjective judgements.

This analysis includes both Peterborough Airport and selected off-airport companies. It therefore measures the economic impacts of the Airport and the aerospace industry on the Peterborough economy.

Whether generated immediately by airport businesses as personal income, or through the more circuitous path involving purchases of goods and services, direct and indirect expenditures will constitute personal income.

Households receiving this income will spend it on goods and services. These expenditures will constitute personal income for other households, who in turn will increase their consumption. This process will continue repeatedly. The original wages, salaries and expenditures could be spent and re-spent many times. Each such spending round will stimulate new activity if the economy is not at full employment. The final result of many spending rounds will be a multiple of the initial expenditures. The relationship between the original stimulus and the cumulative effect of many rounds is called a “multiplier.”

3.2.2 Parties Included in Economic Impact Assessment

The parties included in the economic impact assessment calculations are as follows:

On Airport:

- | | |
|------------------------------------|-------------------------------------|
| ▶ Aerotrike Aviation | ▶ The Loomex Group |
| ▶ Airtech Canada Aviation Services | ▶ Peak Benefit Solutions |
| ▶ Amer and Associates | ▶ President Air Charter |
| ▶ Complete Aviation Services Ltd. | ▶ Seneca College Staff and Students |
| ▶ Dr. Cameron Boyd | ▶ Stewart Travel ² |
| ▶ Flying Colours Corporation | ▶ Toronto Avionics |
| ▶ Gardens and Fields Restaurant | ▶ Vector Air Limited |
| ▶ Kadex Aero Supply | ▶ W.M. Aeroflight/Aeroservice |

Off Airport:

- ▶ Safran Electronics
- ▶ City of Peterborough
- ▶ Stewart Travel²

The results of the consultation process are presented in Appendix B.

3.2.3 Analysis

Table 3.1 summarizes the results of the 2016 economic impact analysis of the Airport and off-airport aviation activity located within the City of Peterborough. There may be aerospace business activities occurring within the surrounding region, further contributing to GDP and employment growth figures presented herein. All monetary figures use 2008 constant

² Stewart Travel's economic impact was evaluated as both an on airport and off airport business. Extensive data was provided by Stewart travel into both the effort required off-site (organization, sales and logistics) for the planning of the tours, in addition to the effort required for providing the departure and arrival services at the airport itself (including security, customs and other expenditures). The level of effort provided was converted to a Full Time Equivalent, and expenditures within the Peterborough area were included in the GDP calculation.

Table 3.1 – Economic Impact of Peterborough Airport 2016

	On-Airport	Off-Airport	Total
Gross Domestic Product (\$Million)			
Direct	36.51	14.10	50.61
Indirect	19.35	7.85	27.19
Induced	18.18	7.20	25.38
Total	74.03	29.15	103.18
Labour Income (\$Million)			
Direct	33.29	11.81	45.10
Indirect	12.07	5.11	17.17
Induced	5.75	3.47	9.22
Total	51.11	20.39	71.49
Jobs (Full Time Equivalents)			
Direct	382	141	523
Indirect	246	80	325
Induced	171	68	239
Total	799	289	1,088

Note: The “Off-Airport” category includes aerospace/avionics manufacturers and travel-related businesses within the City of Peterborough. They are technically not part of the “airport” for purposes of calculating economic impact. However, they are, along with airport tenants, part of a growing aviation/aerospace industry in the community. The Labour Income category is a subset of Gross Domestic Product.

The two anchor tenants are responsible for a majority of the economic impacts. Flying Colours Corporation is a large international maintenance, repair, overhaul, completion, and refurbishment business with a client base extending across several continents; it benefitted significantly from the extension of the primary runway. In 2014, Seneca College moved its School of Aviation Technology to the Airport from Buttonville Airport. A second, shorter cross-wind runway was constructed to meet the training needs of the college. The longer primary runway allows tenants to undertake a greater variety of operations and permits the Airport to accommodate charter flights by Boeing 737-size aircraft.

³ The purchasing power of a dollar changes from year-to-year due to inflation. The purchasing power of the Canadian Dollar typically decreases by approximately 2% per year. In order to make accurate comparisons between monetary figures of the past, the values from current 2016 dollars were converted to reflect the purchasing power in 2008. This is known as 2008 constant dollars.



3.2.4 Findings

Peterborough Airport and its tenants directly employ 382 persons. The direct, indirect and induced employment level totals almost 800 full-time equivalent positions. The local aerospace industry, consisting of the Airport and off-airport aerospace companies, provides direct employment for 523 full-time equivalent persons, and total (direct, indirect and induced) employment for over 1,088 full-time equivalent positions. These airport/aerospace employees support an unknown number of dependents.

The region's aerospace industry both on and off-airport, contributed 1,088 full-time jobs to the regional economy. It accounted for \$103 million in gross domestic product and \$71 million in labour income. A summary of these findings is presented in Table 3.2.

Table 3.2 – Summary of Findings

Direct Employment at Peterborough Airport	382 FTE
Direct, Indirect and Induced Employment (On Airport)	799 FTE
Direct Local Aerospace Industry Employment (On and Off Airport)	523 FTE
Direct, Indirect and Induced Employment (On and Off Airport)	1,088 FTE
GDP	\$103,000,000
Labour Income	\$71,000,000

The 2016 analysis quantifies the large and growing contribution of the Airport in terms of widely accepted economic metrics; however, it does not assess the **quality** of the growth. Most positions in the airport/aerospace sector involve advanced technology. They require highly skilled and well trained employees. The students of Seneca College develop a familiarity with the community which may yield benefits in the future. The economic impacts calculated herein involve a wide range of aerospace activities. This diversification greatly decreases any inherent risks to the sector.

The City of Peterborough has, like most Canadian communities, experienced many challenges arising from market liberalization, international shifts in production activities, and plant consolidations. While considerable uncertainty surrounds the future of nearby automotive plants that employ local residents, Peterborough is becoming increasingly integrated with the Greater Toronto Area (and will be more so after Highway 407 is connected to Highway 115) which could lead to increased economic activity in a variety of areas.

The Airport and the local aerospace industry have demonstrated their ability to grow and to help the community grow with them.

3.3 Capital Investment Impacts 2008-2016

Over the last eight years, a large number of capital investments have been made and construction projects undertaken at Peterborough Airport. A summary of the more significant projects and the cumulative economic impacts of construction activity is provided in Table 3.3. The economic impact of these construction projects was calculated utilizing capital investment values provided by the City of Peterborough and applying appropriate provincial multipliers.

Table 3.3 – Employment Generated By Construction Projects at Peterborough Airport

Project(s)	Cost (\$Millions)	Total (\$Millions)	Employment (Person-Years ⁴)			
			Direct	Indirect	Induced	Total
Government						
2008 Multi Year Expansion	7.6	39.8	215	149	93	457
2010/2011 Major Expansion Project	21.0					
Temporary Air Terminal Building	0.375					
Runway 13-31 Development	6.0					
East Commercial Development	4.85					
Institutional						
New Seneca College Aviation School	13.0	13.2	71	49	31	151
High School Program Expansion/FBO	0.2					
Industry and Private						
Estimation of Private and Industry Construction. Includes Private hangar and Industrial facility expansion and construction.	16.6	16.6	90	62	39	191
Total		69.6	376	260	163	800

The largest component of airport investment originated from City of Peterborough initiatives

⁴ Person-Years is measure of employment effort. 1 Person-Year is equivalent to 1 Full-time Job for one year.



investing in major capital improvements for the Airport. The construction of these components including the 2008, 2010/2011 expansions, crosswind runway, and east commercial development saw an investment of just under \$40 million. These efforts facilitated 457 Person-Years of employment. Institutional construction projects included Seneca College's School of Aviation and the Holy Cross High School program saw an investment of \$13.2 million and resulted in 151 Person-Years of employment. Finally, Industry saw the second largest investment over the past 8 years, spending nearly \$17 million on capital projects requiring 191 Person-Years of employment. In total, \$69.6 million has been invested in capital projects at Peterborough Airport since 2008, creating 800 Person-Years of employment to the local economy.

3.4 Economic Growth Achievements – On Airport

Since 2008, the Airport has demonstrated its ability to expand. Its economic importance, significant in 2008, has increased dramatically. In 2008, short term improvements to the Airport were expected to generate at least 80 new direct full-time equivalent employee positions and \$11.6 million in GDP per year at the Airport. Total direct, indirect and induced employment was estimated to total 135 full-time equivalent positions, and the regional GDP was projected to increase by \$16.5 million per year. These benefits substantially exceeded the \$7.3 million capital cost.

The updated economic impact assessment has found that airport development has far outperformed the economic projections prepared in 2008. The Airport's economic impact has increased from 422 full-time equivalent positions in 2008 to 799 in 2016, representing a compound annual growth rate of approximately 8.3% per year. The contribution to the GDP grew from \$41 million to \$74 million, a compound annual growth of approximately 7.6% per year. GDP grew by \$33 million and is expected to grow as time goes on. The economic benefits to the region due to the expansion far outweigh the initial capital investment. The Airport has also significantly exceeded all of the economic performance projections set out in the 2008 Business Case. The growth in economic impact is presented in Table 3.4.

Table 3.4 – Growth in Economic Impact of Peterborough Airport

	2008 Actual	Growth Projection* (2016)	2016 Actual	8-Year Increase	Compound Annual Growth	Compound Projected Annual Growth
Gross Domestic Product (\$Millions)						
Total	41.3	57.7	74.03	+79%	+7.6%/year	+4.3%/year
Employment (Full time equivalent)						
Total	422	557	799	+89%	+8.3%/year	+3.5%/year

* Based on expansion set out in 2008 Business Case

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Note: Both Gross Domestic Product and Employment figures shown in Table 4.3 represent the aggregate value of Direct, Indirect and Induced economic performance metrics.

The GDP growth at Peterborough Airport well exceeded the organic growth of the Canadian economy as a whole. During the same 8-year period Canadian GDP grew on average 1.4% per year, substantially lower than the growth observed at Peterborough Airport. The growth of GDP observed at Peterborough Airport has expanded at elevated rates as a result of temporary employment gains to support construction projects at the facility. The growth observed was substantially in excess of nationwide GDP growth. GDP is continually growing in Peterborough due to increasing population and productivity⁵. High land and real estate prices in Toronto could potentially shift further economic activity to satellite communities like Peterborough (especially after the extension of Highway 407 to Highway 115). This, along with the investments, has contributed to Peterborough Airport's exceptional economic performance.

⁵ It should be noted that economic impact is dynamic and constantly changing. The economic impact values presented in this report are a snap shot of the estimated economic environment in late 2016.

4.0 AIRPORT ROLE UPDATE

4.1 Strategic Positioning 2008

Based on the Business Case for Expansion in 2008, the City of Peterborough positioned the Airport predominantly to serve the **Aviation Industrial** and higher-end **General Aviation** sectors of the air transportation market. These sectors were, and still are, most likely to produce the greatest levels of employment growth and economic benefit to the City and region. The two anchor tenants are now among the top Canadian organizations in each of these aviation sectors.

The City and various stakeholders have indicated interest in expanding the Airport to serve other sectors such as the leisure passenger air charter market and high-end corporate General Aviation market. The Airport will continue its role as a leader in the Aviation Industrial and General Aviation sectors, but remains open for business and is willing to consider any new opportunities that may arise in the future.

Over the last 8 years there have been many changes in the air transportation industry in general, and in the airport and aviation businesses in Ontario. Some of these changes present new opportunities for growth worthy of consideration by the City of Peterborough, as described below.

4.2 Southern Ontario Airport Network - Growth

The Greater Toronto Area (GTA), including the City of Toronto and the municipalities of Durham, Halton, Peel and York, had a population which surpassed 6 million people in 2011. Toronto Pearson International Airport serves this market and also draws passengers from a larger catchment area encompassing Hamilton, Niagara, Kitchener-Waterloo, Trenton, Belleville and the Peterborough region. The Government of Ontario expects the GTA to undergo significant growth absorbing approximately 50% of the entire provincial population by 2025.

This intense growth in population will continue to drive demand for aviation in the region. The Greater Toronto Airports Authority (GTAA) operates Toronto Pearson International Airport and envisions itself becoming a “Mega-Hub” airport. The GTA is home to an ethnically diverse population, with extensive international connections among its residents. These individuals have distinct interests in overseas destinations, driving growth in international passenger travel. International flights are forecast to grow to make up the majority of activity at Toronto Pearson Airport. By 2035, Toronto Pearson Airport has the potential to accommodate 80+ million passengers.⁶ Passenger air travel demand could reach as high as 110 million passengers per annum by 2043.⁷

⁶ Toronto Pearson Airport: Growing Canada with a Mega Hub Airport, GTAA, 2016.

⁷ Flying Together: The Southern Ontario Airport Network, Southern Ontario Airport Network, May 2017.

As Toronto Pearson Airport approaches capacity, GTAA may invoke several measures to increase its functional capacity. Relocation or reduction of certain services that restrict capacity may present opportunities for Peterborough Airport. In addition, the high cost environment at Toronto Pearson may serve as a deterrent for certain tenants to remain at that airport.

GTAA recently established the Southern Ontario Airports Network (SOAN) to bring together a group of airports with the capability to meet the overall capacity demands of both the market and the population of the GTA. The SOAN consists of 11 international, regional and municipal airports in southern Ontario. Figure 4.1 illustrates the participating airports in southern Ontario, which form the SOAN. These airports include:

- | | |
|---|--|
| 1. Toronto Pearson International Airport | 6. London International Airport |
| 2. Billy Bishop Toronto City Airport | 7. Oshawa Executive Airport |
| 3. Hamilton John C. Munro International Airport | 8. Niagara District Airport |
| 4. Kingston/Norman Rogers Airport | 9. Peterborough Airport |
| 5. Lake Simcoe Regional Airport | 10. Region of Waterloo International Airport |
| | 11. Windsor International Airport |

Figure 4.1 – Southern Ontario Airport Network (SOAN)



Source: Flying Together: The Southern Ontario Airport Network, Southern Ontario Airport Network, May 2017.

According to GTAA and participating SOAN members, each airport in the SOAN will continue to operate as independent entities, making their own strategic decisions and serving their own respective community needs. The primary objective of the SOAN is to provide an open forum for airports, businesses, and air operators to discuss opportunities of air service development in the region and to ensure southern Ontario has the capacity to support all types of aviation demand.

Peterborough Airport has been actively engaged in the development and discussion surrounding the creation of the Southern Ontario Airport Network and has ample capacity and developable land to respond to any need, opportunity, or recommendation that may arise from the proceedings of the SOAN forum.

4.3 Southern Ontario System - Opportunities

Peterborough Airport has the longest civil runway east of the GTA. Its infrastructure is capable of accommodating the most demanding large corporate aircraft, and is capable of serving Boeing 737 and Airbus A320 series (narrow-body) or smaller aircraft. Other than Peterborough Airport, Oshawa Airport is the only alternative airport serving the eastern communities of the GTA once Buttonville Airport closes. Oshawa Airport is well situated to serve the eastern GTA, but lacks the infrastructure to handle more demanding aircraft types such as large corporate aircraft. With a maximum runway length of 4,250 ft. it is unable to accommodate large aircraft and lacks any sizable developable land parcels for aviation industrial use such as large MRO operations and significant corporate General Aviation traffic. There is considerable local resistance to runway expansion at Oshawa Airport.

Peterborough Airport is competitively located with respect to Oshawa and enjoys a strong local commitment to its development. It has excellent access to the provincial highway network, in particular to Highway 115, and in 2020 to Highway 407. Reduced travel times from the GTA to Peterborough Airport further increase its ability to serve as a choice for operators in the GTA. Particular attractions for aviation industrial and flight training users is Peterborough's lower cost of living, high quality of life and a highly skilled work force. Businesses located at airports closer to the GTA suffer from higher living and housing costs, increasing labour costs, and greater competition for workers.

The Province of Ontario has included Peterborough and surrounding municipalities in its *Growth Plan for the Greater Golden Horseshoe (GGH)*⁸. Located in the "Outer Ring" of the GGH, the City and County of Peterborough will have several targets when it comes to its growth. For example, Downtown Peterborough has been included in the planning for urban growth centres. Urban growth centres are centres for investment in regional public service facilities, in addition to accommodating commercial, recreational, and cultural entities.

⁸ Places to Grow: Better Choices. Brighter Future. Growth Plan for the Greater Golden Horseshoe, Province of Ontario, 2017.

The urban growth centre must also be planned to have a transit network providing both regional and intra-regional transportation to support significant population and employment growth in the region. Downtown Peterborough has a target density of 150 residents and jobs combined per hectare.

Lake Simcoe Regional Airport has positioned itself as a reliever airport for corporate General Aviation activity within the network of airports. Recent investment by private entities has resulted in increased corporate activity at the G&G Jet Center. The G&G Jet Centre is a full service FBO which provides a luxury experience for corporate aircraft owners. The company utilizes helicopter transport to ferry passengers who arrive at Lake Simcoe Regional Airport to downtown Toronto. This helicopter trip takes approximately 20 minutes, regardless of time of day. This transit time is often quicker than ground transport between Toronto Pearson and downtown Toronto. Peterborough Airport possesses both the runway length and developable land to attract an executive type aviation operation, similar to services currently being provided at Lake Simcoe Regional Airport.

The City of Peterborough's aggressive investment strategy and focus on industrial and airport business development has established its niche within the system. Development of a new airport on federally owned lands at Pickering is surrounded by uncertainty. Development of a Greenfield airport is a rigorous and protracted undertaking requiring planning, design, environmental assessments, public consultations and numerous approvals. Should Transport Canada decide to proceed, or allow others to proceed with development of a new Pickering Airport, it could take as long as 10 years to become operational. The action of GTAA in developing the Southern Ontario Airports Network suggests that the appearance of an airport on the Pickering Lands within the next 20 years is unlikely. The type and role of any future airport at Pickering is currently unknown. It is expected that Transport Canada will publish studies outlining future recommendations for the development of a new Pickering Airport in late 2018.

However, there are a number of potential growth opportunities that may arise for Peterborough Airport if GTAA is successful in off-loading various aviation activities and operations to surrounding airports in the region. Four potential areas of opportunity are described in the following sections.

4.3.1 Increased Corporate General Aviation Activity

Toronto Pearson Airport's overall capacity is limited by its runway capacity and need for a runway slot allocation system. Corporate aviation utilizes landing slots at the airport lowering the airport's overall capacity for higher density passenger flights. It is expected that General Aviation operations at Toronto Pearson Airport will continue to decline and migrate to other airports within the region. Many General Aviation businesses currently operate within the GTA at Buttonville Airport and Oshawa Airport. However, larger corporate aircraft require longer runways and will migrate to airports such as Waterloo, Hamilton, Lake Simcoe and Peterborough.

Peterborough Airport has the runway length and availability of developable land to serve large corporate aviation demand for the eastern GTA; however, it currently lacks a large-scale Fixed Base Operator (FBO) facility that provides short term hangar rentals for itinerant General Aviation aircraft. It is recommended that Peterborough Airport continue to seek interest from commercial developers to provide a large-scale FBO at the airport.

4.3.2 Growth of Flight Training

Major airlines in North America are currently facing increasing shortages of trained pilots. Demand for professional pilots is expected to rise. On average, flight training costs for a pilot destined to commercial aviation can range from \$60,000 to \$90,000⁹, which will typically lead to unimpressive pay prospects for starting positions. Domestic enrollment in professional flight training has been decreasing, with 81% of commercial pilots' licenses being issued to Canadians in the 1990's to only 55% in 2016⁷. Foreign students typically do not stay in Canada to work. If license issuance remains at current levels there could be a shortfall of nearly 6,000 pilots by 2036⁹.

Peterborough Airport is extremely well positioned to accommodate this demand for professional pilots with Seneca College. As mentioned above, the cost of flight training is continually increasing due to rising costs of fuel, insurance and aircraft maintenance. Flight training organizations at the airports within the GTA face airspace capacity issues, long flight times to practice areas, and ground delays further impacting the costs associated with flight training. Peterborough Airport is located outside of the Toronto Control Area thereby offering substantially reduced flight time costs with training undertaken in relatively close proximity to the airport.

In addition, many professional pilot hopefuls are enrolling in structured flight training programs like that of Seneca College. These programs are often conducted in association with Canadian air carriers to ensure pilots are trained to industry and company standards. Relationships between air carriers and educational institutions such as Seneca College is expected to become more common place as airlines search for flight crews. It is expected that Seneca College's flight operations will continue growth throughout the planning horizons. Peterborough Airport has the capacity and space to accommodate extensive growth at Seneca College, and is the ideal place for advanced flight training possibly accommodating full size, full motion flight training devices, turboprop and turbofan power plant training. The Airport also has sufficient airside capacity and is an attractive location to accommodate additional flight training operations. The addition of Air Traffic Services (ATS) at the airport may be required should activities of this nature expand considerably.

⁹ Canadian Pilot Shortage "very real," says industry consultant, Skies Magazine, 2017.

4.3.3 Potential Maintenance Repair Overhaul Opportunities

Peterborough Airport's capability and reputation as an industrial airport, with an established aerospace supply chain and other benefits, make it a potentially attractive location for a Regional Jet/Narrow Body Jet MRO facility in the eastern GTA and eastern Canada. The airport already has shovel-ready land available that is sized for these types of operations. Section 5.3 provides a detailed view into the market outlook and potential MRO opportunities that may arise from the Southern Ontario Airport Network.

4.3.4 Leisure Destination Charters

As congestion in the GTA increases, passenger travel times to Toronto Pearson International Airport from Peterborough and other eastern GTA communities are likely to increase. Toronto Pearson Airport offers a large selection of potential destinations, airlines and schedule frequencies to passengers. Peterborough will never be able to match these choices and airfare levels. However, Peterborough has recently proven to be able to support periodic leisure charter flights by B737 aircraft to recreational destinations. This is possible due to the organizational abilities and marketing capabilities of tour operators who are able to pre-sell sufficient tickets to a single destination to support one or a series of charter flights from a specific market area. These flights are operated by airlines having surplus aircraft, or airlines with gaps in their schedules when an aircraft may be positioned to Peterborough and operate a return charter flight. Demand for this type of service is strong at Peterborough Airport and further expansion of regular seasonal sun destination charters is limited by the lack of a dedicated facility to house customs inspection, passenger security, baggage processing, etc. This role is complimentary to the airfield infrastructure that has been constructed to date. In addition, the requirement for lower approach minima becomes further emphasized to support reliable air charter operations.

Consultations with the charter operator indicate a desire for overnight hangarage for B737-type aircraft to reduce morning delays due to aircraft de-icing requirements. Further expansion of the leisure charter market could be limited because of the current displaced threshold of Runway 27. Current and future air service providers will be able to operate with fewer restrictions once the displaced threshold is removed and 7,000' of operational runway is provided in both directions. Eliminating the displacement will be an important step in increasing the future air service potential at Peterborough Airport.

4.4 Updated Role 2018

It is recommended that Peterborough Airport's role continue to focus on Industrial Aviation and General Aviation (including flight training) through the 20-year planning horizon as this role is a proven economic driver for the region. In addition, an airport is considered as a valuable transportation asset when businesses are seeking a new city to establish operations.



The roles identified above match the City of Peterborough's investment decisions made over the past decade.

Compared to other airports in the network, Peterborough Airport is extremely well positioned. Peterborough Airport is certified and well supported by the community and local government. Extensive investment has been made in the past 8 years to provide ample land ready for immediate development when opportunities arise. An extensive, growing industrial employment base at the Airport drives activity in manufacturing and supports local business in the supply chain. This economic impact greatly justifies further investment in Peterborough Airport. Ground transportation connections to the Airport provide excellent regional accessibility and a talented workforce and low cost of living attract prospective business to set up in Peterborough. Peterborough Airport is currently examining options to improve its overall airport availability, more specifically by studying the implications of certifying Runway 09-27 to TP312 5th Edition (Non Precision) standards in an attempt to lower approach minima to better support current air operators and attract new operators. In addition, Peterborough Airport is a Transport Canada-certified facility, with all infrastructure and operating practices meeting the requirements of the Canadian Aviation Regulations (CARs) and is permitted to support scheduled air services. Certified airport status also provides assurances to airport users that the facility is operated in a safe manner under the provisions of a Safety Management System (SMS).

Peterborough Airport is well prepared to embrace potential opportunities arising from strategies of GTAA's Southern Ontario Airport Network. Peterborough Airport's role is to respond to opportunities in:

- ▶ General Aviation;
- ▶ Maintenance Repair and Overhaul;
- ▶ Aerospace Manufacturing
- ▶ Leisure and Executive Charter Markets; and
- ▶ Research & Development.

The new opportunities are complimentary to the roles listed in the 2009 Business Case using the current airside infrastructure built to accommodate industrial businesses. These opportunities have been taken into consideration in activity forecasts and projections presented in subsequent sections of this report.



5.0 GROWTH OUTLOOK AND PROJECTIONS

5.1 Introduction

Projections and forecasts for most airports must address complex economic and regional concerns. The major issues facing Peterborough include the eastward spread of the Toronto metropolis, the prospective development of Pickering Airport, the degree to which the airport will serve populations outside the immediate vicinity of Peterborough, and the development of the regional industrial base.

5.2 Assumptions

The Strategic Development Plan is based on a series of assumptions, as noted below.

- ▶ Peterborough's Growth has accelerated. Peterborough is identified in the provincial Greater Golden Horseshoe growth plan as a major urban center. The communities of Peterborough and the Kawarthas have begun to exceed historical rates of growth. The broader growth of the GTA has pushed development to its outer extents. The Highway 407 east expansion is currently being constructed past Oshawa and its connection to Highway 115 is slated to be complete in 2020. Drive times to Toronto Pearson Airport and points east in the GTA have already seen significant reductions at peak hours over the previous Highway 407 routing. Improved GO bus service to Oshawa trains has led to an increase in commuting to the GTA.
- ▶ The Ontario economy will continue to depend on trade with the United States and the basic components of the North American Free Trade Agreement (NAFTA), even if modifications occur. The Canada - US dollar exchange rate will be a critical factor in Ontario's competitiveness. The price of oil will not rise sufficiently during the 20-year forecast period to cause a detrimental appreciation of the Canadian currency.
- ▶ Business at Peterborough Airport could be mildly affected by the state of global economic conditions. Anchor tenant, Flying Colours Corporation, serves clients throughout the world. The demand for their services could depend on conditions in North America, Europe and Asia. Operations could also be affected by any changes in the value of the Canadian dollar. Flight training demand is expected to remain resilient due to the factors presented in Section 4.3.2.
- ▶ A new airport with an as yet undefined role may come on stream at Pickering in the mid-2030's at the earliest. It will not likely compete with Peterborough for General Aviation or local leisure charter traffic. Any high volume charter flights at Peterborough Airport would serve the catchment area bound by Pickering in the west, Napanee in the east, and Haliburton to the north. This catchment area consists of approximately 2 million people.
- ▶ The City of Peterborough is home to many educational institutions. Trent University, located north of the city centre is a well-known liberal arts and science oriented university with a strong focus on studies related to the environment and biology.

Seneca College provides professional pilot training services, including ab initio and commercial training through its Bachelor of Aviation Technology curriculum. The College has a number of single and multi-engine aircraft, as well as desktop and sophisticated Regional Jet training devices. Sir Sanford Fleming College, is a trade school located in close proximity to the airport and offers vocational training for many specialized skills and trades. Finally, Holy Cross High School offers an Aviation and Aerospace Specialist High Skills Major program to prepare students for further education and careers in aviation. In the past, the airport and its business have assisted in developing programs at these educational institutions to train students for in demand trades required by employers at the airport. For example, Fleming College formerly offered a program for aircraft interior finishing in conjunction with Flying Colours Corporation. While the possibility of further educational connections between the airport and area schools is strong, their implementation is not expected to result in significant activity increases at the airport.

- ▶ The new Trent Innovation Park, currently being constructed near Trent University, is a business park for start-ups and established businesses alike to innovate and develop new clean technologies with the intention of bettering the earth's environment. Its close proximity to Trent University aims to provide businesses with enhanced access to the universities' research and development capabilities, as well as the highly educated workforce that it produces. It is not expected to have any direct business implications with Peterborough Airport, however the airport, as a critical piece of transportation infrastructure will continue to support the educational institutions and vice versa. The airport and the Trent Innovation Park should continue to communicate about different ways to cooperate and fill their respective workforce needs.

5.3 Aerospace and Defence Activity and Outlook

The airport's Industrial Aviation activity and growth arises from global, North American and Canadian activities in the aerospace and defence sectors of the air transportation market. The market has, in general, steadily expanded.

While new global aircraft production was valued at some USD 180 Billion in 2015, the Maintenance Repair and Overhaul (MRO) market was valued at about USD 135 Billion annually (ICF Int'l). Companies at Peterborough Airport participate in both sectors.

5.3.1 Aircraft Production

The International Air Transport Association (IATA) released its annual passenger forecast in October 2016 calling for world passenger demand to double over the next 20 years increasing from 3.8 billion passengers in 2016 to 7.2 billion passengers in 2035. This represents a 3.7% annual compound average global growth rate, and a 2.8% annual growth rate in North American traffic.

ICF International / CAPA 2015 (Apr. 2016) have identified that the world air transport fleet stood at 27,100 aircraft in 2015 and that to accommodate growth some 19,600 new aircraft will be delivered by 2025. During this decade some 8,800 older aircraft are also expected to be retired.

Flying Colours Corporation provides new aircraft completion services (typically involving external paint and interior fit-up) to Bombardier Aerospace and potentially other Original Equipment Manufacturers (OEMs). Most activity is focused in business and General Aviation which represents about 14% of the Aircraft Production sub-sector (ICF Int'l). Participation in the Air Transport subsector (61%) and Military sub-sector (12%) is potentially available to industries at Peterborough Airport. New aircraft completion contracts acquired by Flying Colours Corporation are one of the primary engines of growth in employment at Peterborough Airport.

Regional Aircraft: The global outlook for commercial aircraft production is very encouraging. In 2015 some 31% of the global fleet was based in North America with 28% being regional size jet or turboprop aircraft, within the support capabilities of existing businesses at Peterborough. However, this market is changing due to operating economics with older, smaller regional aircraft now being replaced by larger capacity aircraft with lower fuel costs and superior performance.

Bombardier forecasts demand for 60-100 seat regional aircraft will amount to some 5,700 new aircraft over the next 20 years. Bombardier's 76 seat Dash 8-400 has replaced earlier Dash 8-100/300 models which are now out of production. However, Dash 8-400 sales are slowing as other advanced versions of competitive aircraft such as the ATR72-600 are proving more attractive in certain airline markets around the world. Bombardier's other products in this size category include the Regional Jet CRJ 700/900/1000 series which continue to sell well. Larger cabin business jets based on Bombardier's Regional Jet series offer opportunities for Peterborough Airport as described later.

Narrow-body Aircraft: In the conventional narrow-body category both Airbus and Boeing had contemplated development of entirely new aircraft to replace their respective A320 and B737 series aircraft. This would have led to the retirement of a very large number of older aircraft and potentially spawned an aircraft recycling industry sub-segment. This market was investigated at the time for Peterborough Airport by LPS/MMM and initial discussions held with Airbus who were considering a possible North American facility, based on a test facility then in-operation in southern France. However, first Airbus and then Boeing (in 2011) opted instead to re-engineer their existing A320 and B737 product lines which resulted in substantially lower technical risks with adequate improvements in cost and performance to be attractive to airlines.

The Airbus A320 Neo and Boeing B737 Max series feature new technology engines, airframe materials, computer and control systems.

The outlook from Peterborough's perspective has therefore changed with the next generation aircraft presenting fewer opportunities for higher technology production participation in the future, or maintenance support. These aircraft are just entering airline use.

Bombardier's new 100-150 seat C-Series Jets have been developed to compete against the Airbus A319 and A319 Neo, Boeing 737-700 and B737 Max 7, and Embraer E190-E2, and E195-E2 aircraft in the 100 to 150 seat market. Bombardier forecasts a demand for 7,000 new aircraft in this category over the next 20 years. Participation with Bombardier in the C-Series program through Flying Colours Corporation is the most potentially attractive opportunity available for Peterborough Airport at this time.

Wide-body Aircraft: Demand for wide-body aircraft is currently experiencing a world-wide slump as the acquisition and operating costs of long haul and ultra-long haul twin aisle aircraft has become very costly and the number of routes on which these aircraft may be competitively operated is shrinking. Demand is expected to rebound at some point in the future but there would appear to be no foreseeable business opportunities for Peterborough Airport within the planning horizons of this study.

Business and Corporate Aircraft: The worldwide demand for corporate and business aircraft is expected to grow slowly. Honeywell Aerospace lowered its latest Global Business Aviation Outlook by 6% to 7% in November 2016 to about 8,600 new business jet deliveries. In May 2016, Bombardier Business Aircraft had predicted up to 8,300 new business jet deliveries representing approximately \$250 billion US in industry revenues from 2016 to 2025 in the segments in which it competes. The modest difference in forecasts, and forecast timing suggests some degree of uncertainty in the business and corporate aircraft sector. However, Honeywell Aerospace did predict that 65% of demand will come from North American operators.

Flying Colours Corporation specializes in Bombardier business aircraft from its two locations in Peterborough and St. Louis, MO, USA. Among its most significant programs is the completion of Challenger 850 business jets delivered directly from Bombardier. These are corporate versions of their successful CRJ200LF commercial airliner.

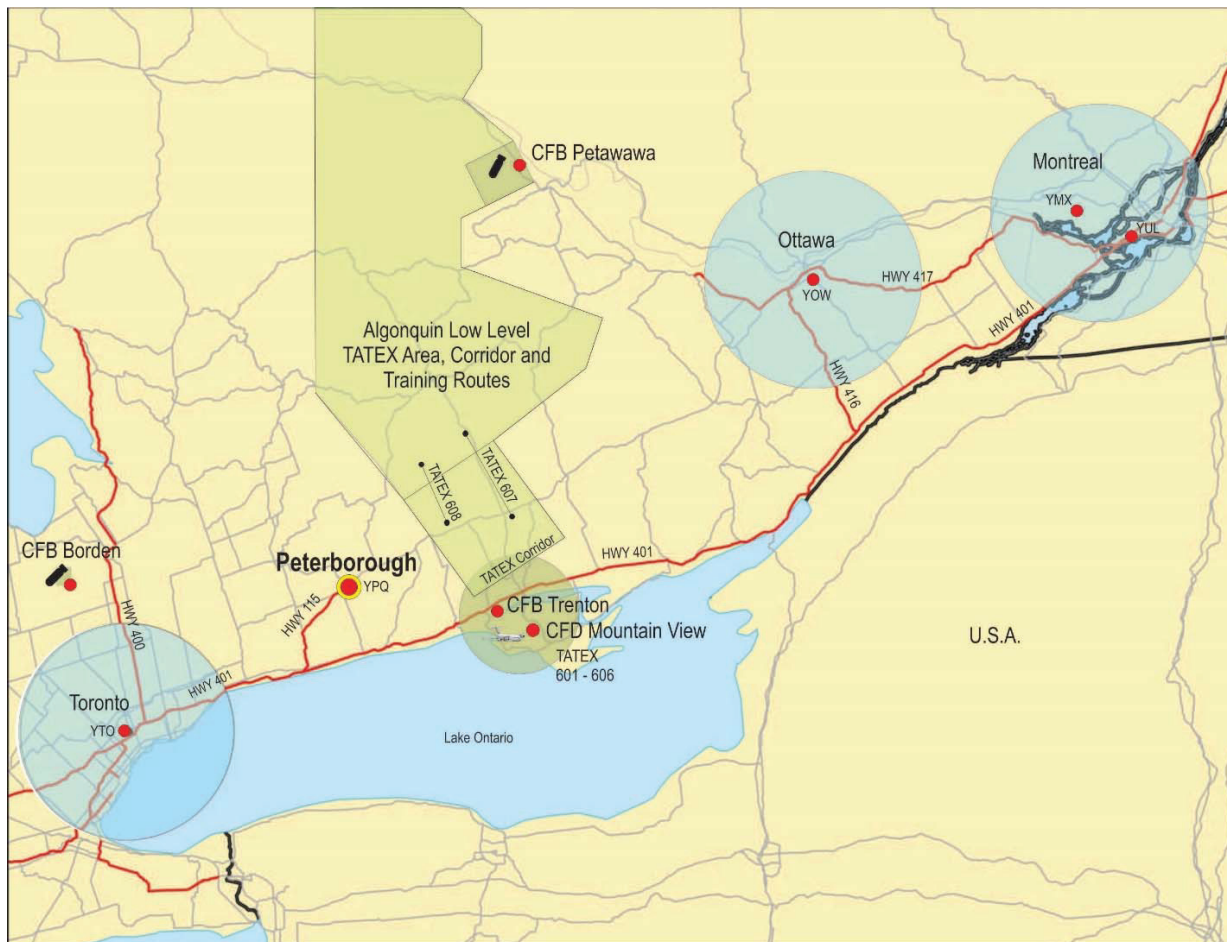
Military: The capabilities of Peterborough Airport, and airport businesses, has been of recent interest to large aerospace organizations bidding major procurement projects for the Department of National Defence. Familiarity with the airport and local businesses has recently been well established with notable multi-national defence prime contractors such as General Dynamics, Boeing, and Airbus as well as Canadian firms such as CAE, PAL Aerospace and others.

The potential size of these projects and the potential level and diversification of participation by Peterborough's industries could easily result in the arrival of a third anchor tenant at the airport in the event the airport is successful in a teaming relationship.

For example, when participating in sub-contractor discussions for the \$2.4 Billion Fixed Wing Search and Rescue Aircraft Project, Peterborough's proposal would have seen construction of a \$32.5 million maintenance hangar at the airport and the establishment of up to 200 new jobs. In April 2017, the Government of Canada announced the award of a contract to Airbus. Peterborough Airport was hopeful to be selected a maintenance support base for the program, however, Airbus indicated that Winnipeg is their preferred location. In addition, these types of major crown contracts often require Regional Industrial Benefits under which the successful prime contractor is required to spend equivalent levels of funds in Canadian university, college and research programs, and with other local industries.

Figure 5.1 is an example of promotional material prepared for multi-national prime contractors and military decision-makers illustrating the proximity of Peterborough to Canada's aerospace supply chain, and to key military facilities and training areas in Ontario.

Figure 5.1 – Peterborough Airport's Strategic Position



5.3.2 Maintenance Repair Overhaul

Companies participating in the MRO sector at Peterborough Airport include Flying Colours Corporation as well as Kadex, Airtech Canada and Toronto Avionics. Local businesses have primarily focused on the business and General Aviation sub-sector which represents about 9% of the total MRO sector activity. Some participation has also taken place providing maintenance for the Civil Rotary Wing sector (3%) (ICF Int'l).

Airport marketing and business development activity has primarily focused on expanding MRO activity at Peterborough Airport. This has taken the form of attendance at aerospace exhibitions and conferences, participation in industry associations, active company and business recruitment initiatives with major aerospace corporations, and pursuit/participation in major government procurement competitions. The industry outlook identifies growth in all areas of the USD 64.3 Billion MRO sub-sector of which 29% is located in North America (ICF Int'l, 2016). The sub-sector is categorized as: Engines; Components; Line Maintenance; Airframe; and Modifications. Peterborough companies have collective capabilities to serve all but the engine category. With the advent of new geared turbofan engines, there is expected to be continued consolidation within the industry of companies capable of maintaining these high tech engines. The outlook is also for significant growth in parallel with the industry, and in each of the sub-sectors listed above with varying applicability for Peterborough.

Regional aircraft growth should present increasing numbers of aircraft requiring heavy maintenance support in Canada. Peterborough Airport has undertaken one significant market investigation and market pursuit and this has revealed that additional modest-cost MRO capacity and facilities are required in Canada.

Narrow-body aircraft growth will result in a pass-down of used airline aircraft to other operators to be modified and/or repurposed. However, many carriers are now cannibalizing their retiring aircraft to achieve cost savings in parts for other aircraft and the supply of used aircraft may be reduced as a result.

Wide-body aircraft growth is likely to be very slow with no resulting opportunities for Peterborough.

Business and Corporate aircraft growth will be slow but should continue to be a source of considerable new opportunities for both Peterborough-based companies and potential outside organizations who might be attracted by the low value of the Canadian dollar against the US dollar. However, the latest buy-in-America political initiatives may impact any decision by a US MRO operator to establish a Canadian branch operation at this time.

Military aircraft maintenance and support is typically carried out under long term contracts with large maintainers who are distributed across Canada. However,

Peterborough's proximity to the southern Ontario's skilled aviation labour market, modest cost of living, proximity to military bases and air test ranges, and central location in the national aerospace supply chain could serve to attract interest by prime contractors bidding on large military support and/or testing contracts. Success in attracting such a long term tenant to the airport would likely result in the appearance of a third large anchor tenant at the airport, and the introduction of a significant number of new jobs into the Peterborough economy.

5.4 General Aviation Activity and Projections

General Aviation (GA) activity is measured in aircraft movements, where one movement is either a take-off or a landing at an airport. Movements are classified as either "itinerant" where an aircraft arrives from or departs to another airport, or "local" where an aircraft takes-off and lands at the same airport.

General Aviation is typically a forecasting challenge. General Aviation operations at any airport are usually very specific to the region, its economic base, its employers, natural resource activity, and the particular circumstances of each operator. General Aviation runway activity seldom shows any significant correlation to socio-economic variables. These generalizations apply to Peterborough Airport.

General Aviation activity has experienced a steady decline throughout most of Canada. Between 2000 and 2014, itinerant movement activity fell by 39.5%. Local General Aviation movements fell by 23.0 % nationally. Combined General Aviation itinerant and local movements fell by 29.7%. High fuel costs, product liability concerns, greater urbanization, reduced resource exploration/extraction activity and an aging aircraft fleet have contributed to this long term decline.

Seneca College makes extensive use of the airport for its training programs. It accounts for a large portion of the local movements. Its flight activities in turn depend on its ability to attract students and to obtain contracts for crew training. Its competitors include professional flight schools around the world, the instruction networks of CAE, Boeing and others, and lower cost flight training companies and clubs at small airports across Canada. The value of the Canadian dollar is important to Seneca's ability to compete for international students. Forecasts of Seneca College's runway activity require a detailed knowledge of the school's business strategies and economics and will vary by season and weather.

Flying Colours Corporation uses the main runway occasionally as aircraft are brought in for refurbishing or depart for delivery. However, each visit is a very significant source of local economic activity and the level of runway use can be a misleading indicator of the economic impact of Flying Colours Corporation's operations.

Many other General Aviation users frequent the airport and range from local residents and visiting itinerant recreational flyers to corporate and business aircraft, charter operators and military aircraft from nearby CFB Trenton. The extension of the main runway, Seneca's relocation to the Peterborough, and expansion by several airport tenants present major challenges for forecasting General Aviation activity. Neither previous airport movement history nor a cross-sectional approach (examining other "similar" airports) can be relied upon for developing rigorous forecasts. General Aviation is dynamic, and local by nature. Significant increases or decreases in traffic could occur with the arrival or departure of a single tenant. Such an increase was observed in 2014 with the introduction of Seneca College at the airport. The increase or decrease of General Aviation activity at surrounding airports is also not a reliable metric to predict activity at Peterborough Airport. The growth described above is shown in Figure 5.2.

Figure 5.2 – General Aviation Hangar Growth at Peterborough Airport



Source: Google Earth

Due to the diversity of General Aviation users and changing conditions, the forecasts for Peterborough Airport rely on key econometric trends, such as the growth of civil aviation in Canada and worldwide. The forecasts consist of three sets of scenarios:

Low Growth Scenario: Itinerant and Local General Aviation activity will grow at the same rate as the Canadian GDP under the Medium growth scenario.

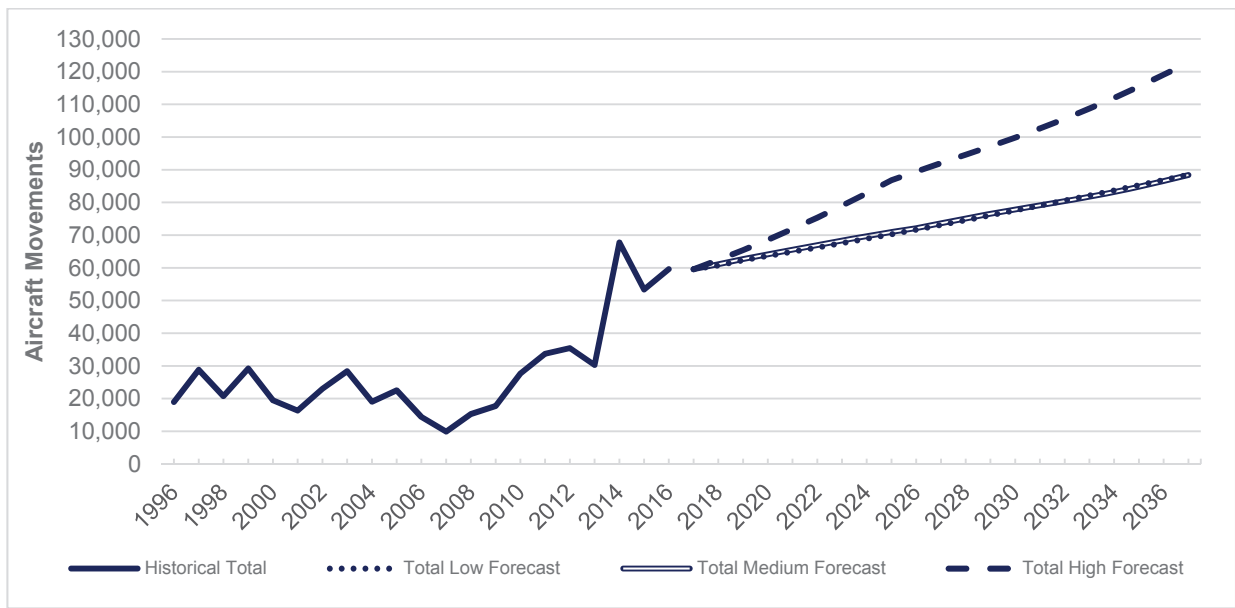
Medium Growth Scenario: Itinerant and Local General Aviation activity will grow at the same rate as the Canadian airline industry's growth rate as measured in revenue passenger-kilometers. This follows the rationale that an expanding airline industry will stimulate flight crew training at institutes such as Seneca College.

The airline industry has exhibited a long term trend of growing faster than the economy at large. It does, however, have much greater volatility. Some observers have noted that airline growth rates tend to change at twice the rate of change of the GDP.

High Growth Scenario: Itinerant General Aviation activity will expand at 4.82% per year through to 2040. This aggressive growth rate reflects the recent capital improvements, the closing of Buttonville Airport, and the airport’s growing maintenance/repair/overhaul industry. This sector serves customers throughout the world. Its business will most likely grow at similar rates as the worldwide commercial aviation sector. Boeing has forecast a compounded annual growth rate of 4.82% through to 2035. Local General Aviation movements will also expand at the 4.82% annual rate until 2025. Many airports could support flight schools. The forecasts assume that from 2025 to 2040, local movements at Peterborough will grow at the same rate as the high growth case for the Canadian airline industry.

Figure 5.3 summarizes the General Aviation forecasts for total Itinerant and Local movements. Appendix C shows detailed forecasts.

Figure 5.3 – Historical and Forecast General Aviation Movements - Peterborough Airport



Note: Total traffic movement for the 2014 calendar year is an anomaly due to Statistics Canada formula application. Aircraft movement statistics formula corrected from 2015 onward.



5.5 Passenger Activity and Forecasts

5.5.1 Charter Flight Activity

Historically, a number of airlines have attempted to serve the Peterborough market with limited success in achieving sustainable operations over an extended period. The most notable airlines included Great Lakes Airlines operating CV-580 aircraft and Air Otonabee operating ST-27 aircraft. Otonabee Airways was founded in 1971 and was renamed Air Atonabee in 1980. In 1984, Air Atonabee's was sold and reorganized as City Express based at Toronto Island Airport. A more recent history of passenger charter services at Peterborough Airport is described in the following sections.

5.5.1.1 Stewart Travel Vacation Charters (B737)

To celebrate its 40th anniversary in 2014, Stewart Travel offered an exclusive weekend vacation package with round trip air service departing from Peterborough Airport. Since then, Stewart Tours (a member of Carlson Wagonlit Travel) has been operating tours to leisure destinations on B737-300/400 and DHC-8 400 type aircraft. The tours attract a niche market of travellers, offering all-inclusive, premium "4 day weekend" vacations with included round trip airfares. Approximately 726 passengers purchased tickets for charter air services in 2016. Past destinations included:

- ▶ Nashville, Tennessee;
- ▶ New Orleans, Louisiana;
- ▶ Boston, Massachusetts;
- ▶ New York City, New York; and
- ▶ Chicago, Illinois.

First Air, Canadian North, Porter, and Nolinor operated the charter flights for these vacations. Typically, the flight departs on Thursday and returns to Peterborough on Sunday, as the charter carriers have aircraft availability on these days. The Loomex Building is used for passenger processing activities with temporary amenities set-up for each trip. The accommodations for charter flight handling include a baggage drop off area, security screening area, a holdroom, and bus transportation to a remotely parked aircraft on Apron II. Passengers park in the main parking area near the public terminal building. Security screening is contracted to GARDA under the jurisdiction of CATSA with manual baggage and passenger screening techniques employed. There are no baggage x-ray screening machines available. Initially, Stewart Travel leased a City Bus from the City of Peterborough but has since purchased its own bus dedicated for air charter operations.

Canadian Border Services Agency provides customs services for passengers and crews arriving from the United States. This service is provided by pre-arrangement and on a cost recovery basis.

Customs screening for charter flights is conducted in the Loomex building. As with the departure day setup, arrival setup and customs facilities are temporary and have to be setup and torn down with each arrival and departure.

5.5.1.2 Commuter Air Services

Peterborough Airport has seen commuter air services in the recent past. Recently, the business model of a company selling tickets on regularly chartered flights has come into popularity. Under this model, flights are operated by established charter airlines and tickets on these flights sold by the ticket reseller. These flights often operate using 9-seat Beechcraft King Air and 19-seat Beechcraft B1900 aircraft. Historical destinations from Peterborough Airport included:

- ▶ Region of Waterloo International Airport;
- ▶ Ottawa-Gatineau Airport; and
- ▶ Montréal – Pierre Elliot Trudeau International Airport.

Such a service operated flights briefly in the spring of 2016 but subsequently failed. While operating, this service was in high demand and public response was extremely positive. The operations of the service were flawed, with a poor business plan, mismanagement of flight coordination, no fixed office location and insufficient capital to absorb losses on flights with lower load factors. It is expected that a small commuter type air service is fully sustainable from a demand standpoint and that an operator with more experience and capital could run such a service profitably.

5.5.1.3 Growth Expectations

Stewart Travel has conducted approximately 3 tours each year, seasonally between April and October. The company believes demand for these tours is high, citing that the lowest load factor on any tour to date has been 82% with 112 of 136 seats occupied. Generally load factors have averaged 85% to 90%, although Stewart Travel has reported that these load factors could be higher (up to 100%), if the displaced threshold associated with Runway 27 is removed and 7,000' of landing distance is made available for charter aircraft. In 2017, Stewart Travel expected to double their activity offering 5 to 6 flights to leisure destinations.

Section 5.5.2 details the growth potential for the charter market. Currently, the calculated passenger demand for leisure charters is 2,620 enplaned and deplaned passengers per year, indicating an untapped demand of 1,894 passengers per annum, or an additional 8 round trip tours on top of 2016 schedules. This further passenger demand currently not being served by the airport is potentially “leaking” to other airports or jurisdictions. There is strong desire by the tour operator to increase capacity for passenger processing, but such an undertaking is difficult without proper facilities. Growth of this segment, is being limited significantly by the lack of a designated

customs and passenger processing facility capable of handling aircraft with capacities up to 200 passengers. If an appropriate facility can be provided, attracting on-site customs and security services will be increasingly justified. Adding these services to the airport will not only benefit the travelling public, but also existing airport tenants and users.

The adoption of a multi-use facility that allows for dynamic space utilization could allow for continued revenue generation during downtime between charter flights (i.e. the facility could be used for non-aviation purposes such as conference, trade shows, and other events. A full service FBO would be a suitable and compatible business to be a tenant in such a facility.

5.5.2 Charter Market Projections

Market liberalization has almost eliminated the distinction between “charter” and “scheduled” services. Charter companies can now sell air transportation on a return and one-way basis. Some use their own aircraft and others contract flying to scheduled airlines. The scheduled airlines operate flights on both a scheduled basis and on contract with tour wholesalers, providing fully competitive services. Some charter flights operate daily, year-round on fixed schedules. They may carry more than 100,000 passengers per year. Many smaller Canadian communities enjoy charter flights to the US south, Mexico, and the Caribbean. The flights operate during peak periods, often with 1 to 2 flights weekly. Such services are a realistic target for Peterborough Airport now that the concept has been proven successful by Stewart Travel.

In recent years aircraft serving regional markets as part of major airlines and having less than 70 seats have been found to have very high operating costs per available seat-kilometer. Major airlines are progressively eliminating many such turboprop and regional jet equipment from their fleets. Most passengers today expect high frequency services, and small airports with limited services cannot compete effectively with large, well-served airports in the same region.

Theoretically, a major airline could initiate scheduled services at Peterborough Airport. However, passengers and major airlines have strong inertia in favour of existing airports. Establishing a 2 or 3 times daily large-scale scheduled service at Peterborough (typical start-up frequencies) would require significant fixed cost investments. Other secondary airports, serving much larger urban populations such as Hamilton and Waterloo, have had difficulty attracting and maintaining high frequency scheduled services.

Peterborough Airport has had intermittent scheduled services and the passenger forecasts provided herein do not call for resumption of scheduled services.

Peterborough Airport is actively pursuing commuter-type charters.

Peterborough Airport has a lengthy history of accommodating commuter air service flights by small aircraft.

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These flights serve the general public and business travelers using business jets and turboprop aircraft, usually with fewer than 19 seats. These type of flights are an important source of revenue to Fixed Base Operators (FBOs) and the airport proper. Peterborough Airport could reasonably sustain such a service and the Air Terminal Building has been sized to accommodate this type of service.

Peterborough Airport's 7,000' long runway can now accommodate larger aircraft used by commercial airlines and major corporate operators. Aircraft such as the 180-seat B737-800 can serve mass-market charter flights to the US Sunbelt, the Caribbean and Mexico. The largest corporate aircraft are of similar size. This is a distinctly different market than the airport's traditional charter business. Recent charter flights by airline-size aircraft have demonstrated their potential at the airport. Table 5.1 displays recent activity.

Table 5.1 – Charter Flights by Airline-sized Aircraft - Peterborough

Year	Carrier	Destination	Passengers	E/D	Total E/D
2014	Canadian North	New York City	136	272	544
	Canadian North	New York City	136	272	
2015	Porter	Chicago	61	122	394
	Canadian North	New Orleans	136	272	
2016	First Air	New Orleans	118	236	726
	First Air	Nashville	133	266	
	First Air	Boston	112	224	

The forecasts presented herein use a Canada-wide estimate for per capita charter flight use. Statistics Canada Report 51-203, "Air Carrier Traffic at Canadian Airports" and United States Department of Transportation Database 28IM provide information about charter traffic at Canadian airports. Neither report clearly distinguishes between charter and scheduled flights. The Canadian report excludes many communities for data confidentiality reasons. The estimated trans-border and international charter volumes used for the forecasts exclude city-pairs with scheduled services. International totals derived from the Canadian report, exclude any Canadian city with international scheduled services and Canadian cities for which no international entries are shown. This places a strong conservative bias on the calculated rates and the resulting forecasts. The calculated passenger volumes, when compared to the Canadian population, provide a charter traffic per capita rate. This rate, when applied to the combined population of the cities of Peterborough and Kawartha Lakes, implies a target of 2,620 enplaned-deplaned charter passengers per year from the Peterborough / Kawartha communities for 2016.

Some of these passengers will continue to board charter flights at Toronto Pearson. Conversely, Peterborough Airport may attract charter passengers from Oshawa, Whitby, Coburg, and points to the north and east. The forecasts exclude these peripheral sources of traffic.

Two processes will drive Peterborough's large aircraft charter traffic. Canada's airline industry will continue to grow, and the calculated target of 2,620 passengers per year will increase accordingly. The runway extension is relatively recent, and Peterborough Airport in 2016 handled fewer passengers than its 2,620/year pro-rata share. It can therefore expect accelerated growth for an initial period. The forecasts therefore depend on the aggregate growth of the Canadian industry, the attainable target for Peterborough and the accelerated growth path it leads to reach the target. These factors define the low, medium and high targets provided in Table 5.2.

Table 5.2 – Large Aircraft Charter Market Growth Assumptions

Case	2016 Base	Annual Growth to Target	Annual Growth After Reaching Target
Low	Current volume of 726 passengers per year	Not applicable.	Canadian airline industry revenue passenger-kilometers – medium growth case
Medium	50% of target -1,310 passengers per year	15% per year	Canadian airline industry revenue passenger-kilometers – medium growth case
High	Target volume of 2,620 passengers per year	15% per year	Canadian airline industry revenue passenger-kilometers – high case. Strong GDP growth, favorable cost environment

The forecasts for all cases use an econometric model to predict future traffic. The Air Canada and WestJet annual reports and financial statements have tables showing passenger revenues and revenue-passenger kilometers flown. They together show the national volume of traffic and the average yields per revenue passenger- kilometer¹⁰. Future projections of the national GDP were based on forecasts of the chartered banks, the Bank of Canada and the International Monetary Fund. Future yields consider probable escalations of unit costs. These assumptions, when superimposed on the model, produce forecasts of national aviation activity.

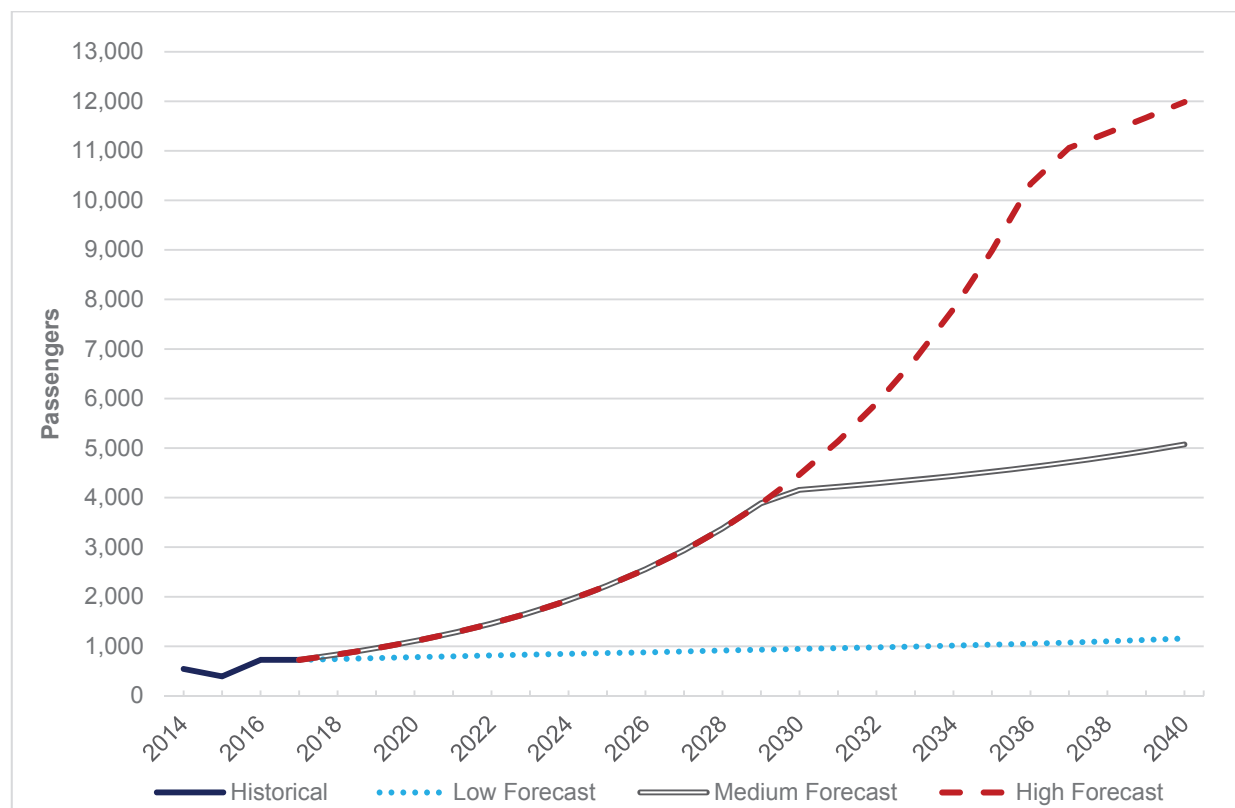
The forecasts of aircraft operations assume a 75% load factor and aircraft with a capacity of 180 passengers.

¹⁰ The combination of Air Canada and WestJet provides a proxy of the size of the Canadian industry. Some companies such as Porter, Sunquest and other carriers do not disclose volume or yield metrics. Statistics Canada has industry-wide consolidated statistics, but revenues are absent in several key years.



Aircraft used for high volume charter flights tend to have high density seating to compensate for the relatively low fares paid by discretionary travelers. The load factor is somewhat low, and assumes the season will be too short to permit full “back-to-back” flights. Figure 5.4 summarizes historical passenger volumes and the low, medium and high forecasts. In order to maximize available load factors on leisure charter flights, the displaced threshold of Runway 27 will require removal, which is recommended within the short term. Appendix C provides forecast passenger activity in a table.

Figure 5.4 – Forecast of Large Aircraft Charter Activity – Peterborough Airport



5.6 Design Aircraft

Confirmation of the design aircraft for the future is an essential consideration in developing the Peterborough Airport Strategic Development Plan. The current design aircraft for Peterborough Airport is the Boeing Business Jet 3 (BBJ3). This is a modified version of the standard passenger Boeing B737-900 which is the largest narrow-body aircraft currently in use in Canadian charter operations.

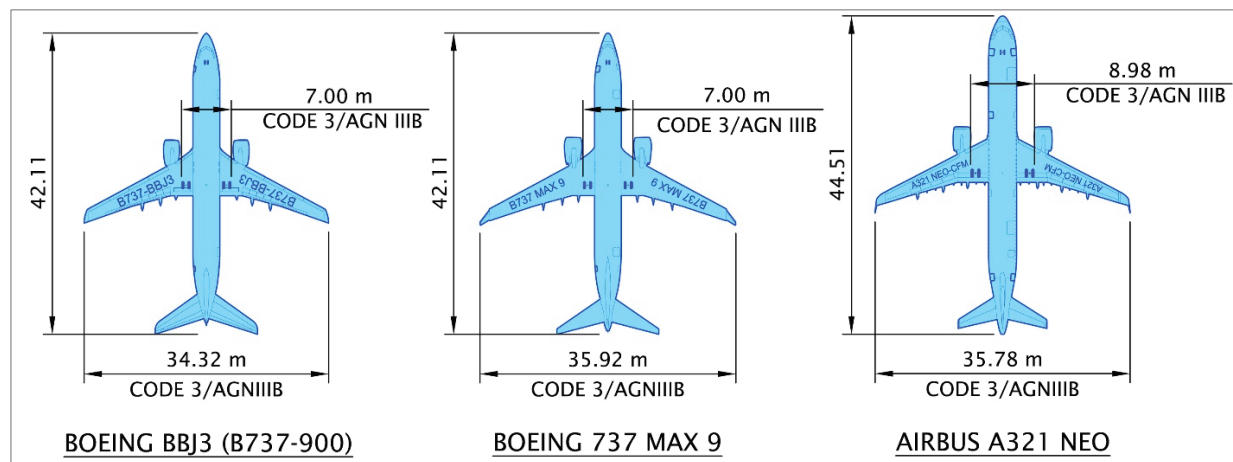
Recent technological advances have encouraged both Boeing and Airbus to launch new narrow-body programs, namely the B737 MAX 9 and the Airbus A321 Neo. The use of composite materials and improved turbo-fan engines in these aircraft will provide significant economic benefits to operators. The physical dimensions of these aircraft are presented in Figure 5.7.

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These aircraft will be able to utilize Peterborough Airport's existing infrastructure as they share a common Aircraft Group Number (AGN) pursuant to Transport Canada's document Aerodrome Standards TP312 5th Edition.

Consequently no change in the designated design aircraft for Peterborough Airport is contemplated in the Strategic Development Plan; however, new airside elements have been planned and designed using the new TP312 5th edition standards. A general comparison of aircraft dimensions is provided in Figure 5.5.

Figure 5.5 - Comparison of Design Aircraft with Next-Generation Narrow-body Aircraft



6.0 AIRPORT INFRASTRUCTURE REVIEW

6.1 Master Plan Build-Out

The City of Peterborough undertook a comprehensive Airport Master Plan in 2009, following the 2008 Business Case for Infrastructure Development, with the aim of determining the most effective balance between opportunity and feasibility with respect to infrastructure investment at Peterborough Airport.

The Master Plan provided development recommendations in phases to support the existing traffic levels as well as forecasted growth. The recommendations included airside development, groundside development, construction of an Air Terminal Building and other projects within a 20-year planning horizon.

In the short term, the Airport Master Plan recommended extending Runway 09-27 to 7,000' and strengthening the primary runway, Taxiway 'A', Taxiway 'B' and a portion of Apron I to support Boeing 737-900 operations. It recommended that Taxiway 'B' be extended to a partial parallel taxiway connecting to the easterly threshold of Runway 27 to facilitate efficient aircraft circulation.

Medium and long term development recommendations included the 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, and an extension of Taxiway 'B' to a full length parallel taxiway connecting to the threshold of Runway 09.

The airport has completed many of the projects recommended in 2009, warranting additional infrastructure planning and the preparation of this Strategic Development Plan. A list of development recommendations from the 2009 Airport Master Plan is shown in Table 6.1. In addition, the 2009 Master Plan development recommendations are provided in Figure 6.1.





Title
MASTER PLAN

Notes
 - Existing Boundary
 - Additional Land Required

Figure No.	7-1
Drawn By	HK
Approved By	RAM
Date	September 2009
Scale	N.T.S
Filename	AIRPORT H.K.

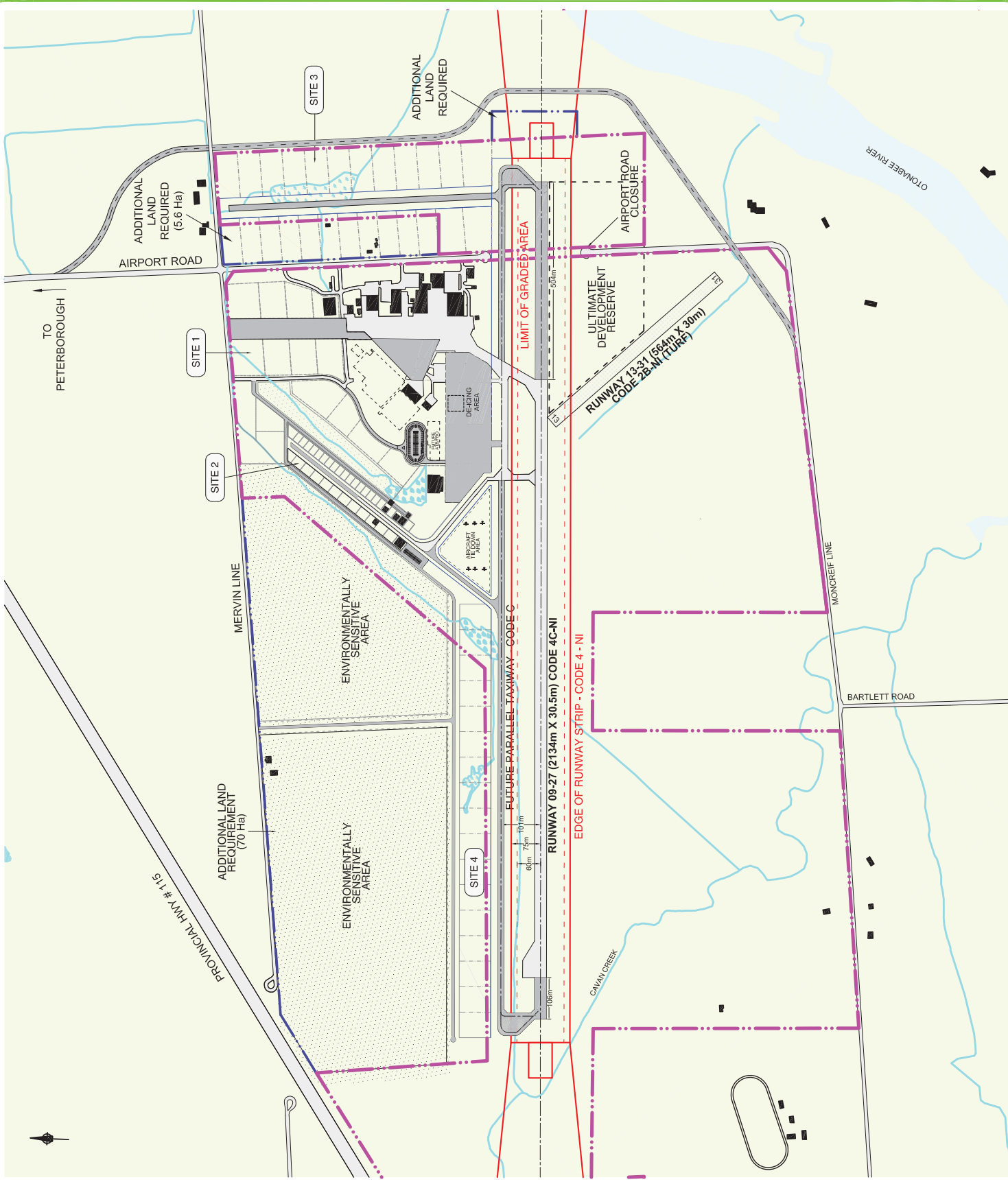


Table 6.1 – 2009 Airport Master Plan Development Recommendations

Year	Airside	Groundside	ATB and Other
Short Term (2009 – 2014)	<p>Completed:</p> <ul style="list-style-type: none"> ▶ Extend Runway 09-27 to 2,134m ▶ Extend Taxiway 'B' to New Threshold of Rwy 27 ▶ Expand Apron I to North ▶ Strengthen Existing Runway ▶ Strengthen Existing Taxiways 'A' & 'B' ▶ Strengthen Apron I ▶ Construct Apron II ▶ Relocate Aircraft Tie-down Area ▶ Realign and Pave Crosswind Runway <p>Outstanding: None</p>	<p>Completed:</p> <ul style="list-style-type: none"> ▶ Relocate or Close Airport Road ▶ Industrial Lot Preparation East of Apron I ▶ Service Industrial Lots West of Apron I ▶ Realignment of Mel O'Brien Way ▶ Ramp Extension Servicing to Mervin Line ▶ General Aviation Lot Preparation ▶ New Terminal Area Servicing ▶ Provide Aircraft Tie-down Vehicle Parking ▶ Construct Access Roads Behind General Aviation Lots ▶ Prepare Groundside Commercial Lots ▶ Service Groundside Commercial Lots <p>Outstanding: None</p>	<p>Completed:</p> <ul style="list-style-type: none"> ▶ Initiate Environmental Assessment Process for Short and Medium Term Developments ▶ Private Hangar Acquisitions/Relocation ▶ Develop ATB/FBO Facility and Parking Area ▶ Permanent Drainage Improvements (Apron I and General Aviation Area) ▶ Purchase Additional Lands East of Airport Road (East Development Area) ▶ Commission Airport Marketing Study ▶ Commission Airport Governance Study <p>Outstanding: None</p>



Medium Term (2015 – 2020)	<p>Completed:</p> <ul style="list-style-type: none"> ▶ Construct Code C Taxiway to Service Industrial Lots – (East Development Area) ▶ Extend Apron I ▶ Extend Apron II <p>Outstanding: None</p>	<p>Completed:</p> <ul style="list-style-type: none"> ▶ Construct New Airfield Maintenance Building. <p>Initiated:</p> <ul style="list-style-type: none"> ▶ Prepare Industrial Lots – (East Development Area) <p>Outstanding:</p> <ul style="list-style-type: none"> ▶ Service Industrial Lots – (East Development Area) (Funding Available) 	<p>Completed:</p> <ul style="list-style-type: none"> ▶ Update Forecasts <p>Outstanding:</p> <ul style="list-style-type: none"> ▶ Acquire Additional Land to Support Development of West Development Area
Long Term (2021 – 2030)	<p>Completed: None</p> <p>Outstanding:</p> <ul style="list-style-type: none"> ▶ Extend Taxiway 'B' to Rwy 09 Threshold 	<p>Completed: None</p> <p>Outstanding:</p> <ul style="list-style-type: none"> ▶ Long-Term Development Area Lot Preparation (West Development Area) ▶ Construct New Access Road From Mervin Line to Long Term Development Area (West Development Area) ▶ Service Long Term Development Area (West Development Area) ▶ Prepare remaining Industrial Lots – (East Development Area) 	<p>Completed: None</p> <p>Outstanding:</p> <ul style="list-style-type: none"> ▶ Expand ATB if necessary

Note: The realignment and paving of the crosswind runway was not included as an infrastructure requirement in 2009 Master Plan.



6.2 Capabilities, Deficiencies and Requirements

The capabilities of the primary infrastructure elements at Peterborough Airport have been assessed against the projected requirements and future activity projections contained in the Strategic Development Plan and deficiencies have been identified for improvement.

6.2.1 Regulatory Changes in Transport Canada Aerodrome Standards

For many years, Transport Canada has been working to create an update (5th Edition) to Aerodrome Standards and Recommended Practices TP312 4th Edition, introduced in 1993.

The premise of TP312 5th Edition was that it would be based on operational aircraft characteristics as opposed to the design based concept presented in previous versions (4th Edition). The design-based concept had been applied to the construction or repair of facilities and focused on the runway length and aircraft size. The operational concept in 5th Edition focusses more the operational needs of the aircraft serving the airport than on the length of the runway or size of the aircraft. This has constituted a major change in thinking and potentially in the application of the standards across Canada.

TP312 5th Edition was promulgated in September 2015. At this point in time, Transport Canada identified that airports in Canada could continue to operate to 4th Edition as they had for the past 22 years; however, in the event of operational usage changes or level of service changes, an airport would need to comply with the most current 5th Edition standards.

Though a draft version had previously been developed and shared with industry, the final version of TP312 5th Edition contained differences from the draft. The changes to TP312 will impact all Canadian airports to varying degrees. A major change between 4th and 5th Editions is that the 5th Edition is made up of standards exclusively. While 4th Edition contained standards and recommendations, the recommendations have either been removed completely or adopted as new standards with the new 5th Edition document.

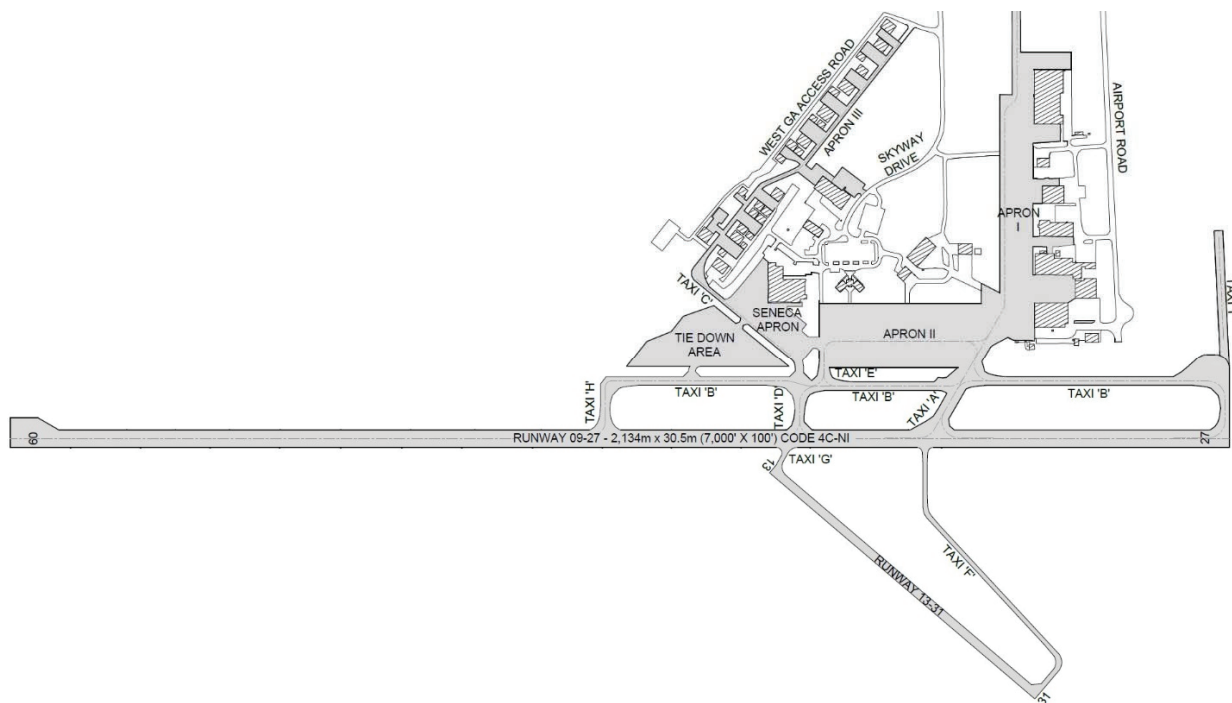
Transport Canada identified a three (3) year phase-in period to allow airports time to review the applicable standards and make any necessary changes to their Airport Operations Manuals (AOMs) and Aeronautical Information Publications. At the end of the three year period NAV CANADA will ensure that the Aircraft Group Number (AGN) for each runway will be published in the Canada Flight Supplement. In addition to this, airports will need to identify the appropriate AGN(s) in their AOMs.

Peterborough Airport is currently completing a study to assess whether the designation of the runway approaches can be improved from Non-Instrument to Non-Precision.

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The study consists of a full TP312 5th Edition gap analysis, which compares 4th Edition standards and 5th Edition standards, and evaluates any impacts that may require corrective action in the future. The study will develop a Non-Precision Operations Plan with the intent to improve runway level of service utilizing the new standards, potentially allowing for lowered instrument flight procedure minima for Runways 09 and 27 (as low as 250' AGL). Lower instrument flight minima achieved from improving the approaches to Non-Precision will allow aircraft to land in poor weather and other reduced visibility conditions. Airport businesses will directly benefit from the resulting increase in airport availability. All airside infrastructure elements outlined and planned as part of this Strategic Development Plan adhere to the new Transport Canada 5th Edition standards.

6.2.2 Airfield Infrastructure



6.2.2.1 Runway 09-27

Runway 09-27 is the primary runway at Peterborough Airport. It has the dimensions of 2,134 m x 30.5 m (7000' x 100'). The asphalt runway is certified as a Code 4C – Non-Instrument facility. The runway's graded area is currently 60 m (200') on either side of the runway centreline. The purpose of the graded area is to provide a flat surface free of obstacles in the event of an aircraft runway excursion. Under new TP312 5th edition standards the runway will be classified as an AGN IIIB Non-instrument facility. The declared distances for Runways 09 and 27 are provided in Table 6.2.

Table 6.2 – Runway 09-27 Declared Distances

Declared Distance	Runway 09	Runway 27
Takeoff Run Available	7,000 ft.	7,000 ft.
Takeoff Distance Available	7,295 ft.	7,295 ft.
Accelerate Stop Distance Available	7,000 ft.	7,000 ft.
Landing Distance Available	7,000 ft.	5,349 ft.

Issues to Address

The current 1,651' displacement of the threshold of Runway 27 should be removed in the short term and the full runway length should be made available for use to eliminate potential operating restrictions associated with the landing distance available and contaminated runway surface. Design of new Instrument Flight Procedures (IFPs) will be required once the full length of Runway 27 is made available and the displaced threshold is removed.

The length and width of Runway 09-27 are sufficient for current operational aircraft as well as the design aircraft (Boeing B737 MAX 9 and Airbus A321 Neo). The 7,000' runway length is sufficient to serve the airport's current and anticipated roles beyond the planning horizon.

It is recommended that the obstructions (trees) necessitating the displacement of the threshold of Runway 27 be removed in the short term to allow the declaration of 7,000' of Landing Distance Available (LDA) in that operating direction.

Runway 09-27 currently has a graded area of 60 m on each side of the centreline. The new Transport Canada Standard TP312 5th Edition requires a 75 m distance from centreline for a runway safety area (referred to as the graded portion of the runway strip in 4th Edition) on both Non-Precision and Non-Instrument AGN IIIB runways. Should Runway 09-27 be designated as a Non-Precision facility in the future, the graded area must be widened by 15 m to 75 m. A study is currently underway to evaluate possible operational procedures to improve level of service on Runway 09-27 to Non-Precision.

6.2.2.2 Runway 13-31

Runway 13-31 is the secondary crosswind runway at Peterborough Airport. Crosswind runways are typically provided to improve airport availability in crosswind conditions for smaller light aircraft. This runway is asphalt surfaced with dimensions of 610 m x 15 m. (2,000' x 49'). Due to its short length, it is used exclusively by light aircraft for flight training and recreational use. Runway 13-31 and Taxiways 'G' and 'F' were constructed in 2013.



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In the previous 2009 Airport Master Plan, it was determined that a crosswind runway did not significantly increase airport availability, as conditions of crosswinds greater than 15 knots at 90 degrees to Runway 09-27 were infrequent.

Issues to Address

No runway deficiencies have been identified.

Requirements

As the location and alignment of Runway 13-31 does not interfere with development in the core area there are no identified requirements for changes to this Runway within the planning horizons of the Strategic Development Plan.

6.2.2.3 Taxiways

Peterborough Airport's airside system consists of the following taxiway infrastructure:

Taxiway 'A' is approximately 25 m in width and connects Apron I and II to Taxiway 'B', Runway 09-27 and Taxiway 'F' which leads to the threshold of Runway 31. It is classified as a Code C taxiway.

Taxiway 'B' is the principal taxiway parallel to Runway 09-27. It is 15 m wide for its entire length and classified as a Code C taxiway. The taxiway extends from the threshold of Runway 27, and extends eastward to Taxiway 'H', which connects to the primary runway's approximate halfway point.

Taxiway 'C' is 7.5 m in width connecting Apron III (General Aviation area), Seneca College and the Aircraft Tie Down Area to Taxiway B. The taxiway is designated as Code A, supporting light General Aviation activity.

Taxiway 'D' is 15 m wide and connects parallel Taxiway 'B' to Runway 09-27 and Taxiway 'G'. It is a Code C facility.

Taxiway 'E' is 18 m wide Code C taxiway, connecting Apron II with Taxiway 'B'.

Taxiway 'F' is 7.5 m wide Code A taxiway. It connects Runway 09-27 to the threshold of Runway 31.

Taxiway 'G' is 7.5 m wide Code A taxiway connecting the threshold of Runway 13 and Runway 09-27.

Taxiway 'H' is 15 m wide Code 'C' taxiway connecting Taxiway 'B' to the approximate midpoint of Runway 09-27.

Taxiway 'I' is a newly-constructed 15 m wide Code C taxiway. It extends from the holding bay on Taxiway 'B' at the threshold of Runway 27 northward.

Issues to Address

The distance from the centreline of Runway 09-27 to the centreline of Taxiway 'B' is approximately 93 m with the taxiway initially designed to support a Code 3 Non-Precision runway (TP312 4th Edition).



Transport Canada's new standard (TP312 5th Edition) requires a minimum taxiway offset of 93 m for AGN IIIB Non-Instrument runways and 122 m for AGN IIIB Non-Precision runways. Taxiway 'B' currently meets the requirements for an AGN IIIB Non-Instrument runway designation, but is too close to the runway centerline for a Non-Precision runway. Upgrading the designation of Runway 09-27 to a Non-Precision runway will pose challenges due to the close proximity of Taxiway 'B' to Runway 09-27.

The extension of Taxiway 'B' westward to Runway 09 is planned to be 122 m from the centreline of Runway 09-27 to meet the new standard for an AGN IIIB Non-Precision runway facility. However, at this offset the current fence and property line would penetrate the obstacle free taxiway strip, meaning that additional lands will need to be acquired to support construction of this taxiway.

Taxiway 'C' currently provides access to Apron III, Seneca College's Apron and the Tie Down Area. Taxiway 'C' has multiple ingress and egress points with many intersections where risks of conflicts and incursions exist. As a result, consideration should be given to realigning Taxiway 'C' to bisect the current tie-down area. This would facilitate the separation of private General Aviation traffic from Apron III and Seneca College's flight operations.

Requirements

To achieve Non-Precision designation for Runway 09-27 and improved airport availability, it is recommended that further study of physical and operational solutions to the Taxi 'B' centreline offset restriction preventing Non-Precision operations be identified in the short term.

It is recommended that additional land north of the property boundary between Taxiway 'H' and Runway 09-27 be acquired to permit Taxiway 'B' extension westward, and to allow future development on abutting lands to support commercial General Aviation activities. The extension of Taxiway 'B' would result in immediate and measurable improvements in runway capacity while making additional lands available for commercial development. The extension of this taxiway will improve overall margins of safety and capacity of the airfield system, among other benefits identified above.

It is recommended that Taxi 'C' be realigned to provide direct access between Apron III and Taxiway 'B' and to relieve congestion, reduce conflict points, and allow for future expansion of the Seneca College Apron. The realignment of Taxiway 'C' should be completed in conjunction with Seneca College's apron expansion, when required.

It is recommended that Taxiway 'B' be extended, meeting AGN IIIB Non-Precision requirements, to provide additional runway capacity for Runway 09-27. It should be constructed progressively as traffic growth warrants, but is recommended in the short term. An aircraft holding bay should be provided on Taxiway 'B' near the threshold of Runway 09 to permit aircraft run-up space and efficient aircraft movement flows.



Consultation with NAV CANADA suggests that the extension of Taxiway 'B' to Runway 09 would be the most influential infrastructure addition to improve the safety of airport operations.

It is recommended that Taxiway 'F' be widened in the medium term to AGN II minimum width between Runway 09-27 and the southern extent of the South Development Area to allow AGN II aircraft and smaller to access the proposed t-hangars and private hangars.

In order to support the further development of industrial lots in the East Development Area, **it is recommended that Taxiway 'I' be extended further to the north in the medium term.**

The timing of additional taxiway development will ultimately depend on aircraft movement demand and demand for airside lots. Taxiways not identified within this strategic plan may also be required to support unforeseen airside developments.

6.2.2.4 Aprons

Peterborough Airport's airside system consists of 3 public aprons and 2 private aprons. Apron capabilities and roles are as follows:

Apron I is approximately 33,000 m² in area and primarily used for Industrial Aviation and commercial purposes. Apron I has a Code C taxilane extending north-south along its western edge. Apron I accommodates a variety of aircraft types including the Bombardier Regional Jet series, Bombardier Global Express, Gulfstream G550, Cessna Citation and smaller aircraft. On the east side of Apron I there are 10 Code A aircraft tie-down spots used by flight training and aircraft maintenance organizations.

Apron II is approximately 30,000 m² in area and primarily used for itinerant airport parking, General Aviation and Air Terminal parking. It has a Code C taxilane extending in an east-west direction. Apron II accommodates aircraft such as B737 series, military C130 Hercules, Bombardier Regional Jet and smaller aircraft. Apron II also supports passenger charter aircraft operations. The south side of the apron has 13 Code A (AGN I) aircraft tie down positions.

Apron III is approximately 3,700 m² in area and is the primary access to the airport's General Aviation area. Many airport tenants have private aprons connecting to Apron III. Apron III is supported by a Code A (AGN I) taxilane. This apron is restricted to light General Aviation aircraft.

The Seneca College Apron provides access and aircraft parking for Seneca College's flight training program. It has an asphalt surface and has a Code A (AGN I) taxilane.

The Tie Down Area accommodates mostly privately owned Code A light aircraft. The apron is currently surfaced with compacted granular recycled asphalt product, with two hot mix applied asphalt taxilanes.



The apron has tie-down positions for up to 27 Code A (AGN I) aircraft.

Issues to Address

Apron III, which currently serves the General Aviation area, experiences congestion on busy days with the mixing of Seneca College and private traffic. Due to its narrow width, aircraft taxiing in opposing directions are unable to pass easily. The sight distance for the entire taxiway length at the intersection of Apron III and Taxiway 'C' is limited.

The Seneca College Apron is used exclusively by the college's flight training program for aircraft operations and parking. Through consultation with Seneca College, it is expected that the school will continue to grow into the planning horizon. With continued fleet growth, the school will require additional apron space to support growing operations.

The Tie Down Area is surfaced with compacted recycled asphalt. This surface has experienced some localized surface settlement. To mitigate the settlement, two asphalt taxilanes were installed in the higher traffic areas. Aircraft parked on the surface often settle and occasionally experience difficulty initiating taxi operations. There are also reported issues with Foreign Object Debris (FOD) due to the presence of loose granular material on the surface.

Requirements

It is recommended that a passing area at the midpoint of Apron III be provided in the short term to facilitate aircraft movement on Apron III.

It is recommended that the Tie Down Area be maintained and reserved to accommodate future growth requirements of Seneca College.

It is recommended that a grass Tie Down Area be developed in the medium term west of the intersection of Taxiway 'C' and Apron III to account for the loss in tie down capacity resulting from the realignment of Taxiway 'C'.

It is recommended that the compacted recycled asphalt surface on the existing Tie Down Area be monitored by the airport to mitigate possible future FOD issues.

6.2.3 Air Navigation Facilities

6.2.3.1 Communications

Current Status

The current Mandatory Frequency (MF) and UNICOM service provided by the airport operator has been deemed sufficient for current operations at the Airport by NAV CANADA. The arrival of Seneca College in 2014 has led to increased local movements and has been attributed to increasing congestion.



It was noted that the current radio frequency being utilized is subject to congestion due to nearby airports utilizing the same frequency. The airport operator is currently testing different frequencies in partnership with Industry Canada to assess if any alternative frequencies would better serve the Airport. The current and future status of ATS at Peterborough Airport can be found in Section 6.2.3.5.

Requirements

No additional air-ground communication infrastructure is currently required as per NAV CANADA recommendations. Continued consultation with NAV CANADA is recommended as activity at the Airport increases.

6.2.3.2 Instrument Flight Procedures

Current Status

There are currently 3 instrument flight procedures serving Runways 09 and 27.

Runway 27 is served by a RNAV¹¹/GNSS¹² approach to a Minimum Descent Altitude (MDA) of 512 ft. AGL with minimum visibility limits of 1 ½ mile.

Runway 09 is served by an LPV¹³ approach with an MDA of 500 ft. AGL and a minimum visibility limit of 1 ¾ mile, and by an NDB approach with an MDA of 694 ft. AGL and a minimum visibility limit of 2 miles.

Issues to Address

The airport operator and numerous stakeholders have identified a desire to obtain lower MDAs for Runway 09 and 27. If Runway 09-27 were to be re-designated as a Non Precision facility, LPV approaches down to 250 ft. AGL and 1 mile visibility may be achievable.

Requirements

It is recommended that the designation of Runway 09-27 be upgraded in the short term to Non Precision to increase airport availability. Further study into the implementation of physical or operational solution(s) to obtain Non-Precision designation is currently underway.

¹¹ RNAV: A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based NAVAIDs or within the limits of the capability of self-contained aids, or a combination of these.

¹² GNSS: Global navigation satellite system (GNSS) is a worldwide position and time determination system that includes one or more satellite constellations, aircraft receivers and system integrity monitoring, alerting, augmented as necessary to support the required navigation performance for the intended operation.

¹³ LPV: A GPS based instrument approach with the precision of a localizer and vertical guidance. Can allow for approaches down to 250' above ground on a Non-Precision runway.

6.2.3.3 Surveillance

Current Status

Low-level radar surveillance is currently not provided by NAV CANADA at Peterborough Airport. However, radar coverage is available to aircraft operating above 3,500 ft. AGL.

Requirements

No additional surveillance requirements have been identified; however, should an Air Traffic Control Tower be required in the future, NAV CANADA may need to address or revisit the requirement for surveillance.

6.2.3.4 Aviation Weather

Current Status

Peterborough Airport has an Automated Weather Observation System (AWOS) providing weather information directly to pilots via automated radio broadcast and to NAV CANADA to maintain its pilot briefing services. There are currently no identified deficiencies with the AWOS in operation at Peterborough Airport

Requirements

The development of a General Aviation area south of Runway 09-27 and east of Runway 13-31 is recommended in close proximity to the AWOS station. Prior to the full development of this area, relocation of the AWOS will be required.

It is recommended that the AWOS be relocated in the medium term to allow for the expansion of the South Development Area.

6.2.3.5 Air Traffic Services (ATS)

Current Status

Air Traffic Services at Peterborough Airport are provided by a Frequency Peripheral Station (PAL), facilitating communication to Toronto Center. This is used primarily by aircraft operating under instrument flight rules.

With the relocation of Seneca College from Toronto Buttonville Airport to Peterborough Airport, local activity at the facility has increased dramatically. As a result of this influx of traffic, there have been reports of potential safety concerns arising from the increased activity. Both Seneca College and the City of Peterborough have requested a higher level of ATS at the Airport. In 2015, NAV CANADA conducted an aeronautical study to assess Peterborough Airport's eligibility for Air Traffic Control (ATC) Service. It was concluded by NAV CANADA that an Air Traffic Service at the Airport was not yet required. NAV CANADA will continue to monitor the situation at Peterborough Airport into the future and reassess the requirement for improved ATS.



Consultations with NAV CANADA have concluded that a future control tower to the south of Runway 09-27 is not desirable. In the *Peterborough Airport – Control Tower Preliminary Design* (NAV CANADA, 2014), the ideal location for a control tower facility was situated in what is now the Seneca College Apron. Alternatively, a location east of the current Air Terminal Building was identified. This alternate site has been identified in the Strategic Development Plan and reserved for this purpose.

Requirements

It is recommended that Peterborough Airport maintain contact with NAV CANADA and that land be reserved in the short term in the core area for future construction of an Air Traffic Control facility.

6.2.4 Air Terminal Building and Passenger Processing

The current Air Terminal Building (ATB) was constructed in 2010 in conjunction with other large airport capital projects including the extension of Runway 09-27. The building houses a central public waiting area, administrative offices, meeting rooms, and a restaurant comprised of a kitchen and dining room. The ATB was designed to accommodate and serve General Aviation traffic and passenger air services up to ‘commuter’ size operations utilizing 9-19 seat aircraft. The design of the building and the availability of adjacent land permits future expansion of the facility.

Issues to Address

The ATB functions well with respect to its originally intended use. However, the building is unable to accommodate large charter aircraft operations using narrow body aircraft such as the B737. Passenger processing for large aircraft charters is currently undertaken in a separate building and passengers are shuttled by bus to a remote aircraft stand. Growth in passenger charter operations is hampered by the lack of public facilities to support operations.

The current restaurant located in the ATB is reported to be overcrowded several times daily and the provision of additional space would increase usage, and revenue to the operator and to the City.

It is recommended that options to accommodate the future growth of the restaurant be investigated.

Requirements

Should the City determine that growth in leisure passenger charter services is desirable, consideration should be given to the development of a **charter terminal** which could also serve other public gathering purposes. The charter terminal could feasibly be a large open area capable of reconfiguration depending upon the type of periodic flight activities using the facility.

The facility should be sized for approximately 270 peak passengers (one arrival and one departure simultaneously) at a Level of Service D and include provision for temporary baggage and passenger security and CBSA inspection services. Portable check-in counters could be used and inbound and outbound baggage handling equipment provided. The City may consider the possibility of a Private-Public Partnership for the construction and operation of such a facility.

It is recommended that further study be undertaken to investigate charter terminal development options and financial models at Peterborough Airport in the short term.

It is recommended that land be reserved in the core area at the intersection of Aprons I and II for the development of a future charter passenger facility.

6.2.5 Access Roads and Parking

6.2.5.1 Access Roads

Peterborough Airport is accessed from Airport Road, which connects to Highway 115. The Airport's core development area including the ATB, Seneca College, and General Aviation area are accessed via Mervin Line and Skyway Drive. The core industrial area on the east side of Apron I is accessed directly from Airport Road. Airport Road is currently divided by Runway 09-27. Construction began in 2016 to realign Airport Road to the east and has since been substantially completed as Peterborough County Road 11. This realigned acts as a catalyst for development of new General Aviation areas in the south, as well as provide access to future industrial lots on the east side of Taxiway 'I'.

Issues to Address

Airport Road, south of Mervin Line, is in poor condition showing pavement degradation, rutting and cracking. Upon completion of the Airport Road realignment, it is expected that the existing airport road will be downloaded from the County of Peterborough to the City. **It is recommended that the existing section of Airport Road between Mervin Line and Runway 09-27 be rehabilitated in the short term as the surface is in noticeably poor condition.**

6.2.5.2 Public Parking

Peterborough Airport's public parking lot is currently capable of accommodating approximately 100 vehicles. This parking area is located north of the Air Terminal Building. There are several other parking areas at the Airport; however, they are privately operated by airport tenants and are not available for use by the general public. The size of the public parking lot is deemed to be sufficient for the short term. With increasing frequency of leisure charters, parking capacity could become a constraint in the medium to long term.

Seneca College's School of Aviation is currently experiencing parking shortages. Most of its students drive to the Airport for flight training. Seneca College's student parking lot located north of the public parking area and is frequently at capacity.

Requirements

It is recommended that the lands adjacent to the current public parking lot be reserved for expansion of the public parking lot in the medium term.

It is recommended that the land to the northeast of the Seneca College student parking lot be reserved in for future parking expansion by Seneca College.

It is recommended that access roads and vehicle parking be constructed to serve General Aviation and Industrial lots as they are prepared.

6.2.6 Airport Utilities and Services

To support anticipated business growth at Peterborough Airport, additional development areas will require municipal services such as potable water, fire suppression, sanitary sewers, electricity, gas and telecommunications.

6.2.6.1 Water Servicing

Potable water is supplied via a 75 mm High Density Polyethylene (HDPE) pipe from the Major Bennett Industrial Park directed through the Fire Pump Building, located adjacent to the wastewater pumping station on the west side of existing Airport Road.

Firefighting facilities at the Airport consist of a fire storage reservoir, two fire pumps, distribution piping, and fire hydrants. Water is drawn from the potable water distribution main and is isolated from the potable water system through the use of a backflow preventer.

Water servicing to support development should be adequately sized to meet the demand for potable water mains. As the Airport grows, ongoing improvements to utilities and services, and reassessment of infrastructure requirements must be undertaken.

Requirements

Water servicing is reaching its current capacity and requires improvements to meet the projected activity demand at Peterborough Airport. When servicing was first provided to the Airport in 2002, there were 150 people employed at various airport businesses. In 2017, it was determined that approximately 570 people were on site at the Airport – thus demonstrating the requirement for water and sanitary sewer capacity upgrades in the short term. **The capacity of the watermain serving the Airport should be increased in the short term.**



6.2.6.2 Sanitary Sewers

Sanitary sewage at Peterborough Airport is collected by a gravity sewer system. The sanitary sewage flows into a sanitary pump station located on the west side of Airport Road immediately north of Mel O'Brien Way. The Sanitary Pumping Station is rated for a flow of 3.1L/s which is the limit stated in the current Ministry of Environment Certificate of Approval. It is expected that there will be future sanitary demands based on the desired business direction of the Airport, which may include additional sanitary sewers as well as potential upgrades to the existing pumping station. Specific sizing of sanitary sewers and extent of upgrades to the pumping station will depend on the extent of development undertaken by the Airport.

Requirements

Similar to water servicing, the sanitary sewer forcemain is undersized to meet projected growth at Peterborough Airport. There are typically two pumps running at all times, although one was intended to be a back-up. **The capacity of the sanitary sewer forcemain serving the Airport should be increased in the short term.**

6.2.6.3 Electrical, Gas and Communications

Power to the Airport is supplied by Hydro One via a 4800 Volt overhead line located on the west side of Airport Road. When new development at the Airport occurs, the owner absorbs the infrastructure cost associated with providing electrical power and Hydro One assumes ownership and maintenance of the equipment.

The electrical power infrastructure should be sufficient to provide power to the new development areas including any airfield lighting requirements such as taxiway edge lighting for the extended parallel Taxiway 'B'. It is recommended that any additional electrical systems be designed and installed to meet ESA standards.

The Field Electrical Centre (FEC) providing power to all airfield lighting and critical electrical infrastructure which will be connected to a natural gas generator (secondary source of power) to allow for continued, long term airport operation in the event of an electrical grid failure. The FECs capacity is nearing its limit for additional airfield lighting.

Natural Gas supporting the Airport is supplied by Enbridge Gas Distribution with an existing gas main located on the west side of Airport Road. Additional infrastructure or upgrades may be required to support future gas loads.

Telecommunications including internet and phone services are provided by Nexicom and Bell Canada (Fiber Optic). These services are supplied directly to individual tenants and businesses at the Airport upon request, at the expense of the tenant.

It is recommended that all new lots be provided with site servicing (with the exception of the South Development Area).

6.2.7 Customs Services

Peterborough is currently designated by the Canadian Border Services Agency (CBSA) as an AOE/15 facility, meaning it is an Airport of Entry for aircraft carrying up to 15 passengers. However, the Airport does not host any on-site customs personnel. Currently, CBSA services for ad-hoc passenger charters and transborder/international flights are provided on a cost recovery basis and must be pre-arranged with the agency. The nearest CBSA detachment is located in Trenton, ON resulting in a typical 2-hour wait time if not pre-arranged. Customs' hours of operation are from 8:30 am to 3:30 pm, Monday to Friday, excluding holidays.

Requirements

It is recommended that Peterborough Airport continue to maintain discussions with CBSA to provide on-site customs services to support passenger charter and commercial General Aviation operations. As international and transborder charter services grow, further permanent on-site CBSA staff may be required.



7.0 COMMERCIAL INVENTORY REVIEW

7.1 Commercial Leases

The core development area at Peterborough Airport is the primary location for airside commercial development. This area is located in the north-east quadrant of the Airport where extensive development has been undertaken since 2009. There are currently many commercial leases and businesses in place at the Airport as described (alphabetically) below.

- ▶ **Aerotrike Aviation** is flight training operation specializing in fabric flex wing ultralight training. The operation also provides ultralight ground school courses and radio operator training and certification.
- ▶ **Airtech Canada (JCM Aerodesign)** specializes in custom modifications for special purpose fixed wing and rotary wing aircraft. As such, they provide engineering, manufacturing and Transport Canada approvals in house. Some of these modifications include aero-medical modifications and completions, de Havilland DHC-3 “Otter” radial conversions and modifications for agricultural, survey and cargo aircraft.
- ▶ **Amer and Associates** provides economic development consulting services.
- ▶ **Carlson Wagonlit Travel (Stewart Tours)** is a travel agency which organizes public leisure destination charters using Boeing 737-400 type aircraft. They operate a satellite office at Peterborough Airport and organize the logistics and services supporting the sale and operation of these tours.
- ▶ **Complete Aviation Services** provides aviation fuel sales, fixed based operator services for General Aviation, passenger charter flights, customer service to itinerant aircraft and aircraft ground support. Complete Aviation Services also provides a pilot’s lounge and small aircraft hangar to accommodate itinerant aircraft.
- ▶ **Curtiss-Wright (INDAL Technologies)** is a designer and supplier of advanced electro-mechanical systems used aboard ships and helicopters for many of the world’s navies. The company has established an engineering/design office at the Peterborough Airport specializing in R&D programs.
- ▶ **Flying Colours Corporation** is an aircraft completions business and heavy aircraft maintenance and overhaul centre. They provide authorized service facilities for both Bombardier and Beechcraft and specialize in modifications for Bombardier Challenger, Regional Jet, Global Express and Falcon 900-type aircraft as well as other types as required. Flying Colours Corporation is the airport’s anchor tenant.
- ▶ **Kadex Aero Supply** offers nation-wide sales and servicing of aircraft components, parts and consumables, and supply chain support. The business focuses primarily on Beechcraft, Cessna and Piper piston, turbo prop and jet aircraft types. Kadex operates a second service centre in Calgary, Alberta



- ▶ **Gardens & Fields** is the operator of a restaurant located in the main terminal building.
- ▶ **Legendary Coaching** provides professional mediation, negotiation and facilitation services.
- ▶ **The Loomex Group** operates the Peterborough Airport under contract from the City. They also offer specialized emergency response training, property management, airport management and marketing services.
- ▶ **Peak Benefits** specializes in group benefits and retirement insurance.
- ▶ **President Air Charter** is a small charter carrier operating a Beechcraft Super King Air 300 aircraft.
- ▶ **Seneca College School of Aviation & Flight Technology** trains pilots from ab initio to commercial airline standards for the global aviation industry. The school conducts its Bachelor of Aviation Technology curriculum at its Peterborough Airport Campus. Seneca College's aircraft fleet consists of 12 Cessna 172s, 4 Beechcraft Bonanzas and 3 Beechcraft Baron aircraft. The school has a number of flight training devices including desktop procedure trainers, various single and multi-engine devices, and a sophisticated CRJ200 Regional Jet trainer with a full external vision system.
- ▶ **Toronto Avionics Ltd** is a Transport Canada approved avionics sales and service centre specializing in the repair, installation and overhaul of aircraft avionics systems.
- ▶ **Vector Air Ltd** provides executive aircraft charter services using a Cessna C550 aircraft. Clients include government officials, business executives and corporate management teams. Vector Air also operates a Cessna C172, which is rented to student pilots seeking additional flight time.
- ▶ **W.M. Aeroflight** provides flight training services for recreational and private pilot's licenses in addition to night, instrument and multiengine ratings. W.M. Aeroservice conducts light aircraft maintenance and repair on both local and itinerant aircraft.

7.2 Commercial Land Sectors

Airport commercial land at Peterborough Airport is classified as:

- ▶ Aviation Industrial;
- ▶ General Aviation; and
- ▶ Groundside Commercial

The aforementioned land sectors are analyzed and described in the following sections.



7.2.1 Aviation Industrial

7.2.1.1 Airport Industrial

The Airport Industrial category includes businesses that offer the following services:

- ▶ Aircraft painting;
- ▶ Aircraft interior finishing;
- ▶ Aircraft component manufacturing;
- ▶ Avionics installations, certification, repair and overhaul;
- ▶ Aircraft composites manufacturing; and
- ▶ Other related services

This list is not all encompassing of industrial activity that occurs in the aerospace industry; however, the current activity at Peterborough Airport is well represented by the services described above. Peterborough Airport has frequently been called a “working airport” due to its industrial nature and focus on job creation. Peterborough Airport’s industrial businesses are primarily surrounding Apron I and to the east of Airport Road along Taxiway ‘I’. These areas are identified to be sufficient for the current rate of lot uptake for airport industrial businesses throughout all planning horizons.



Aircraft Painting at Flying Colours Corporation

7.2.1.2 Aircraft Maintenance

Aircraft maintenance activities are currently being undertaken at Peterborough Airport. These activities support other airport tenants as well as attract business and customers from other airports. Aircraft maintenance organizations undertake some, all, or a combination of the following activities:

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- ▶ Maintenance, Repair and Overhaul (MRO) including passenger aircraft, corporate aircraft and General Aviation aircraft;
- ▶ Engine overhaul (piston, turboprop and turbine);
- ▶ General Aviation aircraft inspections, routine maintenance and ad-hoc repairs; and
- ▶ Airframe overhaul.

The City of Peterborough has always been supportive of the expansion of the aircraft maintenance sector. Existing aircraft maintenance organizations have been expanding and are expected to continue to grow in the future.

Sufficient land area has been identified surrounding Apron I and Taxiway 'I' to support the expected growth in Airport Industrial land demands, with the majority of lands being suitable for supporting MRO and other facilities.



Flying Colours Corporation Aircraft Parked on Apron II

7.2.2 General Aviation

General Aviation activity makes up the majority of aircraft movement activity at Peterborough Airport. General Aviation activity is undertaken by individuals, organizations, and businesses. The following services are examples of General Aviation activities:

- ▶ Public charter flights (e.g. Stewart Tours);
- ▶ Private Air Charter (North America);
- ▶ Personal or business aircraft use;
- ▶ Flight training and education;
- ▶ Support activities for the above activities including aircraft sales, repairs, inspection and parts;
- ▶ Sales of fuel (100LL and Jet A) and other consumables such as oil and fluids;
- ▶ Hangar space for General Aviation operators; and



- Medevac and Law enforcement services.

Seneca College's Aviation program generates considerable traffic at the airport and is expected to grow. The General Aviation area along Apron III is nearing capacity, with space for an additional 4 small sized hangars. Additional capacity for development of General Aviation hangars should be provided in the short to medium term.

7.2.2.1 Business and Corporate Aviation

Business aviation primarily involves the transportation of executives or employees of a company, in a timely manner. The aircraft used in business aviation can either be owned individually, by a corporation, or through fractional ownership. Business aviation activities are currently occurring at Peterborough Airport.

In the 2009 Master Plan, it was suggested that a combined ATB/FBO facility be constructed for these types of activities. While the terminal building was constructed, it caters to smaller General Aviation users and lacks the amenities required by most high end business travelers.

Peterborough Airport currently does not have the ability to process high end corporate traffic. There is no publically available hangar space to house transient aircraft. The current FBO operator provides adequate ground support but not all services are currently being provided to their full potential. An FBO capable of handling large corporate aircraft such as the Bombardier Challenger 604 and Global Express type aircraft should be considered in the short term. There are currently 4 lots available for large corporate aviation operations. Large corporate operations include:

- Corporate and executive aircraft charter;
- Large private aircraft hangar; and
- Corporate flight headquarters.

The Strategic Development Plan includes provisions for large scale corporate aviation operations in the West Development Area, north of the future Taxiway 'B' extension.

7.2.2.2 Flight Training

Peterborough Airport is an established flight training airport. WM Aeroflight offers flight training at the recreational and private pilot levels. They have 3 C172, 1 C152 and 1 PA23 type aircraft. Aerotrike Aviation offers specialized flex wing ultralight trike flight training. In 2014, Peterborough Airport successfully attracted Seneca College's Aviation program. This flight training program generates considerable traffic at the Airport. The majority of aircraft movements are, in fact, from Seneca College's operations. Seneca College is expected to continue to expand in the upcoming years.





Seneca College School of Aviation

7.2.2.3 Recreational

There are currently many recreational aircraft operators at Peterborough Airport. The recreational category also includes experimental, homebuilt, and ultralight aircraft. Currently, the majority of these operators are located in private hangars along Apron III and on the Tie Down Area. Future development areas for recreational operators have been identified along Apron III and within the new South Development Area along Taxiway 'F'.

7.2.2.4 Natural Resource and Government

Flight operations related to natural resource and government activities typically include firefighting, medevac, law enforcement, executive transport and other government functions. Area is provided within the Strategic Development Plan along the future section of Taxiway 'B' for this purpose. In addition, the development of a national defence operation is accommodated in the Plan as per the Private Airside Development Reserve on the western sector of the airport. This reserve is intended to provide a segregated location as the nature of these types of operations is typically sensitive and occasionally requires enhanced security measures.

7.3 Airside Commercial Land

Airside commercial land leases provide businesses and individuals with access to the airport's infrastructure. Lot uptake rates are based on historical precedence and current market conditions. Ultimately the development of commercial areas are often event driven and may not always adhere to the specific planning horizons described in the following sections.



7.3.1 Industrial

Demand

Industrial demand is difficult to predict. The attraction of an industrial business is done through an extensive marketing program conducted by Peterborough Airport. A strong marketing campaign does not necessarily guarantee the attraction of new tenants. Since the Business Case in 2008, no new industrial tenants have been attracted to the Airport.

However, Flying Colours Corporation has undergone significant growth and has acquired and developed 2 industrial lots on the east side of Apron I. It is expected that some demand for new industrial lots will be attributed to the expansion of current airport businesses. For example, the first four lots that are being constructed as part of the initial phase of the Taxiway 'I' project are expected to be leased and occupied by an existing tenant in the short term. It is expected that the lot absorption rate will be approximately 1 lot every 2 years for industrial development.

Supply

There are currently 7 large industrial lots along Apron I that are available for development in the immediate term. These lots are within the core development area on the west side of Apron I. These industrial lots are expected to be sufficient for industrial demand for the short and medium term. In the short term, an additional 4 industrial lots will become available as part of the east development area along Taxiway 'I'. In the medium term, an additional 8 industrial lots are planned along Taxiway 'I'. Ultimately as required, an additional 12 industrial lots are planned for the east development area to the east of Taxiway 'I'. These lots would be accessed by the realigned Airport Road.

7.3.2 General Aviation

Demand

Demand for development land at Peterborough Airport has been strong since the completion of the Business Case for Infrastructure Development (LPS AVIA, 2008). Demand for General Aviation land has been particularly strong. Since 2009, 19 new lease areas were developed into small to medium sized private hangars along Apron III. The large lease area that was formerly the Kawartha Lakes Flight Training Hangar was developed into the Seneca College School of Aviation. Seneca College is expected to expand and will likely require additional land leases. With the impending closure of Buttonville Airport, it is expected that demand for General Aviation lots will remain strong. The Airport is actively pursuing these tenants and it is expected that the annual absorption rate will be approximately 3 small General Aviation lots per year.

Peterborough Airport's 7,000 ft. runway and other aviation facilities, as well as its geographic location east of the GTA, give it a strategic advantage for large corporate aircraft.



It may be possible to attract an individual or a business that operates large corporate aircraft to Peterborough Airport. Lands for such an operation are planned for development along the extended Taxiway 'B' in the West Development Area. With the anticipated elimination of corporate General Aviation from Toronto Pearson Airport, it is expected that demand for lots to develop large General Aviation operations will increase. It is expected that the annual uptake rate for leases of large General Aviation lots will be 1 lot for every 2 years.

Supply

General Aviation has rapidly expanded at the Peterborough Airport. There are currently only 4 small hangar leases available in the immediate term. In the short term, an additional 8 small hangar lease areas will be available along with 2 medium to large leases available on Apron III. Given the predicted lease uptake rate of 3 per year for small General Aviation hangars, it is expected that this additional development land will be sufficient for the short term only. In the short term, the South Development Area will provide sufficient area for two T-hangar buildings (16 aircraft bays) without requiring the relocation of the AWOS.

Ultimately, the South Development Area will be capable of supporting 5 T-hangars with space to accommodate 48 aircraft. The construction of T-Hangars will maximize land use in the South Development Area and will require minimal investment. The realignment of Airport Road was completed in the summer of 2017, further supporting the usability of this area. The addition of T-hangar buildings is expected to reduce demand for tie down spaces in the Tie Down Area. This would allow for future Apron expansion for Seneca College and the potential realignment of Taxiway 'C'.

Large General Aviation lots for corporate operations are currently not available at Peterborough Airport. In the short to medium term, lots along the extended Taxiway 'B' in the West Development Area should be established. In total, 9 large General Aviation lots could be provided. It is predicted that a lot uptake rate of 1 lot every two years for large General Aviation operators will apply. The large General Aviation lots along Taxiway 'B' are expected to meet the anticipated growth in that sector throughout the planning horizons identified herein.

7.4 Groundside Commercial Land

Groundside commercial land is provided for businesses who do not require direct access to the airfield. These businesses often establish at airports to provide support to aviation businesses or users of the airport.

Demand

Demand for groundside commercial land is difficult to measure. There is far more competition for groundside commercial lands within the City, as businesses that do not require airside access need not establish at the airport.

It is expected that the overall demand for non-aviation related commercial land will increase as the aerospace industrial park increases in size. Although not occupying their own lease areas, a number of businesses have moved to the Peterborough Airport to support aviation operations. For example, Peak Benefit Solutions, Amer & Associates, and Gardens and Fields restaurant have established themselves to support other airport businesses and operations. The lease uptake rate may not be representative of groundside commercial performance as multiple organizations can be present on a single lease. If demand for groundside commercial lands performs beyond expectations, additional property could be provided outside of current airport boundaries. The lands north of Mervin Line are currently vacant, and they are outside of the Otonabee River and Cavan Creek floodplain. Being outside of the floodplain and environmentally sensitive areas could facilitate development approvals.

Supply

The Strategic Development Plan identifies one area for groundside commercial land development opportunities. Located within the core development area, west of Skyway Drive, a total of 3 groundside lots are available for lease. These lots are fully serviced and have excellent visibility from Skyway Drive. These lots are expected to be sufficient for the planning horizon. As stated previously, multiple businesses may occupy single lots at a time, making lot uptake rates difficult to predict. Should additional land be required for groundside use, it is recommended that land outside of the current Airport boundary be acquired north of Mervin Line.

7.5 Development Strategy

The development strategy is based on providing adequately serviced lots to potential airport tenants as demand occurs. Increasing aviation industrial and General Aviation activities seen over the past 7 years at Peterborough Airport indicate that developments are ongoing and expected to continue throughout the planning horizon and beyond.

It is important to note that if demand outperforms forecasted lot uptake, additional lands may have to be developed earlier than anticipated. As seen west of Apron III, the majority of lots were absorbed in the short and medium terms identified in the 2009 Master Plan, which has prompted further development of the General Aviation area. Conversely, if demand is lower than expected, developments should be undertaken in a later term.

8.0 STRATEGIC DEVELOPMENT PLAN

Based on the preceding research, analysis and findings, and considering the objective to provide the greatest opportunities for long-term, sustainable job growth, the following airport development strategy is recommended:

- ▶ Expansion of existing Aviation Industrial activity, and recruitment of new aviation industrial organizations to the Airport.
- ▶ Expansion of General Aviation facilities and services including corporate aircraft hangar facilities, private aircraft storage facilities; and upgraded FBO facilities and services.
- ▶ Expansion of leisure Charter Air Services at the Airport through provision of purpose-built facilities and services.

8.1 Phased Strategy

The Strategic Development Concept presented in this Plan for the short, medium and long term planning horizons is expected to meet forecast demand and address operational deficiencies at the airport. The Phased Strategy presented herein has been structured to respond to industry demand for development areas, operational facilities, etc. The Strategic Development Plan also ensures that sufficient land leases are available to fulfill the needs of the Airport Industrial, General Aviation, and groundside commercial sectors. The recommended phased development program is summarized in Table 8.1. The Airport Strategic Development Plan is illustrated in Figure 8.1.

The Recommended Phased Development Strategy for Peterborough Airport is presented in Table 8.1 and has been prepared with respect to the respective development horizons of the Strategic Plan (short term, medium term and long term).



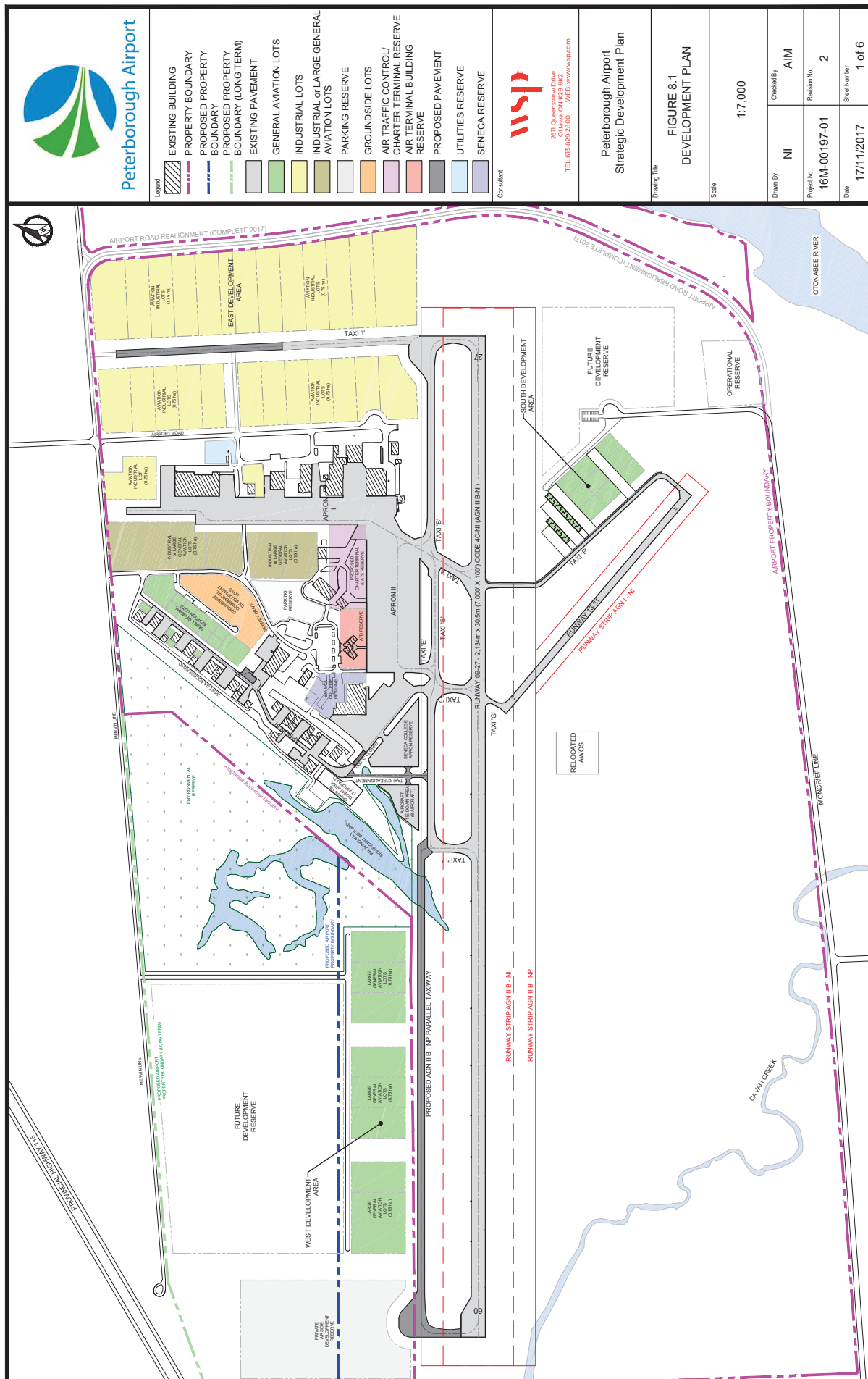
Table 8.1 – Phased Development Program

Year	Airside	Groundside	ATB and Other
Short Term (2018 – 2022)	<ul style="list-style-type: none"> ▶ Acquire Land to Facilitate West Extension of Taxiway 'B' ▶ Extend Taxiway 'B' to Runway 09 Threshold ▶ Construct Passing Area on Apron III ▶ Upgrade Designation of Runway 09-27 Non-Precision (subject to findings of Non-Precision Operations Study) Remove the Temporary Runway 27 Threshold Displacement (including tree clearing and new Instrument Flight Procedures) 	<ul style="list-style-type: none"> ▶ Prepare General Aviation Lots East of Apron III ▶ Prepare General Aviation Lot for T-Hangar Development in South Development Area ▶ Construct Access Road and Parking to Serve Small General Aviation Lots East of Apron III ▶ Construct Access Road to Serve T-Hangars in South Development Area ▶ Rehabilitate Airport Road (Between Mervin Line and Runway 09-27) ▶ Servicing Upgrades – Watermain and Sanitary Forcemain 	<ul style="list-style-type: none"> ▶ Continue Non-Precision Operations Study ▶ Commission Charter Terminal Development Options Study ▶ Initiate Environmental Assessment for Short and Medium Term Developments ▶ Reserve Land for Future Charter and/or ATC Facilities



Medium Term (2023 – 2028)	<ul style="list-style-type: none"> ▶ Realign Taxiway ‘C’ ▶ Widen Taxiway ‘F’ to 10.5m (AGN II) ▶ Establish Grass Tie Down Area ▶ Extend Taxiway ‘I’ 	<ul style="list-style-type: none"> ▶ Prepare General Aviation lots in South Development Area ▶ Prepare General Aviation lots in West Development Area ▶ Construct New Access Road to serve West Development Area ▶ Service West Development Area ▶ Prepare Industrial Lots West of Taxiway ‘I’ ▶ Expand Public Parking Lot 	<ul style="list-style-type: none"> ▶ Relocate AWOS (including hydro, road and telecom) ▶ Update Forecasts ▶ Commission Master Plan Update
Long Term (2028 – 2038)		<ul style="list-style-type: none"> ▶ Prepare Industrial Lots east of Taxiway ‘I’ ▶ Service Industrial Lots east of Taxiway ‘I’ 	





8.2 Development Plan Update

Development is recommended in phases to support current traffic levels as well as forecast growth. Improvements in airside infrastructure and commercial leases are phased based on projected activity levels and identified deficiencies. Recommended groundside infrastructure such as access roads, development lots and parking areas are phased to support airside and commercial demands. The phased development program in Table 8.1 identifies airside, groundside and other developments within the defined planning horizons. These developments are also illustrated in phased development drawings in Figures 8.2 and 8.3. The phased development of the South Development Area is presented in Figures 8.4 and 8.5. The recommended plan for airside, groundside and other airport infrastructure is based on best practices and recognized airport planning principals.

8.3 Land Use Plan Update

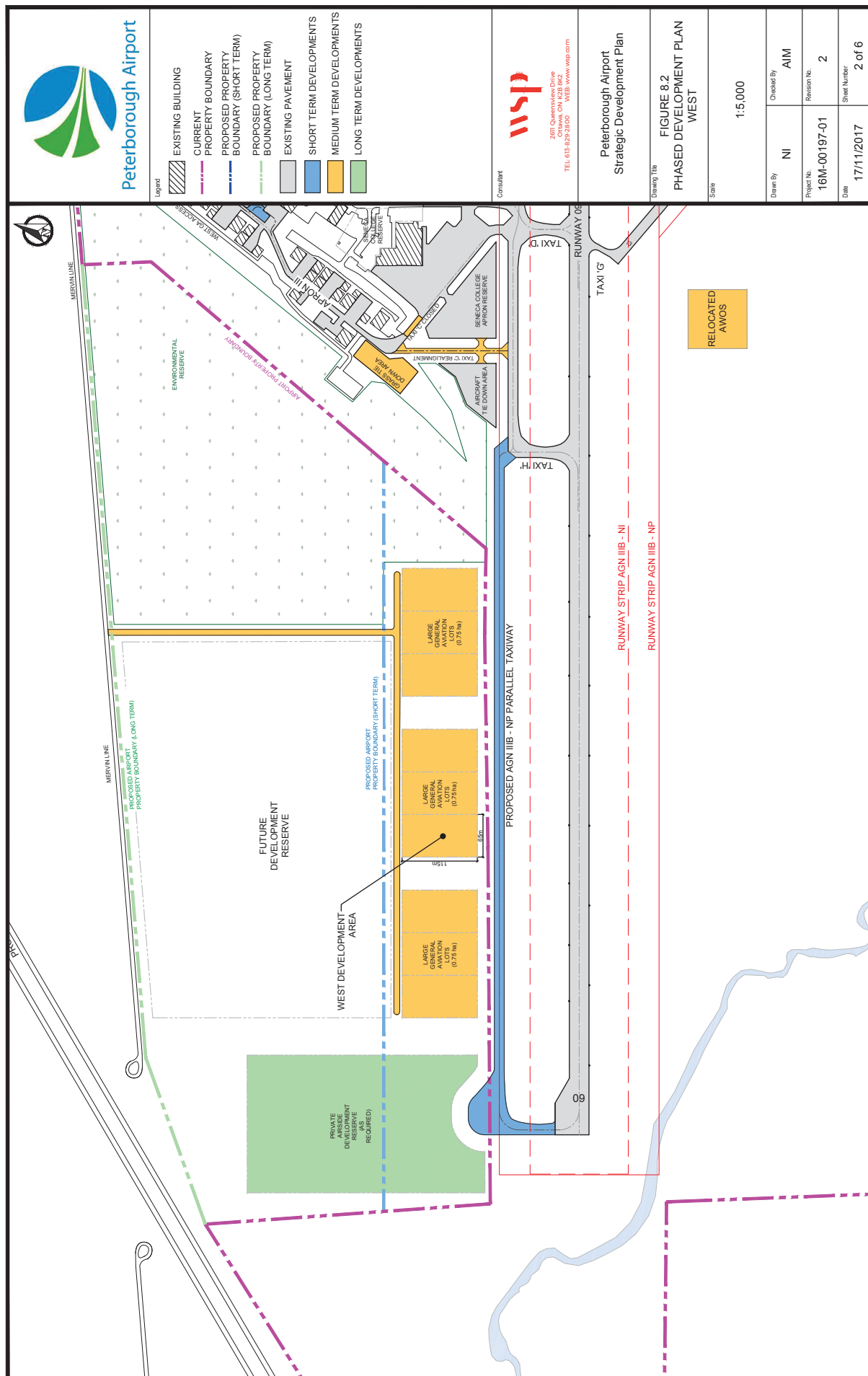
The Land Use Plan update is intended to ensure the land available at Peterborough Airport is utilized in the most efficient manner. The updated Land Use Plan is similar to that produced as part of the 2009 Airport Master Plan.

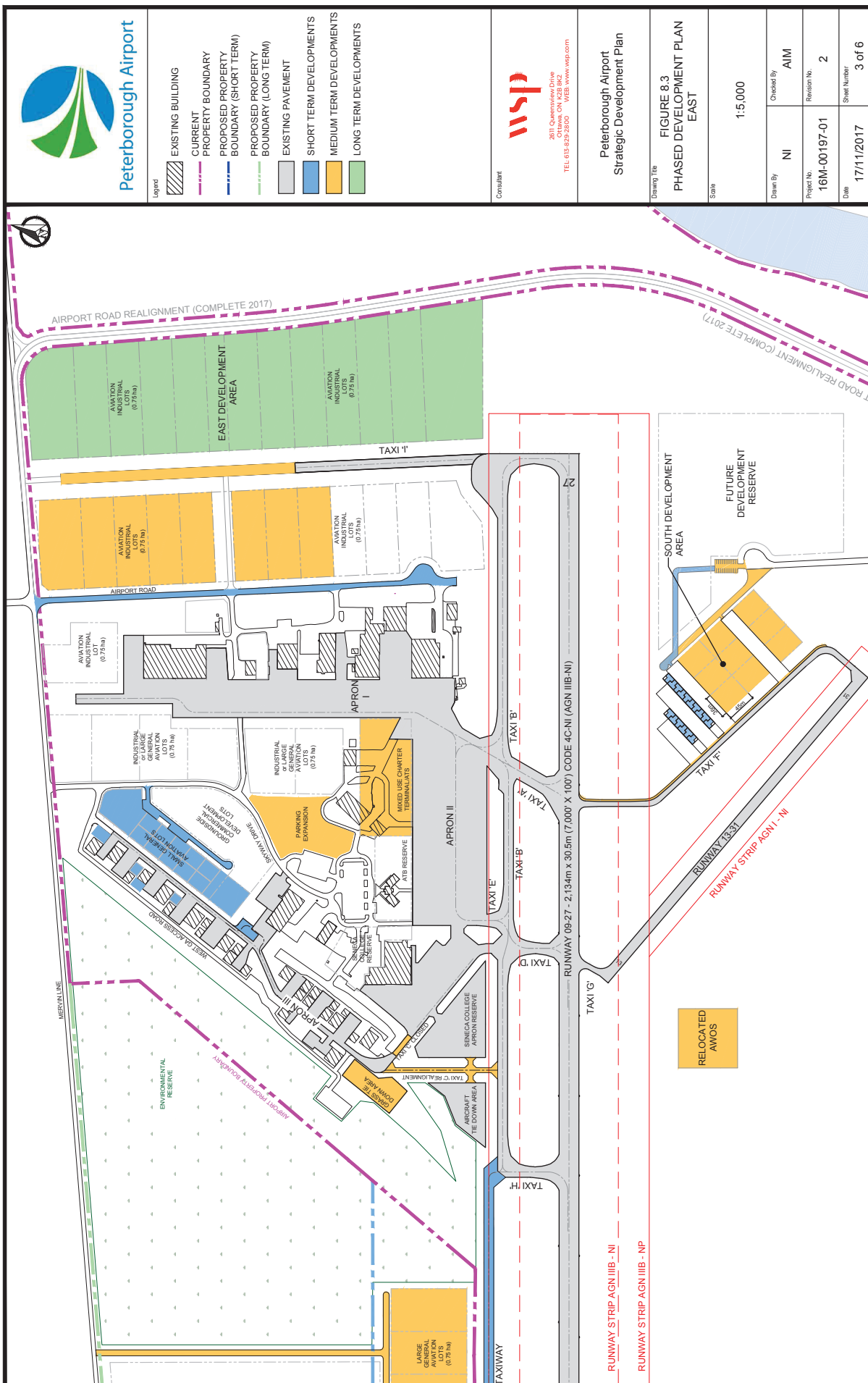
The plan presented in this Strategic Development Plan is based on a systematic land assignment for various Airport and landside facilities as follows:

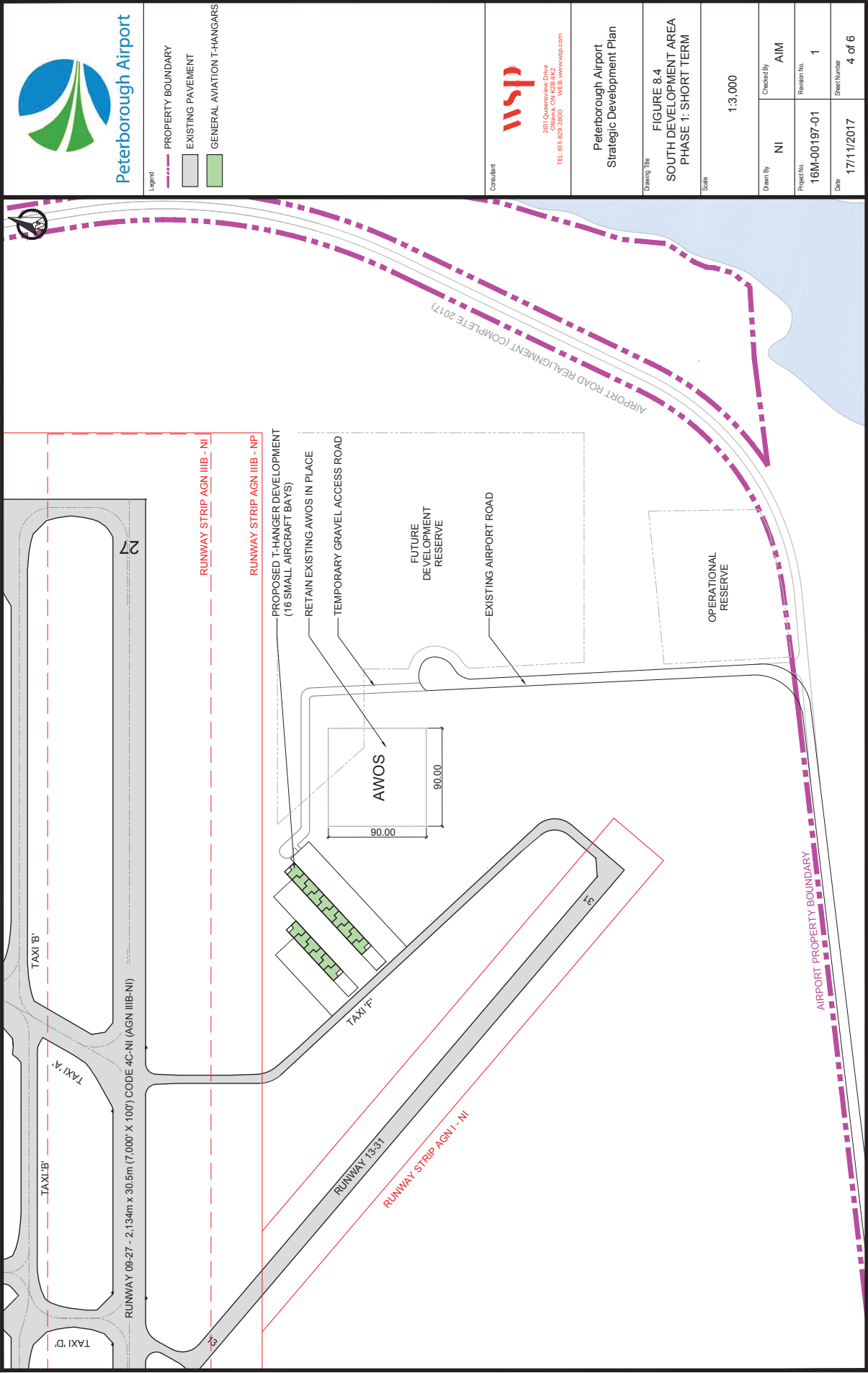
- ▶ **Airfield:** Fixed and rotary wing manoeuvring areas, taxiways, aprons and navigational aids.
- ▶ **Air Terminal and Operations:** Air Terminal Building, maintenance facilities, fueling facilities, utilities, public facilities and public parking.
- ▶ **Airside Commercial:** Airside business area, facilitating General Aviation and industrial aviation support activities that require access to the airfield; examples include MRO, flight schools, corporate aviation hangars, and private lease areas.
- ▶ **Groundside Commercial:** Business area that does not require direct access to the airfield.
- ▶ **Environmental Reserve:** Lands designated as sensitive to development due to natural concerns, particularly the preservation of wetlands and floodplains.

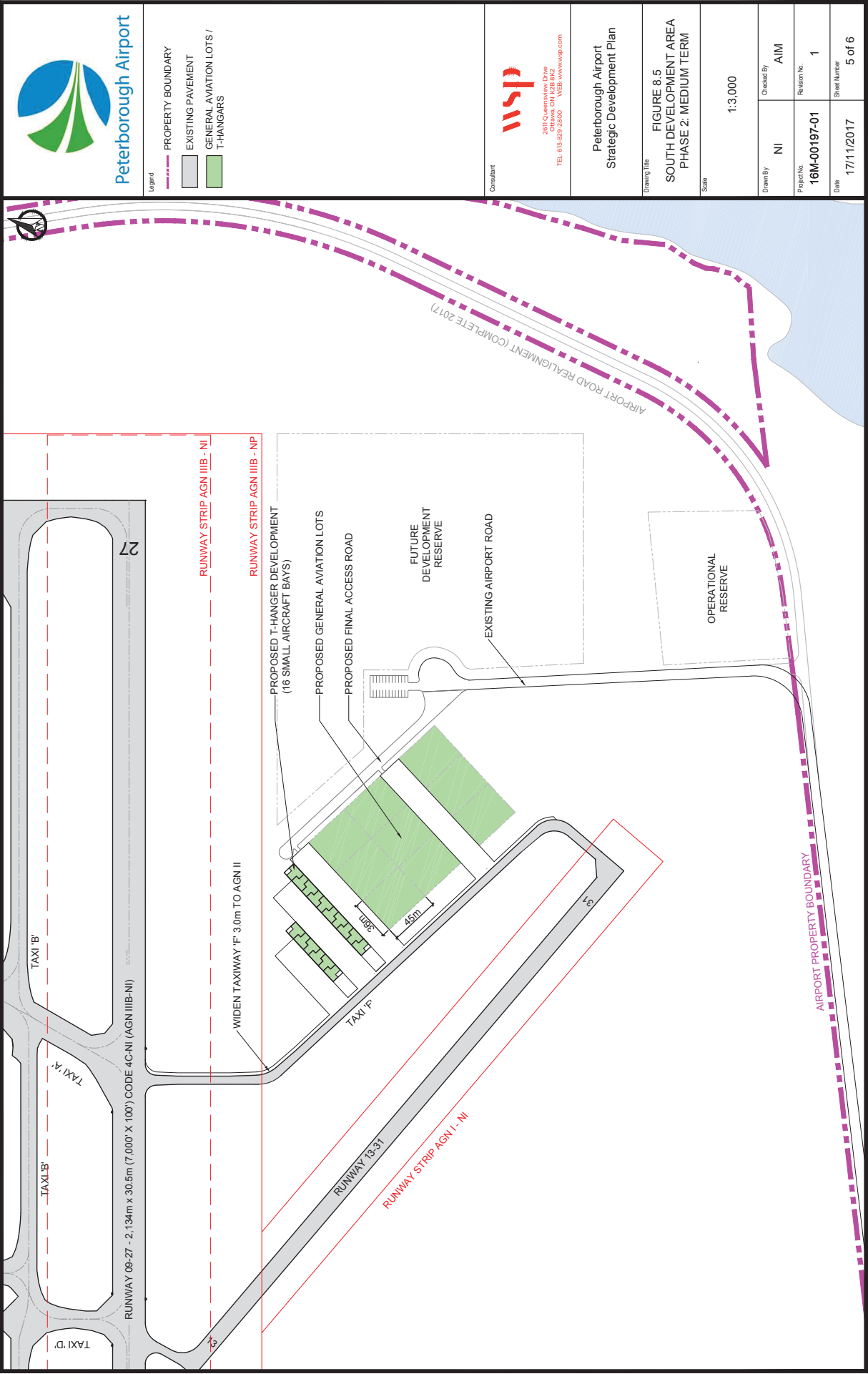
The updated recommended Land Use Plan for Peterborough Airport is illustrated in Figure 8.6.

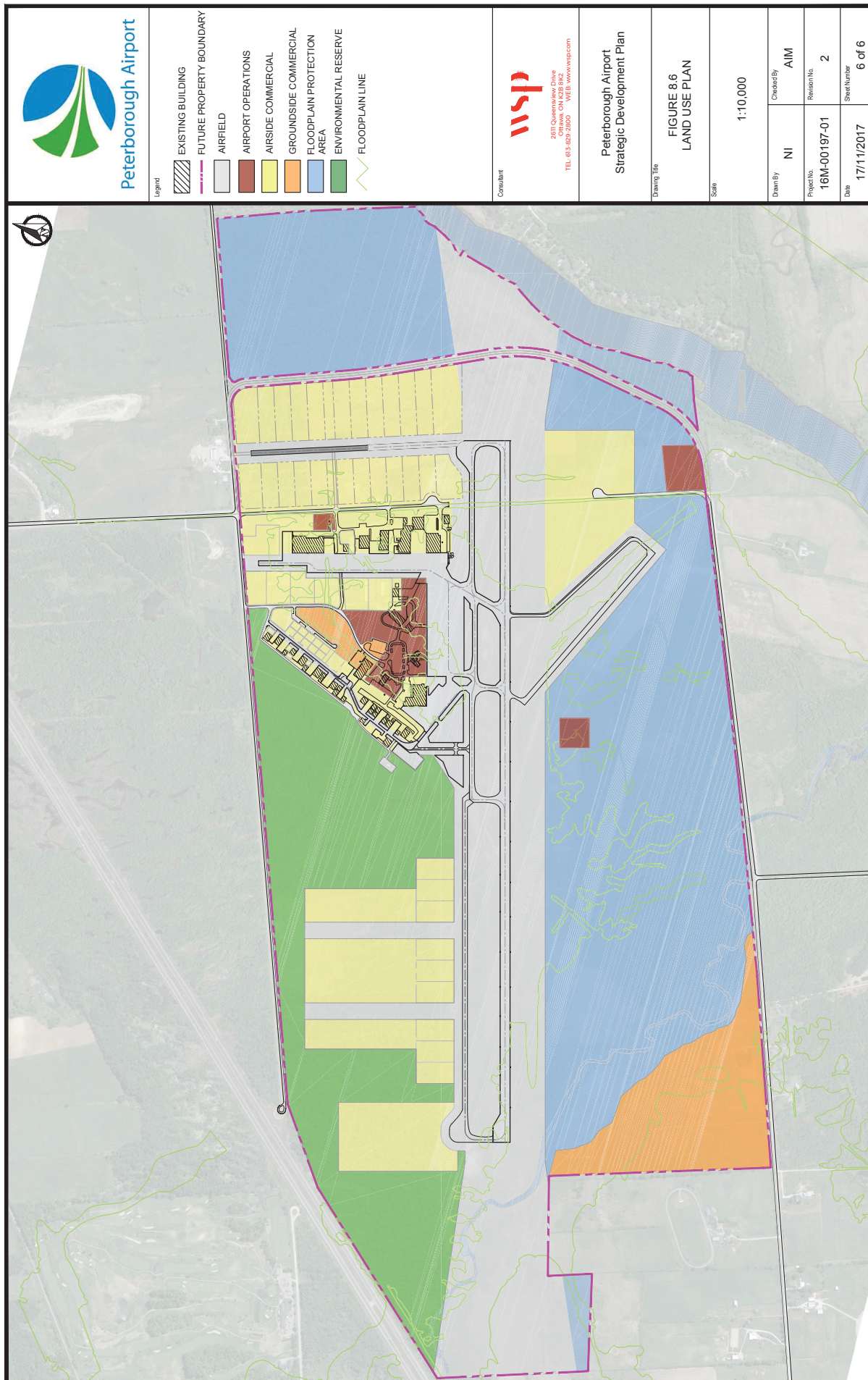












- Legend
- EXISTING BUILDING
 - FUTURE PROPERTY BOUNDARY
 - AIRFIELD
 - AIRPORT OPERATIONS
 - AIRSIDE COMMERCIAL
 - GROUNDSIDE COMMERCIAL
 - FLOODPLAIN PROTECTION AREA
 - ENVIRONMENTAL RESERVE
 - FLOODPLAIN LINE

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Peterborough Airport
 Strategic Development Plan

Drawing Title

FIGURE 8.6
 LAND USE PLAN

Scale

1:10,000

Drawn By

NI

Checked By

AIM

Project No.

16M-00197-01

Revision No.

2

Date

17/11/2017

Sheet Number

6 of 6

9.0 COST ESTIMATE

A Class 'D' cost estimate has been prepared to provide a reasonable allocation of construction costs to support the Strategic Development Plan. Costs have been separated into short, medium and long term planning horizons. The cost estimates provided in Table 9.1 are not a prediction of lowest bid, and assume competitive bidding for every portion of the project. WSP does not have control over cost and materials, the potential contractor's method of establishing prices, or market conditions prevailing when tenders may be issued for this project. WSP cannot guarantee that any received proposals, bids or actual construction costs will not vary from this or subsequent cost estimates.

Table 9.1 – Cost Estimates

Phased Development	Cost
Short Term Developments	
Airside Developments	
Extend Taxiway 'B' to Runway 09 Threshold	\$3,370,000
Construct Passing Area on Apron III	\$60,000
Upgrade Designation of Runway 09-27 to Non-Precision	Cost subject to findings of Non-Precision Operations Study
Remove Temporary Runway 27 Threshold Displacement (including tree clearing and new IFPs)	\$100,000
Groundside Developments	
Prepare General Aviation Lots East of Apron III	\$700,000
Prepare General Aviation Lot for T-Hangar Development in South Development Area	\$360,000
Construct Access Road and Parking to Serve Small General Aviation Lots East of Apron III	\$20,000
Construct Access Road to Serve T-Hangars in South Development Area	\$30,000
Rehabilitate Airport Road (Between Mervin Line and Runway 09-27)	\$180,000
Servicing Upgrades – Watermain and Sanitary Forcemain	\$5,000,000
ATB and Other	
Continue Non-Precision Operations Study	\$60,000
Commission Charter Terminal Development Study	\$50,000
Initiate Environmental Assessment for Short and Medium Term Developments	\$50,000
Subtotal	\$9,980,000
Engineering Design and Contract Administration	\$998,000
Contingency 15%	\$1,497,000



Phased Development	Cost
Total Estimated Cost of Work – Short Term	\$12,475,000
Medium Term Developments	
Airside Developments	
Realign Taxiway 'C'	\$250,000
Widen Taxiway 'F' to 10.5m (AGN II)	\$620,000
Establish Grass Tie-Down Area	\$70,000
Extend Taxiway 'I'	\$540,000
Groundside Developments	
Prepare General Aviation lots in South Development Area	\$720,000
Prepare General Aviation lots in West Development Area	\$3,910,000
Construct New Access Road to serve West Development Area	\$120,000
Service West Development Area	\$2,200,000
Prepare Industrial Lots West of Taxiway 'I'	\$6,400,000
Expand Public Parking Lot	\$150,000
ATB and Other	
Relocate AWOS (including hydro, road and telecom)	\$500,000
Update Forecasts	\$30,000
Commission Master Plan Update	\$130,000
Subtotal	\$15,640,000
Engineering Design and Contract Administration	\$1,564,000
Contingency 20%	\$3,128,000
Total Estimated Cost of Work – Medium Term	\$20,332,000
Long Term Developments	
Groundside Developments	
Prepare Industrial Lots east of Taxiway 'I'	\$9,970,000
Service Industrial Lots east of Taxiway 'I'	\$940,000
Subtotal	\$10,910,000
Engineering Design and Contract Administration	\$1,091,000
Contingency 25%	\$2,727,500
Total Estimated Cost of Work – Long Term	\$14,728,500
Total Estimated Cost of Work (All Terms)²	\$47,535,500

¹ Assumes typical resurfacing. Geotechnical investigation required to confirm extent of work.

² Cost estimates do not include: service connections for all lots, power lines, natural gas services, communications, street lights, or land acquisition.



APPENDIX A – STAKEHOLDER QUESTIONNAIRE

Business Consultation Guide
Peterborough Airport Strategic Development Plan and Economic Impact Study

Business Name:	Address:
Date:	Participants: 1.
Time:	2.
Interviewer: 1.	3.

PART A - Business Data

We would appreciate obtaining data for a full year. Please use the 2015 calendar year, your most recent fiscal year, or any other period, whichever is most convenient.

1. Business Name:

2. Respondent Name:

3. Number of Employees (on Site at Airport):

4. Number of Employees (offsite):

5. Approximate Annual Wage Bill:

6. Capital Value of expenditures made over last three (3) years:

- Proportion of these expenditures made within the Peterborough Region:

7. Average annual expenditure on goods and services (excluding salaries, benefits & Capital expenditures):

- Proportion of these expenditures made within the Peterborough Region:

8. Annual municipal taxes:

9. The City of Peterborough is proposing to invest to improve the facilities at the Peterborough airport. How would these investments affect your operations in terms of:

- Full-time employees
- Payroll – salaries and benefits
- Local on-airport purchases of goods and services
- Local off-airport purchases of goods and services
- Capital expenditures
- Municipal Taxes

PART B - General Questionnaire

The team of consultants would greatly appreciate 30 minutes of your time to discuss the economic impact questionnaire and to develop a better understanding of your business. This information will help the team provide the Airport with the best recommendations to proceed with future airport improvement projects. The following questionnaire lists the areas of greatest immediate interest. If you wish to participate, you can either complete the form or return it to us, or we could complete it when we meet.

Table 1 - General Business Questions

No.	Question
1	What is your primary service as a business?
2	How long has your business been at the airport?
3	What were your reasons for choosing to locate in the Peterborough Region?
4	What were your reasons for choosing to locate at the Peterborough Airport?

5	Has your business been expanding? Down-sizing? What are your expectations for the next 2 years?
6	Is your growth/decline in business related levels of aircraft movements or passenger enplanements/deplanements?
7	Are your facilities at capacity at present?

8	What are some of the factors that might influence your decision to expand at Peterborough?
9	Are there infrastructure improvements that could be made that would assist your business?
10	Do you depend heavily on supplies/customers who are within the Peterborough Region?
11	What might the City of Peterborough do at the Peterborough airport to better meet your land development needs? How much additional space do you foresee yourself needing?

12	What additional infrastructure, facilities or services on site are needed in your opinion?
----	---

APPENDIX B – STAKEHOLDER CONSULTATIONS

STAKEHOLDER CONSULTATIONS

Airport Stakeholders

The Peterborough Airport strategic development planning process included a consultation program to gather economic data, including full time and part time employee counts as well as expenditures made within the Peterborough region. The opportunity to meet with stakeholders allowed for discussion concerning the opinions, concerns, requirements and issues considered key to development by stakeholders. Stakeholders contacted included, but were not limited to the City of Peterborough, airport businesses, private airport tenants, and off-airport aerospace businesses. A list of stakeholders contacted for input into the Airport Strategic Development Plan is provided below:

- ▶ City of Peterborough
- ▶ The Loomex Group
- ▶ Vector Air Ltd
- ▶ Seneca College
- ▶ Flying Colours Corporation
- ▶ Stewart Travel Services
- ▶ Kadex Aero Supply
- ▶ W.M. Aeroflight Inc.
- ▶ Aerotrike Aviation
- ▶ Safran Electronics
- ▶ Gardens and Fields Restaurant
- ▶ Amer and Associates
- ▶ Complete Aviation Services Ltd.
- ▶ Airtech Canada Aviation Services Ltd.
- ▶ General Aviation Representatives and Operators

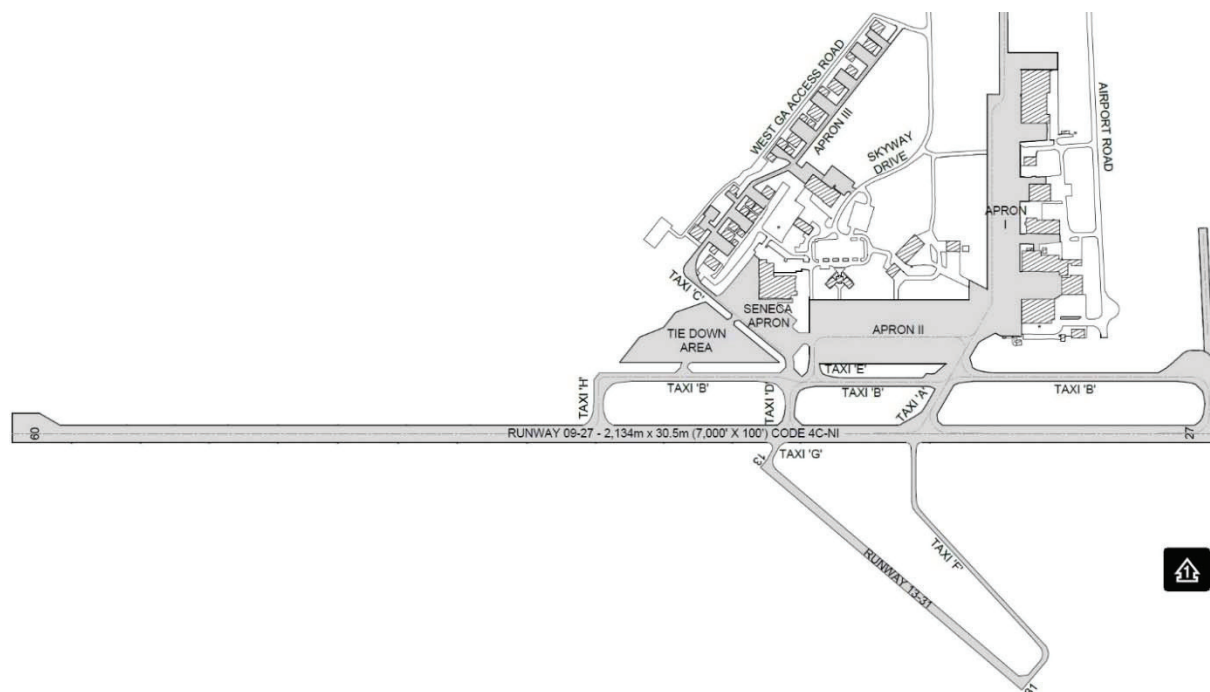
The project team conducted consultations in person and by telephone. Consultations conducted in person provided insight into the daily operations of airport businesses and allowed for the assessment of potential operational restrictions as well as the needs of each business.

Two open-house sessions were held at the airport on consecutive evenings to allow private aircraft owners and others who own or rent hangars at Peterborough Airport, to share their views on operations and land needs.

Key Issues

There is wide-spread general support and enthusiasm for the ongoing expansion of Peterborough Airport. The issues present in the following sections are the views and opinions of the interviewed parties. These views, opinions and suggestions are representative of the consulted parties only and do not necessarily represent those of the project team or the City of Peterborough. To ensure the confidentiality of the parties consulted, specific comments made by any proponent are not identified. Throughout the consultation process, a number of common themes emerged and are described in the following sections. Figure A-1 is presented below to be used as a reference in conjunction with the identified stakeholder issues:

Figure A.1 – Airport Reference Site Plan



Airport Availability - Instrument Flight Procedure Minima

Instrument Flight Procedure minima define the lowest altitude to which an arriving aircraft can safely descend in conditions of cloud and/or poor visibility. Airport tenants identified a need for lower approach minimums on the primary Runway 09-27 to enhance operational availability and reliability. Currently, Runway 09-27 is designated as a “Non-instrument” facility, and consequently the lowest minimum decent altitude that can be published is 500 feet above ground level (AGL). The current IFP minima pose problems for operators who operate under Instrument Meteorological Conditions (IMC). Bombardier has missed several aircraft delivery flights to Flying Colours Corporation for major local work, due to poor weather conditions. Bombardier’s flight department operations are similar to an airline as they schedule operations weeks in advance. As a result, if an aircraft is undeliverable due to a missed approach, its delivery schedule is moved to the back of the queue and may take months until another attempt is made. Additionally, charter passenger service is also dependent on having a high airport and runway availability. Currently, passenger charter flights arrive at the Airport one day early to minimize any risks potentially arising from poor weather on the day of departure.

Full Length Parallel Taxiway

Airport tenants voiced the need for a new taxiway to extend beyond Taxiway ‘H’ to the threshold of Runway 09. Operations are currently constrained when Runway 09 is in use as aircraft have to either perform a lengthy backtrack or conduct a takeoff from the intersection of Taxiway ‘H’ and Runway 09.

Operators stated that backtracking poses many operational issues such as delays, runway conflicts and improper use of the runway turnaround bay as a holding bay. Stakeholders also indicated that a parallel taxiway would be valuable to larger aircraft that have longer landing rolls as it would eliminate backtrack operations for these particular aircraft when landing on Runway 27.

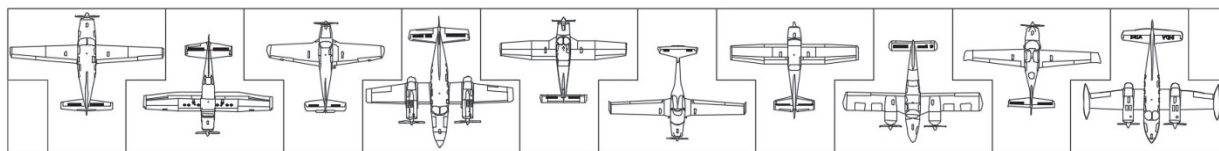
NAV CANADA Air Traffic Service

In 2015, NAV CANADA conducted an Aeronautical Study of the requirement for potential introduction of an Air Traffic Control (ATC) service at Peterborough Airport. The study concluded that an ATC or advisory service was not currently required. Stakeholders are generally supportive of establishing air traffic services at Peterborough Airport. They were not supportive, however, of the establishment of a lower level Flight Service Station (FSS) service at the Airport, as it would increase radio frequency congestion. If an Air Traffic Service (ATS) presence were to be required at the Airport in the future, stakeholders indicated that a radar controlled (ATC) environment would be the preferred solution. The City of Peterborough has requested the addition of an ATS service be reconsidered by NAV CANADA and continues to provide the organization with regular updates and movement data.

General Aviation Development Area

Recreational aviation tenants voiced the need for a more value-oriented General Aviation (GA) development area. Local pilots and aircraft owners stated that not every pilot needs a large private hangar that is serviced. They explained that many owners simply want their aircraft protected from the elements. Interest was shown in development of T-Hangars, where each aircraft has its own “bay” and only requires electrical service for lighting and aircraft pre-heating. Additionally, the Apron III General Aviation development area has been extremely successful and is nearing capacity. Many aircraft owners lease space from hangar owners. Generally, General Aviation airport users indicated there is demand and a requirement for more developable land areas for private hangars and communal T-Hangars as illustrated in Figure A.2.

Figure A.2 - Typical T-Hangar Footprint Efficiency



Canadian Border Services Agency (CBSA)

Consulted parties agreed that improved CBSA services at the Airport would be ideal. Currently, CBSA services for ad-hoc passenger charters are provided on a cost recovery basis and must be pre-arranged with the agency.

The nearest CBSA detachment is located in Trenton, ON resulting in a minimum 2-hour wait time before an officer arrives at the Airport, if not pre-arranged. Stakeholders expressed interest in having CBSA service located on airport to further accommodate trans-border and international operations.

Displaced Threshold Runway 27

Stakeholders operating larger aircraft at Peterborough Airport voiced a desire for the 2,000 foot displaced landing threshold to be removed. The recent runway extension to 7,000 feet currently only benefits aircraft taking off. Removing the displaced landing threshold will benefit businesses requiring higher weight aircraft to land at the Airport. The displacement has been necessitated by obstructions (trees) to the east of the Airport. The Airport is currently attempting to acquire land to facilitate the removal of obstructions associated with the threshold displacement. Consultations with NAV CANADA revealed removal of these obstacles is required to implement an ATS.

Airport Restaurant

The operator of the airport restaurant and other stakeholders voiced concerns that the restaurant is over capacity during peak times such as breakfast and lunch. It draws a significant clientele from Seneca College, including both students and faculty members, as well as customers from airport businesses and weekend users. The restaurant has also become a destination for local residents in the area. The restaurant operator has requested that additional space in the Air Terminal Building be made available to increase the capacity of the restaurant.

Run-up Area for Large Aircraft

Given the industrial nature of the Airport, MRO operations require a run-up area for larger aircraft. The purpose of the run-up area would be to provide a safe place where aircraft engines could be ground tested, without sacrificing safety or causing damage to surrounding operations. These aircraft often have significant jet blast areas that can pose hazards for other aircraft and could be damaging to airside infrastructure such as airfield signage and lighting.

APPENDIX C – AVIATION ACTIVITY AND FORECASTS

Appendix C-1 – General Aviation Activity at Peterborough Airport

	Itinerant Movements						Local Movements			Total
	Carrier	Other Commercial	Private	Civil Government	Military	Total	Civil	Military	Total	
1996	599	519	2,162	117	9	3,476	15,466	7	15,473	18,949
1997	1,443	922	2,873	146	48	5,432	23,360	33	23,393	30,825
1998	1,459	923	3,062	168	35	5,647	15,045	29	15,074	20,721
1999	1,485	552	3,477	205	25	5,744	23,432	30	23,462	29,206
2000	988	535	2,124	173	12	3,832	15,637	39	15,676	19,508
2001	777	704	2,023	173	24	3,701	12,612	30	12,642	16,343
2002	522	726	2,646	83	26	4,003	18,882	146	19,028	23,031
2003	890	1,391	2,281	120	21	4,703	23,463	234	23,697	28,400
2004	726	1,105	2,286	97	22	4,236	14,734	75	14,809	19,045
2005	773	1,398	2,847	105	54	5,177	17,280	89	17,369	22,546
2006	1,054	1,613	2,935	143	84	5,829	8,571	27	8,598	14,427
2007	937	1,474	2,743	131	105	5,390	4,518	2	4,520	9,910
2008	947	1,919	2,649	233	140	5,888	9,263	134	9,397	15,285
2009	1,514	1,346	3,661	268	273	7,062	10,586	116	10,702	17,764
2010	1,700	1,051	3,376	184	244	6,555	21,067	52	21,119	27,674
2011	1,728	871	3,669	189	200	6,657	27,002	58	27,060	33,717
2012	1,912	930	4,365	190	285	7,682	27,570	184	27,754	35,436
2013	1,703	1,223	5,028	170	297	8,421	21,622	213	21,835	30,256
2014	1,116	748	3,658	126	139	5,787	61,961	21	61,982	67,769
2015	1,683	1,076	3,366	184	246	6,555	41,691	0	41,691	48,246
2016	1,196	858	3,617	123	131	5,925	52,581	0	52,581	58,506

Source: Statistics Canada TP 477, Aircraft Movement Statistics

Appendix C-2 General Aviation Forecasts

	Historical		Low		Medium		High	
	Itinerant	Local	Itinerant	Local	Itinerant	Local	Itinerant	Local
1998	5,647	15,074						
1999	5,744	23,462						
2000	3,832	15,676						
2001	3,701	12,642						
2002	4,003	19,028						
2003	4,703	23,697						
2004	4,236	14,809						
2005	5,177	17,369						
2006	5,829	8,598						
2007	5,390	4,520						
2008	5,888	9,397						
2009	7,062	10,702						
2010	6,555	21,119						
2011	6,657	27,060						
2012	7,682	27,754						
2013	8,421	21,835						
2014	5,787	61,982						
2015	6,555	41,691						
2016	5,925	52,581						
2017			5,924	53,659	5,924	53,659	5,924	53,659
2018			6,042	54,732	6,076	55,039	6,210	56,245
2019			6,169	56,195	6,231	56,442	6,509	58,956
2020			6,299	57,375	6,381	57,801	6,823	61,798
2021			6,425	58,522	6,515	59,008	7,151	64,777
2022			6,553	59,693	6,658	60,308	7,496	67,899
2023			6,684	60,887	6,797	61,566	7,857	71,172
2024			6,818	62,104	6,930	62,769	8,236	74,602
2025			6,955	63,347	7,055	63,906	8,633	78,198
2026			7,094	64,613	7,172	64,960	9,049	80,403
2027			7,235	65,906	7,321	66,312	9,485	82,575
2028			7,380	67,224	7,467	67,633	9,943	84,697
2029			7,528	68,568	7,609	68,918	10,422	86,772
2030			7,678	69,940	7,746	70,161	10,924	88,941
2031			7,824	71,269	7,865	71,238	11,451	91,214
2032			7,973	72,623	7,992	72,388	12,003	93,621
2033			8,124	74,002	8,127	73,610	12,581	96,156
2034			8,279	75,409	8,272	74,930	13,188	98,830
2035			8,436	76,841	8,431	76,369	13,823	101,650
2036			8,596	78,301	8,606	77,952	14,490	104,619
2037			8,751	79,711	8,786	79,586	15,188	107,514
2038			8,909	81,146	8,987	81,401	15,920	110,465
2039			9,069	82,606	9,209	83,414	16,687	113,471
2040			9,232	84,093	9,454	85,636	17,492	116,534

Appendix C-3 Forecast for Large Aircraft Passenger Charter Activity

	Passengers			Charter Landings and Takeoffs		
	Low	Medium	High	Low	Medium	High
2017	745	835	835	5	6	6
2018	764	960	960	5	7	7
2019	782	1,104	1,104	5	7	7
2020	798	1,270	1,270	5	9	9
2021	816	1,460	1,460	6	10	10
2022	833	1,679	1,679	6	11	11
2023	849	1,931	1,931	6	13	13
2024	865	2,221	2,221	6	15	15
2025	879	2,554	2,554	6	17	17
2026	897	2,937	2,937	6	20	20
2027	915	3,378	3,378	6	23	23
2028	932	3,884	3,884	6	26	26
2029	949	4,157	4,467	6	28	30
2030	964	4,221	5,137	7	29	35
2031	979	4,289	5,908	7	29	40
2032	996	4,361	6,794	7	30	46
2033	1,014	4,439	7,813	7	30	53
2034	1,033	4,525	8,985	7	31	61
2035	1,055	4,618	10,332	7	31	70
2036	1,077	4,715	11,059	7	32	75
2037	1,101	4,823	11,362	8	33	77
2038	1,129	4,942	11,672	8	33	79
2039	1,159	5,074	11,987	8	34	81
2040	1,192	5,218	12,308	8	35	83

