

# John C. Munro Hamilton International Airport

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## AIRPORT MASTER PLAN



PRYDE SCHROPP McCOMB  
A DIVISION OF GENIVAR

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## Executive Summary

Hamilton International Airport (hi) has served the Hamilton region as the primary air transportation facility since it first became a civil airport in 1964. The Airport is located in the City of Hamilton, immediately northwest of the Mount Hope Urban Area. The Airport lands are approximately 556 hectares in area and are generally bounded by Dickenson Road to the north, old Highway 6 and Homestead Drive to the east, Airport Road to the south and agricultural lands to the west.

In 1996, the Regional Municipality of Hamilton-Wentworth (now the New City of Hamilton) entered into an agreement with TradePort International Corporation for the operation and management of the Airport. TradePort International Corporation, which is wholly owned by YVR Airport Services Ltd. (a subsidiary of the Vancouver International Airport Authority and CITI Infrastructure Investors), operates the Airport under a long term lease agreement with the City of Hamilton to 2036.

### PURPOSE OF THE AIRPORT MASTER PLAN

The primary purpose of the Airport Master Plan is to establish a concept for the Airport which will guide future development in an efficient and cost effective manner, while recognizing the Airport's strategic, operational, and business objectives. The Master Plan also provides a strategic vision for the Airport which can be endorsed by the City of Hamilton and incorporated into its Official Plan.

### AIRPORT'S ROLE

According to Hamilton International's Strategic Plan 2020, the Airport's role is to serve as a secondary passenger gateway to the Southern Ontario region and a primary inter-modal air freighter gateway in Canada. The Airport also provides the capability to accommodate corporate and general aviation users.

The strategic vision for Hamilton International can be summarized as follows:

*To achieve Hamilton International Airport's full potential by becoming*

- *The low cost, friendly gateway to the Southern Ontario region, and*
- *Number 1 inter-modal air freighter gateway in Canada.*

### HAMILTON INTERNATIONAL AIRPORT AVIATION TRENDS

In 1988, hi experienced approximately 141,000 annual aircraft movements. Since then aircraft movements have steadily declined, whereby in 2009 the total annual movements were approximately 42,000. This significant decline in traffic is largely the result of a sharp reduction in the number of local movements. These local movements were generated primarily from flight training and recreational flying - two areas of general aviation that have

been badly hit by the economic downturn and high fuel prices. While local movements have declined, itinerant movements have remained generally stable. Within the itinerant group, there has been a steady increase in the number of air carrier movements - indicative of hi's emerging role as an air cargo/air carrier airport. The following table describes the projected growth in itinerant aircraft movements as identified in a 2008 air traffic forecast prepared by InterVISTAS Consulting Inc.

Itinerant Aircraft Movement Forecast				
Year	Passenger	Cargo	Other	Total
2015	11,800	15,900	27,200	54,900
2020	13,800	17,400	29,100	60,300
2025	15,800	18,600	31,000	65,400
2027	16,200	19,200	31,800	67,200
Source: John C. Munro Hamilton International Airport Air Traffic Forecast, InterVISTAS Consulting Inc. 2008				

Passenger movements at Hamilton International Airport have historically been tempered by the fact that Lester B. Pearson, the primary gateway to North America, is less than an hour's drive from hi. Although the population base of the City of Hamilton is about 15% of Toronto's, the Airport draws from a catchment area that contains 4.2 million passengers per year.

With WestJet's arrival in 2000, the Airport implemented an aggressive plan to develop hi as a hub for WestJet's domestic operations. The public showed support for these services with passenger volumes (connecting and originating) surpassing one million in 2003. The growth of hi was unprecedented in Canadian airport history. The merging of Air Canada and Canadian in 2003 resulted in an opportunity for WestJet to shift their eastern hub to Lester B. Pearson International Airport. The strategic shift by WestJet resulted in a substantial decline in passenger traffic at hi beginning in 2004. From 2006 through 2008, hi was able to recover from the traffic decline with the introduction of services from Canjet, Air Canada Jazz, and FlyGlobespan. In 2009, the Airport experienced 431,557 passengers as services provided by Air Canada Jazz and FlyGlobespan ceased with the economic downturn.

## HAMILTON INTERNATIONAL AIRPORT AVIATION FORECAST

The 2008 forecast generated by InterVISTAS indicates that domestic traffic will grow at an average of approximately 3.6% per annum and will likely reach the peak 2003 level by 2027, the end of the forecast horizon.

International traffic, which has decreased in recent years because of the termination of the FlyGlobespan airline operation, is projected to grow by 5.6 % and 4.7% per annum over the next ten and twenty years respectively. This traffic is expected to be from growth in both scheduled services and seasonal charter services to sun/leisure destinations.

The 2008 Air Traffic Forecast anticipates that in the short to medium term, transborder activity will be comprised of charter flights to sun destinations, but that by 2017, regular scheduled service could be established to a number of US cities.

The following table describes the projected enplaned and deplaned (E/D) passenger forecasts for Hamilton International, as identified in the *John C. Munro Hamilton International Airport Air Traffic Forecast* prepared by InterVISTAS Consulting Inc. in February 2008.

Forecasted E/D Passenger Volumes – Medium Growth				
Year	Domestic	International	Transborder	Total
2007	504,000	148,000	11,000	662,855
2012	647,000	203,000	27,000	877,000
2017	768,000	255,000	67,000	1,090,000
2022	896,000	312,000	80,000	1,288,000
2027	1,030,000	373,000	93,000	1,496,000
Source: John C. Munro Hamilton International Airport Air Traffic Forecast, InterVISTAS Consultants, 2008				

## HAMILTON INTERNATIONAL AIRPORT CARGO TRENDS

With respect to cargo operations, hi already serves as a primary Canadian inter-modal freighter gateway. Hamilton acts as a primary air hub for Purolator Courier and Cargojet, and a Canadian gateway for UPS and DHL. The Airport's lack of congestion and 24 hour operation with no curfew has allowed hi to shift cargo market share from other Canadian airports during the recent economic downturn, resulting in an increase in overall cargo activity. It is anticipated that hi will continue to experience a robust growth of cargo/courier activity in the future. In the Hamilton Airport Strategic Plan<sup>1</sup> courier activities at Hamilton were forecast to grow to 200,000 tonnes by the year 2020, and general air freight was projected to increase to 311,000 tonnes.

## OPPORTUNITIES

In meeting the objectives of the Strategic Plan, the Airport is provided with a number of opportunities. They include:

### Location

The Airport is located within the most densely populated area in Canada. For those living in the western Greater Toronto Area and the Niagara peninsula, the Airport's location reduces the ground travel time and delays associated with traffic congestion.

<sup>1</sup> Strategic Plan 2020, Taking Hamilton International Airport to its Potential, InterVISTAS, 2007

## **Landside Access**

With the construction of new Highway 6 linking the Airport directly to Highway 403, and the Lincoln Alexander and Red Hill Valley Parkways providing improved access from east Hamilton and the Niagara region, access to the Airport has improved significantly in recent years reducing travel times and providing greater customer convenience.

## **Community Interface**

Creation of the Airport Employment Growth District (AEGD) by the City of Hamilton provides opportunities to integrate the Airport with surrounding compatible land uses. The AEGD recognizes the Airport as a focal point for new growth and employment, while at the same time ensuring that lands surrounding the Airport are compatible with its long term operation. A diverse business community, including head offices of international corporations, is located in the immediate vicinity of the Airport.

## **Lack of Night-Time Curfew and Slot Controls**

The fact that Hamilton International Airport has no night-time operational restrictions or slot controls gives the Airport a significant competitive advantage, especially for courier operations and passenger charter flights, which typically operate late at night or early in the morning.

## **Existing Cargo Distribution Network**

The extensive and already developed domestic cargo distribution network can be leveraged as a freight hub for international air cargo activity.

## **Cost Competitive**

Hamilton International Airport offers significant cost savings to airlines and other operators as compared to competitor airports.

## **CONSTRAINTS**

The Airport faces a number of constraints in meeting its long term operational and business objectives. These constraints include:

### **Airside**

During periods of poor meteorological conditions Runway 06 is often the preferred runway orientation. At a present length of 6,000 ft., this runway cannot accommodate the larger aircraft used by air carriers and cargo/courier operators. Similarly, this runway currently has only a non-precision instrument approach which limits its functionality during low visibility. To enhance the all-weather capability of the Airport, Runway 06-24 should be extended and provided with precision approach navigational aids. The acquisition of additional land is required in order to extend Runway 06-24.



The limited existing network of parallel taxiways requires aircraft to backtrack on the runways which in turn reduces airfield capacity, especially during periods of low visibility. To accommodate long term increases in activity and provide greater efficiency, a network of parallel taxiways is required for both Runways 12-30 and 06-24 in the long term planning horizon.

Several of the airside pavements including Runway 12-30 and 06-24 are showing signs of distress and need to be rehabilitated in the short term.

### **Airport Support**

Both the airport maintenance garage and the fire hall do not have adequate space in which to accommodate equipment and provide appropriate administrative and staff support functions. Both of these facilities will require some modernization and expansion over time as business activity grows.

### **Commercial Development**

The Airport lacks sufficient land in the long term on which to accommodate future development requirements. The *Airport Employment Growth District – Airport Market Analysis and Land Needs Study*<sup>2</sup> prepared in 2009 for the City of Hamilton identifies a requirement for approximately 90 ha of additional land for airport commercial development and a further 145 ha of land for airside/landside support functions.

### **Utilities and Services**

Expansion of commercial development at the Airport will be somewhat predicated on the availability of municipal services and utilities. With the City of Hamilton's development of the Airport Employment Growth District (AEGD) it will be important to ensure that appropriate services are brought to the Airport. A servicing plan (utilities, water, sewer, storm water management) has been developed as part of the AEGD.

Similarly, with the future expansion of commercial development, it will be important that appropriate storm water management systems are put in place to ensure that post-development runoff meets pre-development conditions with respect to water quality and quantity.

### **Landside Access**

Many areas within the potential catchment area still do not have convenient direct access to the Airport.

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<sup>2</sup> Airport Employment Growth District – Phase 2 – Airport Market Analysis and Land Needs Study, Dillon Consulting, 2009

## **PREFERRED AIRPORT DEVELOPMENT PLAN**

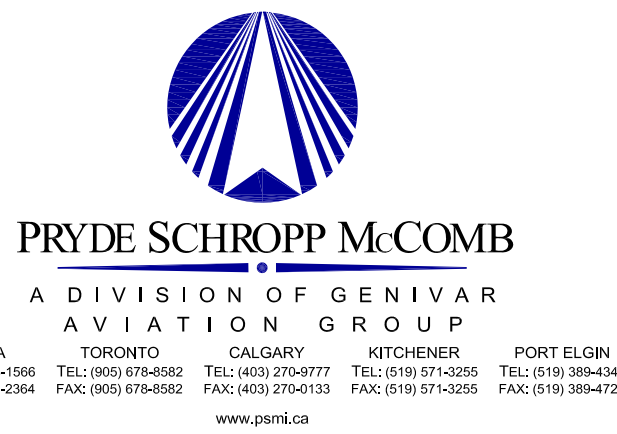
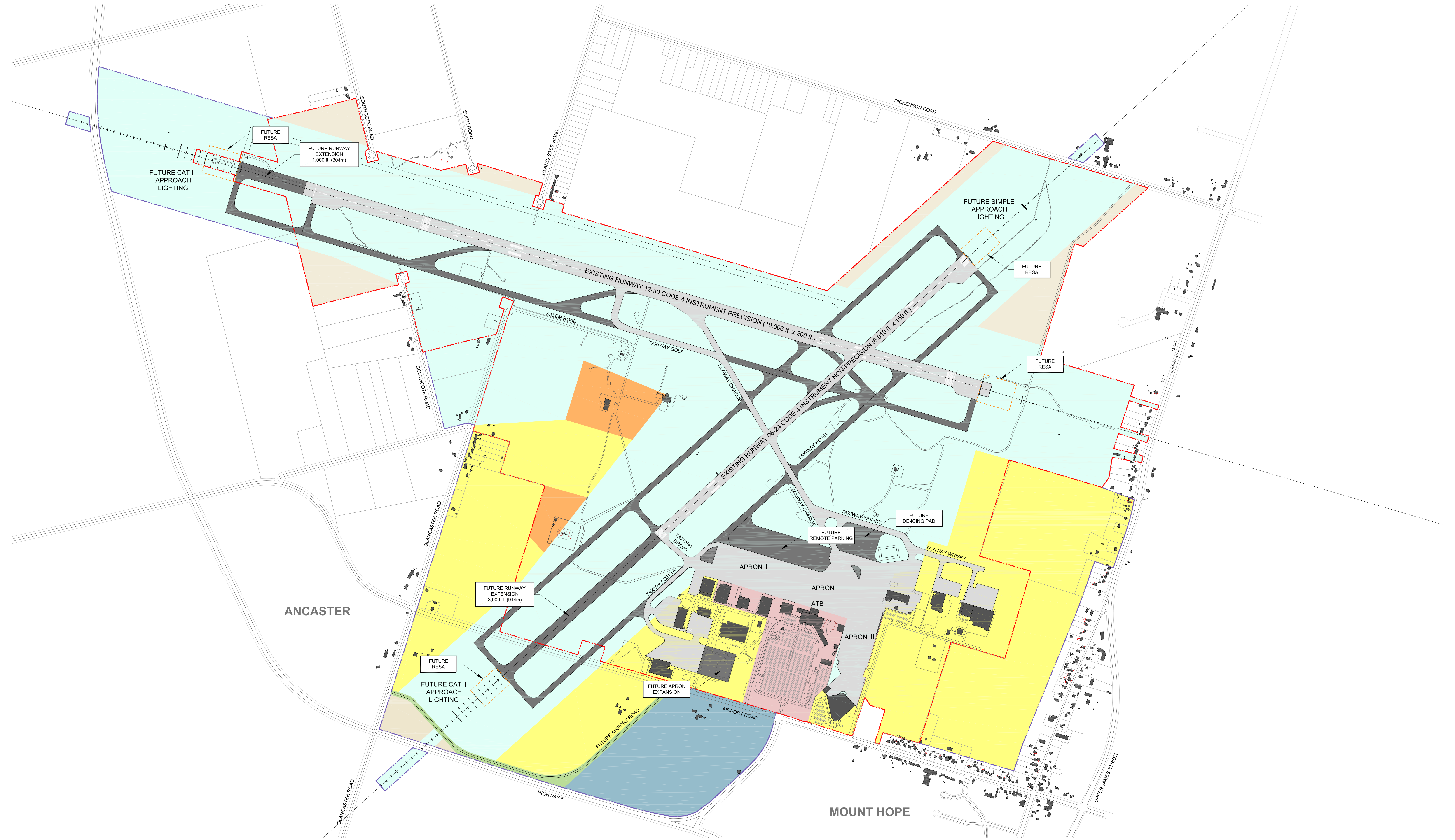
The following figure provides the preferred Airport Development Plan that will meet the long term operational and business objectives of the Airport. In support of this plan, specific recommendations of the Airport Master Plan include the following:

### **Airport/Community Interface**

- Consistent with past practice, that the Noise Exposure Forecasts be updated when significant changes to activity levels, aircraft mix and/or operational procedures have been identified or are anticipated.
- The City of Hamilton, over time, purchase residential properties located immediately adjacent to the Airport on lands that have been identified as Airport Reserve through the AEGO secondary study.
- The City of Hamilton enforce the 'Airport Influence Area' with respect to new development and modify the extent and intent of the Airport Influence Area as may be required in the future to ensure the compatibility of land use surrounding the Airport.
- Amendments to the current Registered Airport Zoning for the Airport, currently being undertaken, be implemented to accommodate the extension of Runway 06-24 to 2,743 m (9,000 ft.).
- The City of Hamilton identify land areas to be protected against the erection of obstacles that could jeopardize the licensing and operation of the Airport in its final configuration and support this protection through the application of appropriate municipal by-laws and zoning controls.



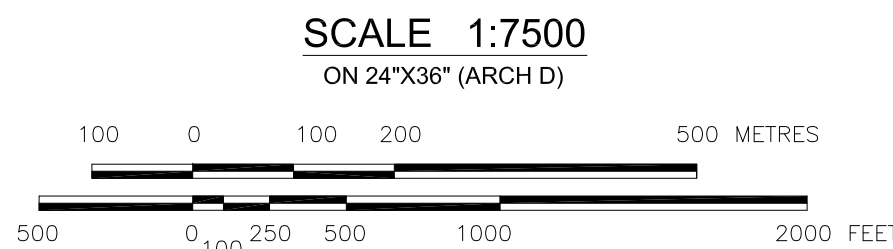
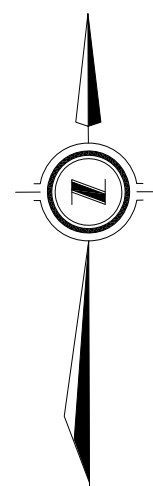
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Revisions				
No.	Description	By	App'd.	Date
0	FIRST DRAFT	JJH	GB	DEC-2010
1	FINAL REPORT	JJH	GB	APR-2011
Notes				
1. FOR PLANNING PURPOSES ONLY.				
2. EXISTING AIRPORT PAVEMENTS BASED ON THIRD PARTY DATA.				
3. DRAWING SHOWN IN UTM PROJECTION NAD27 ZONE 17.				
4. RUNWAY STRIP AND APPROACH SURFACES BASED ON TP312 4TH EDITION.				
5. BUILDINGS, ROADS AND TOPOGRAPHICAL FEATURE LOCATIONS ARE APPROXIMATE ONLY - BASED ON THIRD PARTY INFORMATION.				



GENERAL LEGEND			
	EXISTING AIRPORT BOUNDARY		FUTURE AIRPORT BOUNDARY
	EXTENDED RUNWAY CENTRELINE		EXISTING LEGAL BOUNDARY
	EXISTING ROAD		FUTURE ROAD
	FUTURE RUNWAY END SAFETY AREA		FUTURE AIRSIDE PAVEMENTS
	EXISTING STRUCTURE / BUILDING		AIRSIDE COMMERCIAL
	EXISTING AIRSIDE PAVEMENT		LANDSIDE COMMERCIAL
	FUTURE AIRSIDE PAVEMENTS		AIRPORT SUPPORT
	FUTURE STRUCTURE / BUILDING		TRANSPORTATION RESERVE
	AIRPORT RESERVE		TERMINAL RESERVE
	AIRSIDE RESERVE		

Client/Project			
HAMILTON INTERNATIONAL AIRPORT 20 YEAR MASTER PLAN UPDATE			
Hamilton, ON			
Title			
FIGURE 6.1 HAMILTON INTERNATIONAL AIRPORT FUTURE DEVELOPMENT PLAN			
Designed by: JJH	Scale: 1:7500 (24X36 SHEET)		
Own by: JJH	Reviewed by: GB	Project No.	
Revision: 1	Drawing No. FIG 6.1	06349	



## **Airport Ground Access**

It is recommended that:

- The City of Hamilton initiate the process of acquiring lands required to accommodate the eventual extension of Dickenson Road to Book Road.
- The City of Hamilton develop a new service road to be located north of the New Highway 6 right-of-way between the Terminal Access Road and Butter Road. This road will be required when Runway 06-24 is extended.
- The City of Hamilton develop a new road that would be intended for the access of future airside and airport commercial developments located east of the current airport boundary and west of Existing Highway 6.
- The City of Hamilton construct a direct link to the new Red Hill Creek Parkway / Lincoln Alexander Parkway intersection to improve road access between the Airport and the QEW (from the east).
- The City of Hamilton continue development work for the future provision of light rail transit to the Airport, via the A-Line corridor.
- Hangar Road be reconstructed to accommodate traffic access and provide proper stormwater drainage.
- The East Cargo Road be realigned to accommodate the development of commercial lands located immediately east of Apron III.

## **Airside Reserve**

It is recommended that:

- Hamilton International Airport Limited should give consideration to the development of the following projects in the short term (1 to 5 year timeframe):
  - Resurfacing of Runway 12-30.
  - Rehabilitation of Runway 06-24.
  - Provision of ODALS on Runway 06.
  - Extension and upgrading of Taxiway Delta to Code D standards to serve expanded commercial development.
  - Construction of new taxiway located east from Apron III to serve expanded commercial development.
  - Construction of new taxiway to serve future General Aviation development west of Runway 06-24.
  - Provision of additional airside perimeter roadways; wild life control roads, and emergency access roads to provide maintenance and emergency access.

- That the City of Hamilton give consideration to the acquisition of lands located south of Airport Road and north of the proposed New Highway 6 Airport access corridor, to accommodate potential expansion of airside and terminal reserve infrastructure.
- Hamilton International Airport Limited should give consideration to the development of the following projects in the medium term (5 to 10 year timeframe) as demand requires:
  - Expansion of Runway 06-24 to 2,743m (9,000 ft.).
  - Provision of Runway Emergency Stop Areas (RESA's) for all runways.
  - Upgrading existing portions of Runway 06-24 to PLR 12.
  - Provision of CAT II ILS on Runway 06.
  - Upgrade of ILS on Runway 12 to CAT III.
  - Construction of parallel taxiway to Runway 12-30.
  - Construction of parallel taxiway to runway 06-24.
  - Provision of new high speed exits on Runway 12-30.
  - Provision of parallel taxiway access to terminal area from Runway 12-30.
- Hamilton International Airport Limited should give consideration to the development of the following projects in the long term (10 to 20 year timeframe):
  - Extension of Taxiway Whisky to accommodate future air cargo development.
  - Construction of taxiway parallel to the west side of Runway 06-24.
  - Construction of taxiways to serve future Dickenson Road commercial development.

### **Airport Support**

It is recommended that:

- The City of Hamilton implement the AEGD Secondary Zoning Study to ensure sufficient lands adjacent to existing airport support functions to accommodate future expansion.
- A new sand storage facility be constructed as part of the infrastructure improvement plan.
- A detailed facility requirements program be developed for the Combined Airside Operations centre for provision of maintenance and emergency response services.

### **Airside Commercial**

It is recommended that:

- Development on lands located within existing Airport boundaries be maximized to meet the short-term demand for airside commercial development.
- The lands east of Apron III be developed for commercial cargo development.

- The development concept as set out in Figure 6.1 with respect to the medium and long-term development of airport commercial land uses be implemented.

### **Non-Airside Commercial**

It is recommended that:

- The development concept as set out in Figure 6.1 with respect to the development of Non-Airside Commercial land uses be implemented.
- The City of Hamilton proceed with final amendments to the Urban Official Plan and completion of Secondary Plans to support the rezoning of lands identified under the Airport Employment Growth District as 'Airport Related Business (ARB) and Airport Related Commercial (ARC).
- The City of Hamilton proceed with the development of infrastructure required to support land uses identified under the Airport Employment Growth District.

### **Utilities/Services**

It is recommended that:

- The City of Hamilton provide the appropriate water and sanitary services to accommodate demands that will be imposed by future development as identified in the Airport Master Plan. This includes the provision of new and upgraded services.
- The City of Hamilton Storm Water Management Plan for the Airport employment Growth District have due regard for the Airport Master Plan.

# Introduction

## 1.1 MASTER PLAN PURPOSE

The primary purpose of the Airport Master Plan is to establish a rational development concept for the Airport, which protects and preserves options for the Airport's operation and future expansion. The Airport Master Plan establishes objectives for airport development through to the year 2030, and serves as a guide for development decisions and implementation management. The Airport Master Plan also serves as a framework for planning. As a management tool, it assists the airport management team in making informed decisions about the timing of future improvements, courses of action and preferred development solutions.

The Airport Master Plan provides a strategic vision for hi's future, which can be endorsed by the local community and be incorporated into the City of Hamilton's official plans.

To ensure that the Airport Master Plan remains a valid and living planning document, it must be continually reviewed and updated. It is the intent of Hamilton International Airport Ltd. to review and update (where necessary) the Airport Master Plan every five (5) years.

The requirement to prepare an Airport Master Plan was identified in the Transfer Agreement between the City of Hamilton and TradePort International Corporation, and as such, is described under Article 7 of the Transfer Agreement. Under Article 7 of the Transfer Agreement states that the Airport Master Plan shall:

- *Relate to lands outside and adjacent to the Airport, and consider airport operations and identify land expansion forecast requirements for airport purposes.*
- *Consider land uses within the 3200 acre area defined by Dickenson/Book Roads to the north, the new Highway 6 Airport Expressway to the south and west, the existing Highway 6 / Village of Mount Hope and the Aeropark lands to the east.*
- *With respect to other lands surrounding the Airport, and contained within the Airport's Noise Exposure Forecast Contours, designate preferred non-conflicting land uses which will be proposed by the tenant to be incorporated into the regional and local official plans in order to better ensure land use compatibility between the Airport and surrounding lands.*
- *As it affects the Airport lands, establish a hierarchy and priority of land uses. The highest priority shall be accorded to the provision of sufficient lands for runways, taxiways, parallel taxiways, aprons and other elements of airport infrastructure, with subsequent priority accorded to lands for passenger and cargo terminals and facilities.*
- *Provide for both interim and permanent uses.*

Article 7 of the Transfer Agreement further states that the Airport Master Plan shall provide for the long-term development of the Airport and shall address the following:

- *Socioeconomic profiles: local, community, regional.*
- *Airport activity: role, classification and history.*
- *Airport environmental management and impact.*
- *Airside.*
- *Airport terminal building.*
- *Ground transportation system.*
- *Airport commercial services and facilities.*
- *Expansion plan.*
- *Noise management plan.*
- *Land use.*

## **1.2 GOALS AND OBJECTIVES**

The primary goal of the Airport Master Plan is to identify an optimum development concept for the Airport that will accommodate short term operational and functional demands, while preserving the flexibility to meet long term expansion opportunities and utilizing sustainable development strategies. Specific objectives include:

- To assess the adequacy of the existing airport infrastructure to meet current and potential demand.
- To identify potential demand for various airport facilities.
- To establish the optimum form of development for the Airport in the short, medium and long term and define the scale of facilities necessary to satisfy demands that emerge within the planning period.
- To identify all land areas to be reserved for aviation and non-aviation development and establish a hierarchy and priority of land uses.
- To identify land areas to be protected against the erection of obstacles that could jeopardize the licensing of the Airport in its ultimate configuration.
- To provide a development plan that provides implementation phasing.
- To harmonize the planning and development objectives of the Airport with those of the local municipality to ensure compatibility.
- To identify potential impacts on the community.
- To identify appropriate environmental management practices consistent with the proposed operation and development of the Airport.



### 1.3 AIRPORT HISTORY

Flying activities at the John C. Munro Hamilton International Airport (Airport) first started in October 1940 when the Airport began operations as a flying training school. Constructed under the British Commonwealth Air Training Plan (BCATP), the Airport was originally laid out in a three runway triangular pattern, typical of the many training airfields that were built as part of the war effort. The original three runways were each 945 meters (3100 ft) in length. In the late 1950's, with the introduction of jet aircraft into the Royal Canadian Air Force, Runways 06-24 and 12-30 were extended to 1,828 m (6,000 ft) and 1,524 m (5,000 ft) respectively.

Facilities originally constructed for the military included several large hangars and numerous smaller buildings that were used as barracks, administration offices and workshops. With the exception of the four hangars, all of the wartime structures have since been demolished.

Military activities continued at the Airport until 1963, when the Department of National Defense declared the Airport surplus to its needs and the ownership was transferred to the federal Department of Transport (now Transport Canada). Transport Canada managed the operation of the Airport until 1967. At that time an agreement was reached with the City of Hamilton whereby the City would assume responsibility for the operation and maintenance of the Airport. Under the agreement, the federal government supported the Airport's operation through the contribution of a direct subsidy to cover approved operating deficits and capital expansion projects.

In the mid - 1980's a number of major capital projects were undertaken at the Airport. These included the construction of a new 2,438m Runway 12-30, a new air terminal building, an air traffic control tower, and an equipment maintenance garage. With the construction of the new runway, Runway 16-34 was decommissioned and converted to Taxiway "Charlie" to provide access to the new runway from the terminal area.

In the mid - 1990's the Airport experienced further expansion with the development of a number of aviation-related facilities including the Transport Canada Services Hangar, hangar facilities for Ontario Flightcraft, the Canadian Warplane Heritage Museum and the UPS sort facility.

In July 1994, Transport Canada announced the National Airports Policy (NAP). Under NAP, Transport Canada proceeded to divest itself from the ownership of local and regional airports throughout Canada. On December 20, 1996, the ownership of the Airport was transferred to the Regional Municipality of Hamilton-Wentworth. Lacking the expertise to effectively manage the Airport on a day-to-day basis, the regional government turned to the private sector. Through a competitive bid process, TradePort International Corporation was selected to undertake responsibility for the management, operation and financing of the Airport. TradePort assumed this responsibility on July 1, 1996 and operates the Airport today through a wholly owned subsidiary company named Hamilton International Airport Limited (HIAL).

Over the past fifteen years, the Airport has seen a number of capital improvements. These include the addition of the UPS and Purolator sort facilities, numerous hangar developments, apron and taxiway construction, and expansion and renovations to the Airport Terminal Building.

#### 1.4 AIRPORT SETTING

The John C. Munro Hamilton International Airport (hi) has served the Hamilton region as the primary air transportation facility since it first became a civil airport in 1964. The Airport is located in the City of Hamilton, immediately, to the northwest of the Mount Hope Urban Area. The Airport lands are approximately 556 ha in area and are generally bounded by Dickenson Road to the north, Upper James Street and Homestead Drive to the east, Airport Road to the south and the agricultural lands to the west. The regional location of the Airport is illustrated in Figure 1.1.

**Figure 1.1 Regional Location**



Source: Hamilton International Airport

The Airport serves as a primary transportation facility for a large geographical area that includes the City of Hamilton, the Regions of Niagara, Haldiman-Norfolk, and the County of Brant. The Airport also serves as a secondary airport to the Greater Toronto Area and Southern Ontario.

Figure 1.2 illustrates the catchment areas associated with Hamilton International Airport.

**Figure 1.2 Catchment Areas**



Source: Hamilton International Airport

## 1.5 AIRPORT ADMINISTRATION

In 1996, the Regional Municipality of Hamilton-Wentworth (now the New City of Hamilton) entered into an agreement with TradePort International Corporation for the operation and management of the Airport. TradePort International Corporation, which today is wholly owned by YVR Airport Services Ltd. (a subsidiary of the Vancouver International Airport Authority and CITI Infrastructure Investors), operates the Airport through a subsidiary company called Hamilton International Airport Limited (HIAL).

## 1.6 ASSUMPTIONS

The following assumptions were made in the preparation of the Airport Master Plan:

- The limits of airport activity and associated airport-related land use are generally bounded by Dickenson and Book Roads on the north, the hydro corridor and New Highway 6 on the west, New Highway 6 on the south and Upper James St. on the east.
- The Airport will continue to operate on a 24-hour basis.
- The focus of future airport activity will be air cargo/courier and passenger activities, and general aviation activity such as flight training and corporate charter services.

- The Airport will continue to be owned by the City of Hamilton and operated, managed, and financed by the private sector.

## 1.7 COMPETITIVE ENVIRONMENT

hi operates in a competitive industry. Recognition of this competitive environment is essential in airport planning. The following analysis of the competitive environment was taken into consideration when developing the master plan recommendations to maximize future competitiveness, and hence future potential of the Airport.

### 1.7.1 Competitor Airports

Hamilton International Airport faces direct competition from a number of airports located within a 100 km radius. These airports include the following:

#### **Lester B. Pearson Toronto International Airport**

Located in Mississauga and operated by the Greater Toronto Airports Authority (GTAA), Pearson International is currently the most significant competitor for passenger and cargo business given its size, proximity to downtown Toronto, and critical mass of connecting worldwide service. However, characteristics of Pearson International, including limited availability of developable airside land, night-time flight restrictions and congestion, create competitive opportunities for alternate airports within the region, including Hamilton.

#### **Region of Waterloo International Airport**

The Region of Waterloo International Airport continues to emerge as a competitive threat for passenger service and general aviation development within the region. Currently the airport is served year-round by WestJet, with direct flights to Calgary, and Bearskin Airlines with direct flights to Ottawa and Montreal, and seasonally by leisure air carriers with flights to sun destinations. The airport is owned by the Region of Waterloo, which subsidizes airport operation and capital investment. The airport is extremely aggressive in attracting passenger service and corporate general aviation activity, and in recent years has extended the main runway to 7,000 ft., constructed a new Passenger Terminal Building, and expanded its commercial development areas.

#### **Billy Bishop Toronto City Airport**

Located on the Toronto Islands near downtown Toronto, the Billy Bishop Toronto City Airport (BBTCA) is operationally constrained due to limited runway length (4,000 ft.) and by operating restrictions which prohibit jet aircraft, plus limit the total number of annual movements. Despite these restrictions the airport has in recent years experienced significant growth in regional domestic and transborder passenger activity. This is due to the introduction of Porter Airlines which uses the airport as a hub for its regional operations to various domestic and US cities. In 2010 the airline opened a new 10 gate

terminal facility to accommodate its operations and is actively pursuing the provision of a US preclearance function to serve its US operations. In 2011, Porter Airlines will be joined by Air Canada (operated under contract by Sky Regional Airlines).

Although BBTCA, due to its location, does not pose a direct competitive threat to Hamilton International Airport, it does attract a strong market which might otherwise seek other transportation opportunities. It is anticipated that in 2011 BBTCA will serve over 1 million passengers.

### **London International Airport**

The London Airport Authority has been aggressive in expanding facilities including a significant investment in a reconstructed terminal building. While not a significant competitor for Golden Horseshoe traffic, London Airport is a competitor for passengers originating in South Western Ontario who would also consider Hamilton as an alternative, especially for leisure charter or longer haul destinations. London International Airport is currently undertaking a major renovation and expansion to the Airport Terminal Building which includes the provision of passenger boarding bridges. The airport also recently received government funding for the construction of a new cargo facility and has completed construction of the facility. This will allow them to potentially compete with hi in the cargo market.

### **Buffalo, New York Airport**

Buffalo is a significant competitor for travelers originating from the Niagara Peninsula and Southern Ontario destined to cities in the USA. Buffalo is also a competitor for USA bound cargo originating in Southern Ontario, as using Buffalo allows Canadian shippers to clear customs by truck while in custody of their own goods before air shipment, as opposed to relying on agents to facilitate customs clearing on their behalf once goods arrive at the destination.

The significantly lower operating costs for air carriers, translates into lower air fares, which in turn is a significant draw to Canadian travelers looking for cheaper travel alternatives.

### **Niagara Falls, New York Airport**

Niagara Falls International Airport is operated by the Niagara Frontier Transportation Authority, the operator of the Buffalo International Airport. The airport recently constructed a new terminal building and is catering to a number of low cost air carriers including Spirit Airlines, which provide flights to sun destinations in the southern USA.

Another advantage of this airport is that it has ample lands and vacant aprons on which to accommodate cargo/courier operations.

## **Proposed Pickering Airport**

The proposed Pickering airport is a significant potential competitor even though the decision to proceed with its development has yet to be confirmed by the federal government. To the degree that the proposed Pickering Airport is promoted as a secondary airport for the Greater Toronto Area (GTA), government support and public attention potentially shifts away from the role Hamilton can play within the region. This is extremely important in the context of provincial land use planning and participation in infrastructure funding programs.

The *Pickering Airport Draft Plan Report* prepared by the GTAA in 2004, suggests that some corporate general aviation activity could potentially relocate from Hamilton to Pickering, and that this could represent approximately 8,000 annual movements by 2032. It should be noted that since this report was prepared there has been a general downturn in aviation activity at Pearson International Airport and some of the urgency to construct a reliever airport for the GTA has diminished. In 2007, the GTAA was further tasked with preparing a *Needs Analysis Study* which has been completed and is currently under review by Transport Canada. It is anticipated that Transport Canada will provide a decision on the fate of the Pickering Airport Lands sometime in early 2011.

### **1.7.2 Strengths / Opportunities**

Primary strengths of the Hamilton International Airport include:

#### **Location**

The Airport is located within the most densely populated area in Canada. For those living in the western Greater Toronto Area and the Niagara peninsula, the Airport's location reduces the ground travel time and delays associated with traffic congestion.

#### **Landside Access**

With the construction of new Highway 6 linking the Airport directly to Highway 403, and the Lincoln Alexander and Red Hill Valley Parkways providing improved access from east Hamilton and the Niagara region, access to the Airport has improved significantly in recent years reducing travel times and providing greater customer convenience.

#### **Community Interface**

Creation of the Airport Employment Growth District (AEGD) by the City of Hamilton provides opportunities to integrate the Airport with surrounding compatible land uses. The AEGD recognizes the Airport as a focal point for new growth and employment, while at the same time ensuring that lands surrounding the Airport are compatible with its long term operation. A diverse business community, including head offices of international corporations, is located in the immediate vicinity of the Airport.



### **Lack of Night-Time Curfew and Slot Controls**

The fact that Hamilton International Airport has no night-time operational restrictions or slot controls gives the Airport a significant competitive advantage, especially for courier operations and passenger charter flights, which typically operate late at night or early in the morning.

### **Existing Cargo Distribution Network**

The extensive and already developed domestic cargo distribution network can be leveraged as a freight hub for international air cargo activity.

### **Cost Competitive**

Hamilton International Airport offers significant cost savings to airlines and other operators as compared to competitor airports.

## **1.7.3 Primary Weaknesses / Threats**

Primary weaknesses and threats include:

### **Road Access**

Construction of the new Highway 6 connection to Highway 403 has greatly improved ease of access to Hamilton International from the Highway 403 corridor. Similarly, the Lincoln Alexander and Red Hill Valley Parkways have improved access from the Niagara Peninsula and east Hamilton. However, access from the Kitchener-Waterloo-Guelph area continues to be a significant weakness, and the shortest connection between the Airport and the Lincoln Alexander and Red Hill Valley Parkways (Upper James Street) is often congested. It is important that direct limited access corridors are provided to ensure competitive timely access to the Airport from the entire catchment area. To the extent that access to the Airport is indirect, Hamilton International Airport will continue to be perceived as less accessible than other airports with direct highway access.

### **Reliability during Severe Winter Conditions**

Runway 06-24 is generally the preferred runway orientation during severe winter storms with strong North-East winds where flight operations are under Instrument Meteorological Conditions (IMC). The existing runway is too short for many of the aircraft operating at hi, and does not have an instrument landing system. This is a significant competitive issue as Pearson International and Buffalo do not have aircraft operating limitations due to runway length and landing systems.

## **Airport Related Development Land**

While there is no shortage of unoccupied land in the vicinity of Hamilton International Airport, land ready for development (zoned and serviced) is significantly limited and primarily outside control of the Airport. This is a significant competitive disadvantage, as hi competes with many other airports in Canada for airside commercial development.

Airports often lease airside land at less than cost recovery to facilitate increased aeronautical operations and encourage fixed investment by an airline. As airports typically operate on some form of aeronautical cost recovery, increased aeronautical activity reduces user fees, increasing competitiveness of the airport, generating greater economic impact for the community as a whole. Given the limitation of airport controlled land ready for development, Hamilton International Airport is at a significant disadvantage compared to other airports when competing for airside development. Privately controlled land is not necessarily a competitive solution given the need to achieve a rate of return, which may make the cost of development unattractive compared to other airports.

The *Airport Employment Growth District – Airport Market Analysis and Land Needs Study*<sup>3</sup> prepared in 2009 for the City of Hamilton identifies a requirement for approximately 90 ha of additional land for airport commercial development and a further 145 ha of land for airside/landside support functions.

## **Non-Suitable Land Development**

Residential development continues to expand in the vicinity of Hamilton International Airport. It is critical that land use planning restrict non-complimentary development surrounding the Airport. An increase in residential development will bring an increase in noise related issues with the potential to jeopardize unrestricted night-time flying and the expansion of Airport infrastructure.

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<sup>3</sup> Airport Employment Growth District – Phase 2 – Airport market Analysis and Land Needs Study, Dillon Consulting, 2009

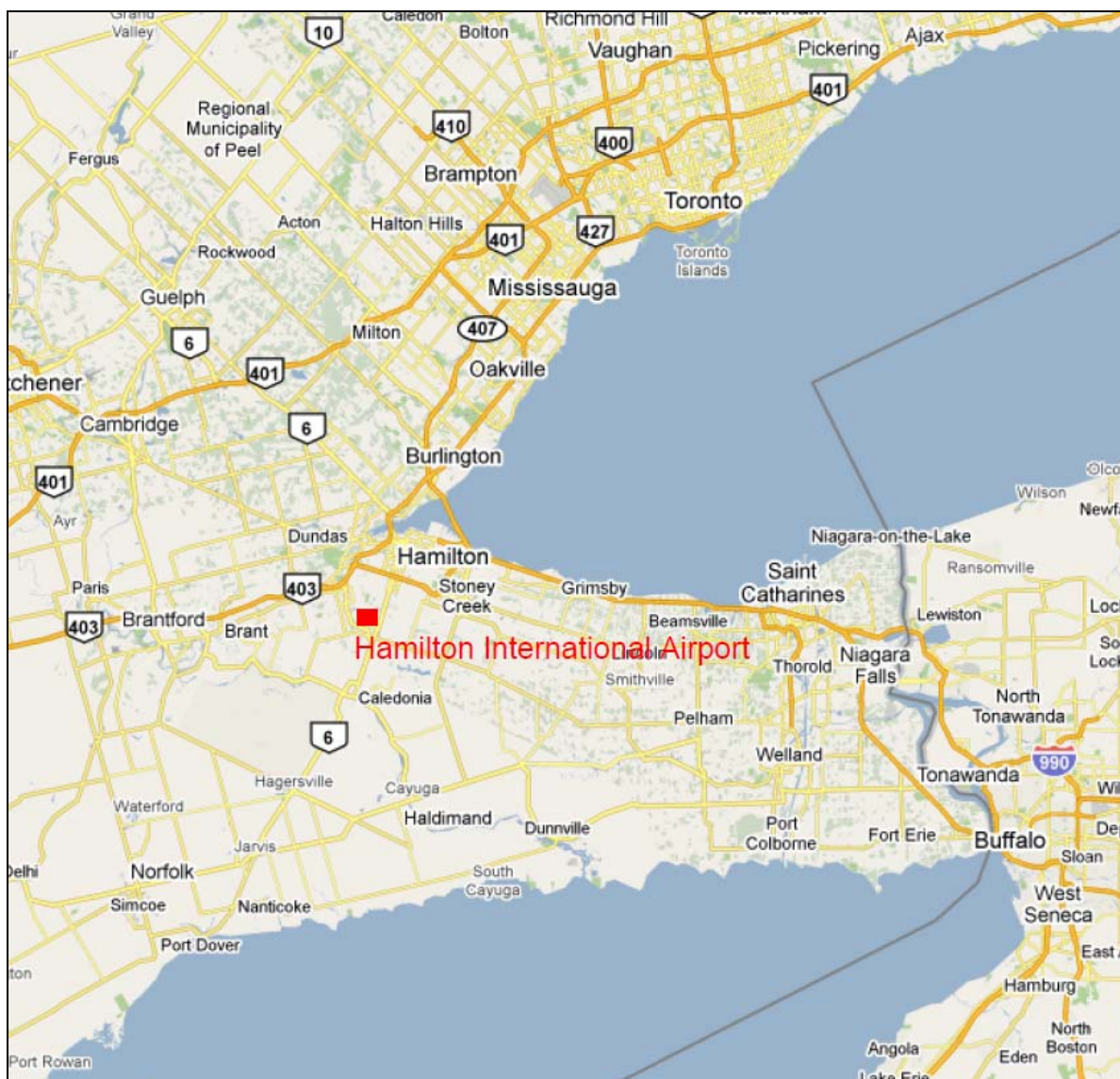


## 2.0 Site Conditions

### 2.1 LOCATION AND GROUND ACCESS

Hamilton International Airport is located immediately west of the intersection of Upper James Street (old Highway 6) and Airport Road in the City of Hamilton. The Airport is approximately fifteen minutes driving time from downtown Hamilton, forty-five minutes from St. Catharines, and 60 minutes from Toronto. The Airport's relative location is illustrated in Figure 2.1.

**Figure 2.1 Relative Location**



Source: Google Maps

The primary means of access to hi is by private vehicle. The Airport is also served by taxi, private shuttle vans and public transit busses.

Hamilton International Airport is served by the provincial highway and regional road system. Primary access routes include Highway 6 to Highway 403, and Upper James Street which leads to The Lincoln M. Alexander Parkway / Red Hill Valley Parkway, which in turn leads to the Queen Elizabeth Way (QEW) east of the Burlington Skyway.

### **2.1.1 New Highway 6 Airport Expressway**

The new Highway 6 Airport Expressway, which opened in fall 2004, now provides direct highway access to the Airport from Highway 403. The highway has two interchanges to ultimately serve the Airport. One interchange is located directly south of the air terminal access road. This interchange serves the existing terminal building and commercial development lands located off of Airport Road. The second interchange is provided at Book Road and provides access to the north of the Airport via Book Road and Dickenson Road. Currently, no direct access to the Airport is provided from the Book Road interchange. To access the lands adjacent to Dickenson Road, it will be necessary to extend Dickenson Road west of Glanaster Road to intersect with Book Road.

The New Highway 6 reduces travel times to Hamilton International Airport and enhances road safety, public access and awareness of the Airport. To accommodate future increases in traffic, there is the capability to expand New Highway 6 to 4 lanes.

### **2.1.2 Lincoln M. Alexander / Red Hill Valley Parkways**

The Lincoln M. Alexander / Red Hill Valley Parkways link Highway 403 to the QEW at Stoney Creek. The recently completed parkway improves access to the Airport from Hamilton and the Niagara Region.

The completion of these highway systems provides an improved corridor to the Airport for courier / cargo trucks and other vehicles, thereby mitigating potential community impacts that may be generated by potential increases in trucking activities. However, the benefits of this new access are somewhat diminished because the signed route via highway 403 and New Highway 6 is not the most direct. The most direct route from the parkways to the Airport is via Upper James Street (old Highway 6). This route has become very congested with traffic due to the extensive commercial development served by the road.

### **2.1.3 Niagara to GTA Transportation Corridor**

In 2001, A Niagara to GTA Transportation Corridor (formerly called the Mid-Peninsula Transportation Corridor) was identified in a needs assessment prepared by the Ontario Ministry of Transportation. The proposed limited access highway would provide additional transportation capacity in the Niagara Peninsula, by linking Fort Erie with the Greater Toronto Area via Highways 403/407. It had been anticipated that Hamilton International

Airport could significantly benefit from the construction of the new highway as it would provide improved access to the Niagara region and to the US border.

In June 2010 development of the Corridor was placed in doubt with the release of a draft study which suggested that such a highway would not be required for another 20 years and that the province should focus on expanding the region's existing highway system.

#### 2.1.4 Public Transit

Hamilton international Airport is presently served by a public transit bus route which connects the Airport with the City of Hamilton. Planning is currently underway by the City to construct a light rail transit (LRT) system. Illustrated in Figure 2.2, the rapid transit system includes a line which would connect the Airport with the downtown and the GO Transit station. First phase of the LRT is scheduled to be operational by 2015. The transit line connecting the Airport is scheduled to be completed within 15 years.

Along with the construction of the LRT line to the Airport, a station will need to be constructed adjacent to the Airport Terminal Building

**Figure 2.2 Proposed City of Hamilton Rapid Transit System**



## 2.2 TOPOGRAPHY

Hamilton International Airport is situated on the Haldimand Clay Plain approximately 8 km south of the Niagara Escarpment. Geological mapping of the area indicates a substantial thickness of fine-grained soils overlaying bedrock. Mapping compiled in 1968 indicates 20

to 30 m of soil over bedrock at the Airport site. The topography of the Airport site is generally flat, with some shallow depressions associated with the local drainage system. The most significant changes in elevation occur in areas immediately east and west of the thresholds of Runway 12-30, where drainage gullies cause the land to fall as much as 6 m over a relatively short distance.

In an environmental inventory prepared in 1994 as part of the Southern Ontario Area Airports Study (SOAAS), four main stratigraphic units were described for the Airport site. On the surface there are glaciolacustrine silts, clays and sands of glacial Lake Warren. Underlying this is the Halton Till, which itself is composed of silts and clays. This till grades into another glaciolacustrine clay and silt unit, which rests on the Wentworth Till overlaying the Guelph Formation bedrock.

The environmental inventory states that there are indications that an aquifer exists at a depth of 20 to 30 metres beneath the Airport property. A perched water table exists close to ground surface and is the source of much of the surface water draining from the Airport. It is also the source of well water for some neighboring residences.

## **2.3 DRAINAGE**

The Airport is located on a crown of land that straddles two distinct watersheds. The divide between the two catchment areas is Taxiway Charlie, which runs from southeast to northwest through the Airport property, and Runway 12-30. The north and west portions of the Airport drain into the upper reaches of Twenty Mile Creek. This creek empties into Lake Ontario at Jordan Harbor. The south and east portions of the Airport drain into the upper reaches of the Welland River. The Welland River drains into the Welland Canal. Lake Niapenco is located on the Welland River only a few kilometers from the Airport.

Stormwater on the Airport is conveyed on site through open ditches, natural channels and storm sewers. Storm water from the intermittent creeks north of Runway 12-30 is conveyed under the runway through large diameter storm sewers.

The main branch of the Welland River and a portion of Twenty Mile Creek have been designated as being warm water fisheries. The remainder of the watershed including, much of the drainage on lands identified under the scope of this Airport Master Plan have not been classified.

## **2.4 ENVIRONMENTAL CONSIDERATIONS**

The Draft Master Plan prepared by Transport Canada in 1985 stated that the impact of airport expansion on the natural environment would generally be of minor significance. There are no existing environmentally sensitive lands in the vicinity of the Airport that would be seriously affected by the current operations or further development of the Airport.

These findings were generally confirmed in a later study undertaken in 1994 by Gartner Lee. The study, titled "Environmental Inventories of Five Airport Sites Southern Ontario



Airport Study", concluded that "from a physical perspective, the area surrounding the Airport is relatively insensitive to increased airport development. Basically, because the Airport is situated on fine-grained soils, there are no subsurface pathways that could allow contaminants generated by airport activities to migrate off-site. The unconfined aquifers contained in the deltaic sands located west and north of the site are generally far enough removed from the Airport, and up gradient of the site so as not to be affected by airport activities." The study further concludes that: "none of the environmental features immediately adjacent to the site are prohibitive to site expansion".

However, awareness of sustainability has grown with respect to the importance of maintaining natural areas, wildlife corridors and buffer zones as key elements for current and future generations. Sustainable development strategies, which allow development to co-exist with the natural environment, are seen as important steps to creating a sustainable society.

With respect to air quality, the 1994 study found that the air quality measurements taken from Ministry of Environment monitoring stations within the vicinity of the Airport were "typically well within applicable criteria at these monitoring stations." The impacts of potential airport-related development have been considered in previous environmental studies. These studies have concluded that:

- No clearing of major forested areas would be required for any future airport expansion. The impact of future development on existing vegetation patterns is considered minor.
- Future expansion of Hamilton International Airport could have a moderate impact on the fish habitat associated with two minor headwaters of the Welland River and a lesser impact on the headwaters of Three Mile Creek. The impacts are considered to be moderate since there are numerous headwater streams that provide auxiliary habitat.
- Constraints associated with storm water runoff and the use of aircraft de-icing fluids can be overcome through proper mitigative measures including the use of stormwater control elements such as storage ponds, glycol containment facilities and wetland treatment systems.
- The presence of current agricultural practices on lands surrounding the Airport limits wildlife habitat. The majority of wildlife habitat is located to the west and southwest of the Airport. This area contains agricultural activity interspersed with several woodlots, wooded fence lines, manmade ponds and tributaries.

To ensure that environmental impacts are minimized, it is important that the Airport and its users adhere to appropriate environmental management practices and procedures. Through the adoption and adherence to an environmental management plan, the Airport can respond appropriately to environmental situations as they arise. With respect to the Airport Master Plan Update, there are no significant environmental constraints that would impede further development at Hamilton International Airport. However, sustainable land use strategies will ensure that natural areas are protected.

## 2.5 SURROUNDING LAND USE

Most of the land immediately surrounding the Airport is currently designated Rural or Agricultural, with uses that include mixed farming, sod farms/nurseries, rural residences and rural subdivisions. The two exceptions to this are the Mount Hope Urban Area, designated Residential, and a strip of land that runs adjacent to Upper James Street that has been designated General Commercial.

Much of the lands immediately surrounding the north, west and south of the Airport are subject to the Airport Employment Growth District Secondary Plan prepared by the City of Hamilton. Under this Plan, much of the land use will be converted to urban land uses which are compatible with the Airport's long term operation and sustainability.

### 2.5.1 City of Hamilton Airport Employment Growth District

In 2003, the City of Hamilton initiated the *Growth Related Integrated Development Strategy* (GRIDS) study. The purpose of the study was to identify a broad land use structure and economic development strategy that would guide the City's growth over the next 30 years. From that study, lands surrounding the Airport were identified as a preferred area to expand the City's employment opportunities and support population growth. The City of Hamilton then designated this area the *Airport Employment Growth District* (AEGD) and subsequently commissioned a number of studies which focused on the Airport's role as a strategic economic generator and stimulus for regional employment; with surrounding lands developed in a manner that is compatible with the Airport's operation. Such proposed uses include:

- Light Industrial
- Warehousing/distribution
- Transportation
- Offices/Prestige Office Parks
- Airport-Related Commercial such as hotels, convention centres, business centres, and car rental facilities

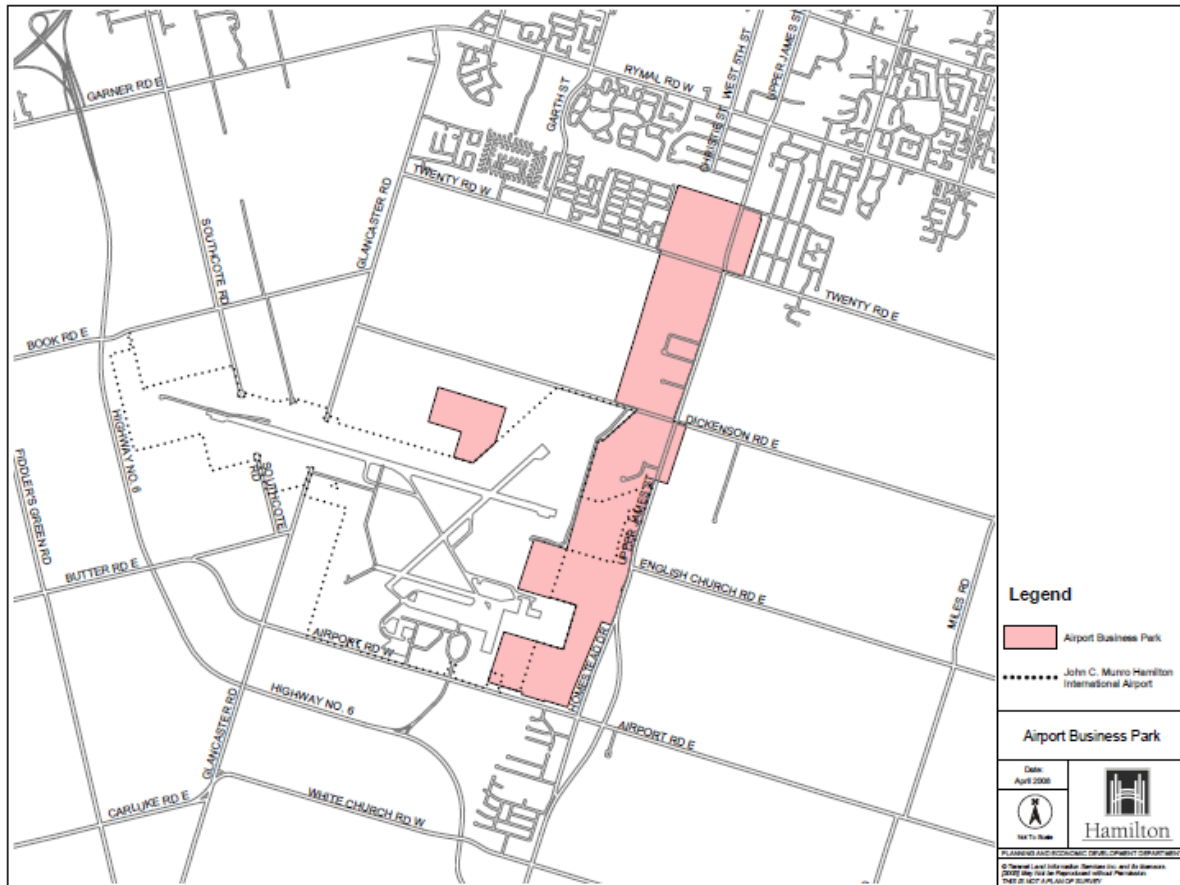
Lands located immediately adjacent to the Airport with the potential for airside access are to be designated Airport-Related Business (ARB). ARB lands will focus on businesses which potentially have a need for airside access. These would include freight forwarders, courier facilities, warehousing and transportation uses.

The analysis associated with the AEGD culminated in the preparation and approval of Secondary Plans for the area and amendments to the City's Official Plan. The extent of the AEGD is illustrated in Figure 2.3

.



**Figure 2.4 Airport Business Park**



Source: City of Hamilton



## 3.0 Airport Activity

### 3.1 REGIONAL POPULATION AND ECONOMIC ACTIVITY

The City of Hamilton covers an area of 113,710 ha. (430 sq. miles). In 2006, the total population of the city was 504,559. This represents an increase of 3.6% over the 1991 figure. The following table provides a description of the population breakdown within the city as of 2001.

<b>Table 3.1 City of Hamilton Population</b>			
<b>Community</b>	<b>2001</b>	<b>2006</b>	<b>% change from 1996</b>
Ancaster	27,485	33,232	17.4 %
Dundas	24,394	24,702	5.5%
Flamborough	37,796	39,220	11.0%
Glanbrook	12,145	15,293	15.0%
Hamilton	331,121	329,820	2.7%
Stoney Creek	57,327	62,292	5.5%
<b>Total for City of Hamilton</b>	<b>490,268</b>	<b>504,559</b>	<b>4.8%</b>

Source: Statistics Canada, 2001 and 2006 Census

It is projected that the population of The City of Hamilton will grow to 590,000 by the year 2021 and 660,000 by 2031<sup>4</sup>. This represents an increase of 17% and 30.8% respectively over the 2006 population figures. With respect to distribution within the area, it is anticipated that much of the growth will occur outside of the former Municipality of Hamilton, reflecting the limited supply of vacant land, which is zoned or designated for residential use. Areas expected to experience substantial increases in population include Ancaster, Waterdown, Flamborough, and Stoney Creek.

#### 3.1.1 Labour Force

The City of Hamilton's projected resident labour force is estimated to increase by 30% from 230,000 in 2011 to 300,000 by the year 2021.<sup>5</sup>

### 3.2 AIR TRANSPORTATION TRENDS

In recent years, the air transportation industry has been significantly impacted by a number of factors which have ultimately led to a recent decline in demand for air travel. In 2009, passenger traffic at Canadian airports declined by approximately 5.4 percent<sup>6</sup>. This was the first decline recorded since the September, 2001 attack on the World Trade Centre.

<sup>4</sup> Growth Outlook for the Greater Golden Horseshoe, January 2005, Hemson Consulting

<sup>5</sup> Growth Outlook for the Greater Golden Horseshoe, January 2005, Hemson Consulting

<sup>6</sup> Air Carrier Traffic at Canadian Airports 2009, Statistics Canada

The most significant factor influencing the air transportation was the global financial crisis initiated in late 2008, which resulted in a major downturn in the world economy and plummeting consumer confidence. Other factors which have impacted the aviation industry include an unprecedented increase in fuel costs, concerns about H1N1 flu virus, and changes to document requirements for passengers travelling to/from the United States.

In 2010, the aviation industry is reflecting a more positive note with passenger activity on the rise and major Canadian air carriers indicating a return to profitability. The Conference Board of Canada forecasts that the Canadian airline sector will have pre-tax profit totalling \$192-million in 2010; a big turnaround from the combined losses of \$381-million last year. This optimism may be somewhat dampened as economic indicators suggest economic recovery, particularly in the US and Europe, is occurring at a slower pace than expected and that consumer confidence and spending still remain low. Transport Canada in its 2009 Aviation Forecast suggests that once the economy recovers it is anticipated that the domestic sector passenger activity will grow at an annual rate of approximately 2.9 percent over the forecast horizon<sup>7</sup>.

Historically, air cargo activity has been strongly correlated to the country's economy. The amount of air cargo in Canada has increased from just less than 800,000 tonnes in 1997 to over 1,600,000 tonnes in 2007, an average increase of approximately 5.6 per year.

Although air cargo activity declined in 2008 and 2009, it is anticipated that with economic recovery there will be an increase in the amount of cargo shipped by air. Transport Canada forecasts that in the short term cargo activity will grow by approximately 2 percent per year and that this will increase to approximately 4 percent per year in the longer term. By 2022 it is anticipated that air cargo shipment will reach 2,865,600 tonnes<sup>8</sup>.

### 3.2.1 Hamilton International Airport Trends

With respect to Hamilton International Airport, there have been several developments which have impacted air carrier activity in recent years. The most significant was the reduction of service by WestJet in early 2004. In order to compete directly with Air Canada in the GTA market, WestJet moved over 60% of its flights to Toronto's Pearson International Airport. In 2010 WestJet reduced its operations at hi on a seasonal basis. The Airport was also impacted by the termination of operations by Globespan Airways in 2009. The Scottish-based airline had operated seasonal charters flights from Hamilton to the United Kingdom. Ultimately, these reductions in airline operations have reduced forecasted growth for the Airport, resulting in the postponement of proposed expansions to the airport terminal building.

Despite the global trend of reduced cargo activity, hi was able to increase total cargo business during the economic downturn by shifting market share from Pearson with DHL and Canada Post moving their operations to hi.

<sup>7</sup> Aviation Forecast, Transport Canada, 2009

<sup>8</sup> Aviation Forecast, Transport Canada, 2009

### 3.3 AIRPORT ACTIVITIES / FORECASTS

#### 3.3.1 Aircraft Movements

In 1988 there were approximately 141,000 annual aircraft movements at Hamilton International Airport. Since then, there has been a general decline in activity such that in 2009 there were approximately 42,000 annual movements. This significant decline in traffic is the largely the result of a sharp reduction in the number of local movements. These local movements are generated primarily from flight training and recreational flying - two areas of general aviation that have been badly hit by the economic downturn and high fuel prices. The introduction of landing fees for general aviation aircraft in 2004 had a significant impact on recreational flying and flight training. In 2008 Peninsulair, a flight training and aircraft rental operation ceased its operations at the Airport. This had a further impact in the reduction of local movements.

While local movements have declined, itinerant movements have remained generally stable. Within the itinerant group, there has been a steady increase in the number of air carrier movements - indicative of HI's emerging role as an air cargo / air carrier airport. Figure 3.1 illustrates historical movements at Hamilton International.

**Figure 3.1 Historical Aircraft Movements**

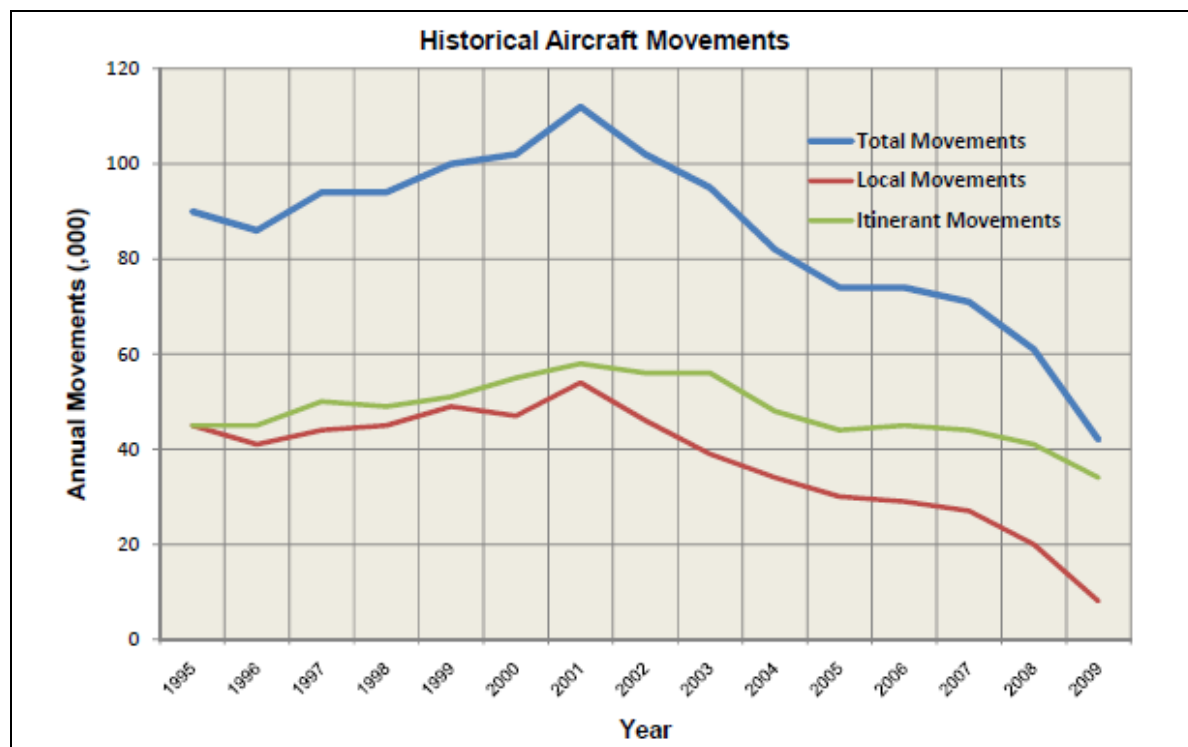


Table 3.2 indicates the projected growth in itinerant aircraft movements for Hamilton International, as identified in the *John C. Munro Hamilton International Airport Air Traffic Forecast* prepared by InterVISTAS Consulting Inc. in February 2008.

Table 3.2 Aircraft Movement Forecast				
Year	Passenger	Cargo	Other	Total
2015	11,800	15,900	27,200	54,900
2020	13,800	17,400	29,100	60,300
2025	15,800	18,600	31,000	65,400
2027	16,200	19,200	31,800	67,200
Source: John C. Munro Hamilton International Airport Air Traffic Forecast, InterVISTAS Consulting Inc. 2008				

Given the recent declines in both itinerant and local movements, and the slow economic recovery it is possible that the projections provided by InterVISTAS for the short-term (2010 – 2015) may be optimistic. The potential return of flight training operations to hi in the near future would likely increase the number of local movements. However, it is unlikely that recreational flying will return to previous levels as the Airport is not best suited to the needs of these users.

### 3.3.2 Passenger Traffic

Passenger movements at Hamilton International have historically been tempered by the fact that Lester B. Pearson, the primary gateway to North America, is less than an hour's drive from hi. Although the population base of the City of Hamilton is about 15% of Toronto's, the Airport draws from a catchment area that contains 4.2 million passengers per year.

Since WestJet arrived in 2000, the Airport implemented an aggressive plan to develop hi as a hub for their domestic operations. The public showed support for these services with passenger volumes (connecting and originating) surpassing one million in 2003. The growth of hi was unprecedented in Canadian airport history. The merging of Air Canada and Canadian in 2003 resulted in an opportunity for WestJet to shift their eastern hub to Lester B. Pearson International Airport. The strategic shift by WestJet resulted in a substantial decline in passenger traffic at hi beginning in 2004; passenger activity had dropped by over 40% to approximately 595,000 annual passengers.

Until 2007, international activity accounted for less than 3 percent of total passengers volumes. With the introduction of FlyGlobespan in 2007, international activity increased to approximately 22%, making up for some of the loss of domestic traffic. FlyGlobespan introduced 21 weekly flights to 12 UK destinations, drawing traffic from the entire catchment area. This reinforced public support for hi as a secondary gateway to the Southern Ontario region. With the demise of Globespan in 2009, international passenger activity again declined.

Figure 3.2 describes the historical passenger activity at Hamilton International Airport.

**Figure 3.2 Historical Passenger Volumes**

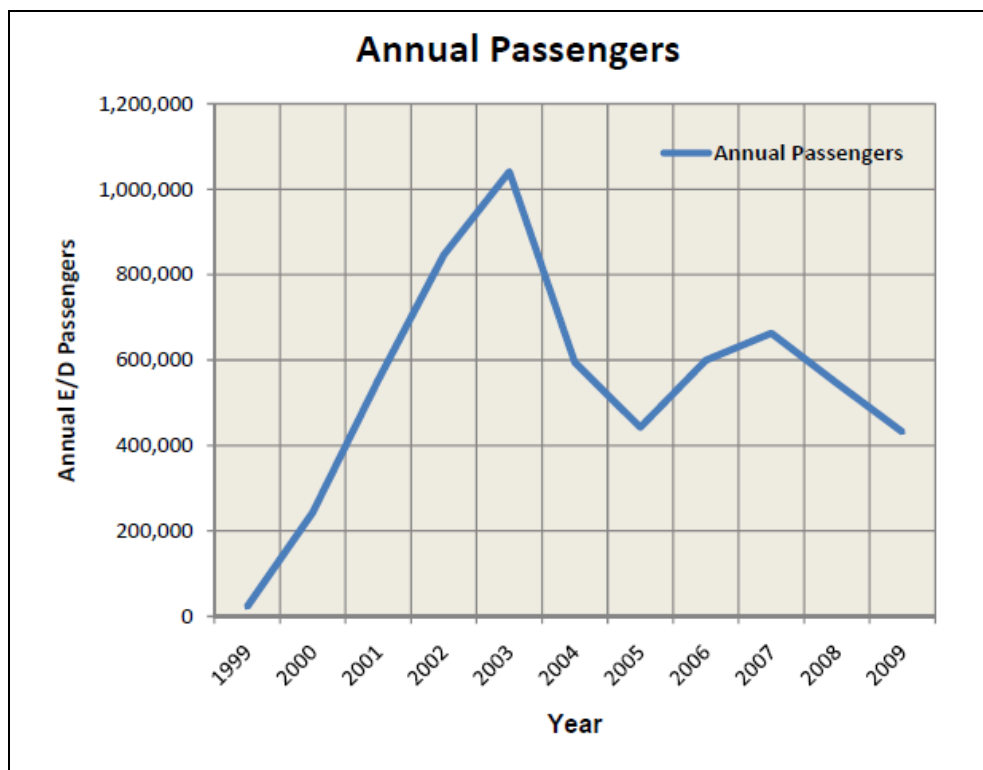


Table 3.3 indicates the projected E/D passenger forecasts for Hamilton International, as identified in the *John C. Munro Hamilton International Airport Air Traffic Forecast* prepared by InterVISTAS Consulting Inc. in February 2008.

<b>Year</b>	<b>Domestic</b>	<b>International</b>	<b>Transborder</b>	<b>Total</b>
2007	504,000	148,000	11,000	662,855
2012	647,000	203,000	27,000	877,000
2017	768,000	255,000	67,000	1,090,000
2022	896,000	312,000	80,000	1,288,000
2027	1,030,000	373,000	93,000	1,496,000

Source: John C. Munro Hamilton International Airport Air Traffic Forecast, InterVISTAS Consultants, 2008

The forecast generated by InterVISTAS suggests that domestic traffic will grow at an average of approximately 3.6% per annum and will likely reach the peak 2003 level by 2027, the end of the forecast horizon.

International traffic, which has decreased in recent years because of the termination of the FlyGlobespan operation is projected to grow by 5.6 %and 4.7% per annum over the next ten and twenty years respectively. This traffic is expected to be from growth in both scheduled services and seasonal charter services to sun destinations.

The 2008 Air Traffic Forecast anticipates that in the short to medium term, transborder activity will be comprised of charter flights to sun destinations, but that by 2017 regular scheduled service could be established to a number of US cities.

### 3.3.3 Air Cargo / Courier Traffic

In recent years, Hamilton International has taken on a significant role as an air cargo/courier airport. Major courier operators that are currently active at the Airport include UPS, Purolator, DHL, and Cargojet. At present, there are approximately 40 air cargo flights a day to/from Hamilton International. These flights utilize aircraft ranging in size from small turboprops to the large B767-200s and DC-10s.

With respect to air cargo/courier activities, the Airport serves not only the needs of the region, but also serves as a gateway to Canada with Purolator and Cargojet operating their domestic hubs from hi.

Table 3.6 illustrates the historical growth of air cargo activities since 1990 based on the combined annual maximum takeoff weight (MTOW) of cargo/courier aircraft. It is anticipated that hi will continue to experience a robust growth in the future. In the *Hamilton Airport Strategic Study* courier activities at Hamilton were forecast to grow to 200,000 tonnes by the year 2020, and general air freight was projected to increase to 311,000 tonnes.

With the downturn in the world economy, air cargo activity in Canada has generally declined by approximately 4.8% and is expected to make a slow recovery as the economy improves. Between 2008 and 2022, Transport Canada has forecast<sup>9</sup> domestic air cargo to grow by 3.4%, transborder by 4.6%, and international by 4.8%. Transport Canada also forecasts that domestic air cargo will generally decline in importance while international and transborder activity will increase. It is projected that during the 2008 - 2022 period, domestic air cargo activity will account for 37.9% of the total activity while transborder and international will account for 26% and 33% respectively.

<sup>9</sup> Aviation Forecast 2008-2022, Transport Canada, 2009

<b>Table 3.4      Air Cargo Activity</b>	
<b>YEAR</b>	<b>MTOW (,000 kg)</b>
1999	355,832
2000	360,230
2001	367,136
2002	365,453
2003	327,161
2004	292,028
2005	289,067
2006	290,110
2007	347,040
2008	371,685
2009	372,702
2010	416,000 (Est.)
Source: Hamilton International Airport Limited	

The future expansion of cargo activities at hi is predicated on a number of important factors which need to be supported in the ongoing development of the Airport. These factors include:

- Sufficient land on which to expand cargo handling/sortation facilities and development of multi-tenant cargo facilities to support freight forwarder growth.
- Good ground transportation access to major markets.
- Improved reliability during poor winter weather through extension of runway 06-24.
- Competitive operating costs.

### **3.3.4 General Aviation**

General aviation, which historically has been one of the primary activities at Hamilton International, encompasses the activities of private, government, business and commercial sectors of civil aviation, excluding the scheduled and charter activities of air carriers. In the context of Hamilton International, the definition of general aviation also excludes scheduled air cargo / courier activities.

General aviation activities at Hamilton International Airport currently include corporate and business aviation, fixed base operators, air charter, and aircraft servicing. Although no flight training is currently undertaken at the Airport, it is anticipated that a local college will initiate a flight training program in the very near future. The activities of the Canadian Warplane



Heritage Museum are included under general aviation. At present, there are approximately 150 general aviation aircraft based at the Airport.

As the Airport continues to attract heavier, commercial aircraft operations, many recreational aircraft operators have chosen to relocate their operations to smaller, less congested airfields such as Niagara Falls Airport, Brantford Airport and Burlington Airpark which offer inexpensive tiedown positions and opportunities for owners to construct small hangars.

Transport Canada's national forecast growth rates suggest that the private and recreational component of general aviation activity will continue to decline at a rate of 1 - 2.6% per annum over the next 10 years, while the commercial component will grow at a modest 1 - 1.2% per annum.

Hamilton International has created a development plan that will permit construction of general aviation facilities on the west side of the Airport. This will allow separation of commercial and general aviation activities.

### **3.4 LONG RANGE AIRPORT CAPACITY ANALYSIS**

As part of the 2004 Airport Master Plan, a long range airfield capacity analysis was completed. This analysis which continues to be relevant is an estimation of future airfield capacity and takes into consideration the existing and planned runway / taxiway configuration. In order to maximize the capacity of the existing airfield, it was assumed that Runway 06-24 would be extended to 2,743 m in length and parallel taxiways were added to both runways.

The long range airfield capacity of Hamilton International is dependent on several factors:

- Fleet or aircraft mix; (small, single engine aircraft vs. large, multi-engine aircraft)
- Runway / taxiway configuration;
- Weather (VFR / IFR operations);
- Number of runway exits;
- Location of runway exits;
- Estimated touch and go operations;
- Arrival / departure ratio;

The future mix of aircraft is the most significant factor in determining future airfield capacity. It is assumed that by 2024, general aviation will represent a very small portion of the mix of aircraft, and 90% of aircraft traffic will be medium to large aircraft such as the Dash 8, Boeing 737, Airbus 320, Airbus 330 and Boeing 747.

These factors were used to calculate the 'Annual Service Volume'; the number of aircraft operations that the airfield configuration is capable of supporting. The same factors were also used to calculate the maximum hourly capacity of the airfield.

When parallel taxiways are constructed for each runway and Runway 06-24 is expanded to 9,000 feet in length, the IFR (Instrument Flight Rules – poor weather) capacity has been calculated to be approximately 51 movements per hour. Under the same circumstances, future VFR (Visual Flight Rules – good weather) capacity is calculated to be approximately 70 movements an hour.

The airfield capacity analysis suggests that the total future capacity of the airfield is approximately 265,000 aircraft operations per year. This is well beyond the aircraft movement projections identified in the 2008 Air traffic Forecast prepared by InterVISTAS.

## 4.0 Assessment of Existing Facilities

### 4.1 AIRSIDE INFRASTRUCTURE

Hamilton International's present airside infrastructure consists of two runways, associated taxiways and aprons. These aircraft maneuvering areas are illustrated in Figure 4.1 on the following page.

Under the 1995 Southern Ontario Area Airport Study (SOAAS)<sup>10</sup>, Transport Canada identified that Hamilton International has an annual capacity of 140,000 IFR (Instrument Flight Rules) movements or 426,000 VFR (Visual Flight Rules) movements. Compared against Transport Canada's 2017 forecast of 156,000 movements, this would suggest that within the horizon of the Airport Master Plan, hi should not have an airside capacity problem. To achieve these capacities, however, a parallel taxiway for Runway 12-30 would be required. Table 4.1 identifies the aircraft movement performance standards that were identified as part of the SOAAS study.

<b>Table 4.1 Aircraft Movements Per Hour</b>				
<b>Approach Facility</b>	<b>Max Arrivals Only</b>	<b>Max Departures Only</b>	<b>50% ARR &amp; 50% DEP</b>	
			<b>Practical Capacity</b>	<b>Absolute Capacity</b>
ILS & LOC (BC)	12.2	30.5	16.7	24.4
NDB Straight-In	12.2	31.2	16.5	24.1
IFR Capacity during VMC	17.3	30.5	26.7	34.4
Total VFR Capacity	41.2	52.5	54.8	62.3
Multi RWY VFR Capacity	67	73.2	91.6	102.6
Source: Air Traffic Capacity Analysis, Southern Ontario Area Airports Study, Transport Canada, 1995				

In the SOAAS study, Transport Canada identified that the most significant capacity-limiting factor at Hamilton International is the lack of a full parallel taxiway system on both Runways 06-24 and 12-30. The requirement for backtracking increases runway occupancy times and forces air traffic controllers to increase aircraft separations.

In the case of arrivals, a normal separation of 5 nautical miles (nm) increases to 10 nm for turboprop and smaller aircraft. Even further increases in separation are required for jet aircraft because of the longer runway occupancy times that occur because of the increased backtracking distances.

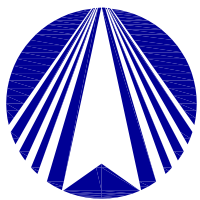
<sup>10</sup> Southern Ontario Area Airports Study, Transport Canada, 1995





BUILDINGS/FACILITIES INDEX

NO.	DESCRIPTION
01	AIR TERMINAL BUILDING
02	FORMER FEDEX BUILDING #1
03	FORMER FEDEX BUILDING #2
04	EMPLOYEE PARKING LOT
05	PRIMARY PARKING LOT
06	CWHM
07	ONTARIO FLIGHTCRAFT
08	PUROLATOR COURIER
09	TRANSPORT CANADA
10	JETPORT FBO
11	BELL COMMUNICATIONS BUILDING
12	AIC
13	HANGAR 2
14	CARGOJET HANGAR 3
15	GLANFORD AVIATION
16	HANGAR 5
17	FORMER GLANFORD MAINT. BLD.
18	ATB PUMP HOUSE
19	UPS
20	DHL
21	CARGOJET
22	ORNGE
23	WJ PUMPHOUSE
24	HAFFC FUEL FARM
25	UPS SWM POND
26	ABANDONED DF SITE
27	RAMP RADAR
28	RUNWAY 12 LOCALIZER
29	RUNWAY 30 LOCALIZER
30	RUNWAY 12 GLIDE PATH
31	RVR - A
32	TRANSMITTER SITE
33	FIELD ELECTRIC CENTRE (FEC)
34	RVR - B
35	COMBINED SERVICES BUILDING (CSB)
36	AWOS
37	ATCT
38	RECEIVER SITE
39	FIRE TRAINING AREA
40	CELL TOWER



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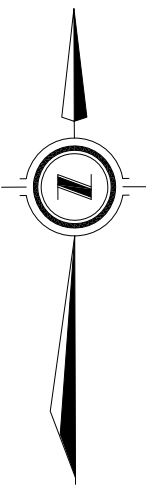
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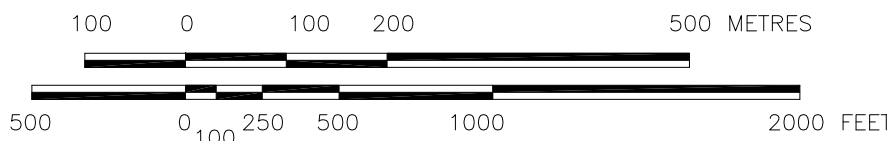
No.	Description	By	Appd.	Date
0	FIRST DRAFT	JJH	GB	DEC-2010
1	FINAL REPORT	JJH	GB	APR-2011

Notes

- FOR PLANNING PURPOSES ONLY.
- EXISTING AIRPORT PAVEMENTS BASED ON THIRD PARTY DATA.
- DRAWING SHOWN IN UTM PROJECTION NAD27 ZONE 17.
- RUNWAY STRIP AND APPROACH SURFACES BASED ON TP312 4TH EDITION.
- BUILDINGS, ROADS AND TOPOGRAPHICAL FEATURE LOCATIONS ARE APPROXIMATE ONLY - BASED ON THIRD PARTY INFORMATION.



SCALE 1:7500  
ON 24"x36" (ARCH D)



GENERAL LEGEND

- EXISTING STRUCTURE / BUILDING
- EXISTING AIRSIDE PAVEMENT
- EXISTING AIRPORT BOUNDARY
- EXTENDED RUNWAY CENTRELINE
- EXISTING LEGAL BOUNDARY
- EXISTING ROAD

Client/Project

HAMILTON INTERNATIONAL AIRPORT  
20 YEAR MASTER PLAN UPDATE

Hamilton, ON

Title

FIGURE 4.1  
HAMILTON INTERNATIONAL AIRPORT  
EXISTING CONDITIONS

Designed by: JJH	Scale: 1:7500 (24X36 SHEET)	
Own by: JJH	Reviewed by: GB	Project No.
Revision: 1	Drawing No: FIG 4.1	06349



In the case of departures, the requirement to backtrack aircraft to the departure threshold reduces the departure rate from approximately 30 movements an hour to a range of 15 to 20 departures depending on the traffic mix.

Although the existing delays are minimal, potential capacity problems could arise during times associated with the arrival and departure of courier aircraft. This is because the larger jet aircraft require runway lengths that increase the need for backtracking both on departure and arrival. With most of the courier activity occurring at night, the provision of appropriate separations between aircraft is a major safety concern that must be considered.

Based on ICAO planning standards, the provision of parallel taxiways should be considered when peak hour itinerant movements exceed 20 or when annual movements exceed 50,000. Given the forecasted aircraft movements identified in Table 3.2, a parallel taxiway would be required by 2015.

#### 4.1.1 Runways

Two runways presently serve Hamilton International – 06-24 and 12-30. The runways are described in the following text and summarized in Table 4.2.

<b>Table 4.2 Summary of Runway Pavements</b>				
<b>Location</b>	<b>Operation</b>	<b>PCI</b>	<b>PLR</b>	<b>General Comments</b>
06-24	1829 m x 45m 6000ft x 150ft	45	9	Unsatisfactory with low to high severity alligator cracking, low to high severity longitudinal and transverse cracking
12-30	3,138 m x 60m 10,297 ft x 200 ft	61	11	Marginal condition with longitudinal and transverse cracking. Heavily trafficked centre sections unsatisfactory with alligator cracking
PCI = Pavement Condition Index, a common parameter used to quantify the amount and severity of cracking visible in the pavement surface. It is based on a scale of 0 – 100 with 100 being no cracking. The JEGEL report indicates 55 to 70 being marginal and below 55 as being unsatisfactory.				
PLR = Pavement Load Rating and refers to Transport Canada indicator of pavement strength. The JEGEL report indicates that the minimum PLR required for Hamilton International Airport is 9.				
Sources: Airside Pavements Evaluation Hamilton International Airport, JEGEL, 2006 Recommendations for Airside Pavement Rehabilitation, Jacques Whitford, 2008				

#### Runway 12-30

Runway 12-30 is 3,138 m (10,297 ft.) long by 60 m (197 ft) wide and is certified to Transport Canada Standards and Recommended Practices for a Code 4E, instrument,

precision runway. Originally constructed in 1986, the entire runway surface was rehabilitated in the summer of 1997, providing an Pavement Load Rating (PLR) rating of 12. The rehabilitation work included the milling and removal of portions of existing asphaltic concrete and replacement with new materials. The work was undertaken because of problems resulting from the pavement being overstressed by heavy aircraft usage. The runway was extended in the NW and SE directions in the summer of 1999 by a total of 700m. The approach to Runway 12 is equipped with a full CAT II instrument landing system.

Based on a pavement survey undertaken in 2006, there are areas where low to medium severity alligator cracking and transverse cracking has been noted. These areas need repair/maintenance so that further water does not infiltrate the pavement structure.

Since Runway 12-30 was extended in 1999 the Boeing 727-200 is no longer the critical sized aircraft at the Airport. However, it continues to be the most critical aircraft in regular use at the Airport due to the considerable stress it affects on the aging pavement structure. The following table represents the current mix of heavy aircraft in use at Hamilton International.

<b>Table 4.3 Heavy Aircraft Currently in Use</b>	
<b>Tenant</b>	<b>Typical Aircraft Used</b>
UPS	B757-200
Purolator	B727-200 / DC10-30
CargoJet	B767-200 / B757-200 / B727-200
WestJet	B737-600 / B737-700
DHL	DC8-73

Table 4.4 provides runway length requirements for various cargo and passenger aircraft that may be considered as potential operating aircraft.

<b>Table 4.4 Runway Length Requirements</b>		
<b>Aircraft</b>	<b>Runway Length (m) (Standard Day @ Sea Level, Gross Takeoff Weight)</b>	
	<b>Take Off</b>	<b>Landing</b>
A300-200	2,850	1,635
B727-200	3,033	1,494
B747-400	3,170	1,910
B757-200	2,245	1,460
B767-300	2,620	1,615
L1011-500	2,636	2,073
DC 10-30	2,996	1,820
MD-11	3,078	1,972



Note: The Airport's elevation of 238 m above sea level will increase runway length requirement from those figures noted in Table 4.4 by approximately 5%.

The Airport Master Plan Update prepared in 2004 confirmed that the recommendations of the 1999 Master Plan had been met with respect to increasing the length of runway 12-30 to a length of 3,048 m (10,000 ft.). Due to hydro lines located 700 m to the west of Runway 12 there is a 487 m displaced threshold on Runway 12. Similarly there is a 122 m displaced threshold on Runway 30. Although the Take-off Run Available (TORA) is not impacted, these threshold displacements reduce the Landing Distance Available (LDA) to 2,560 m for Runway 12 and 2,926 m for Runway 30. To accommodate long-haul international cargo flights with large aircraft such as the Boeing 747-400F a TORA of approximately 3,352 m (11,000 ft.) would be required.

### **Runway 06-24**

Runway 06-24 is 1,829 m (6,000 ft.) long by 45 m (150 ft.) wide and is certified as a Code 4 instrument, non-precision runway. The runway was constructed in 1940 as part of the Airport's original development and was subsequently expanded in the 1950's to its present length. The runway presently has a PLR of 9.

In the past, the runway was equipped with CAT I instrument approaches; however this equipment was removed after the completion of Runway 12-30. At present, Runway 06 is certified for non-precision approaches only.

Runway 06-24 is the preferred runway orientation with respect to prevailing winds. This is especially true during bad weather when storm winds are out of the northeast. Hamilton International has development plans to extend 06-24 to 9000ft in length, install an instrument landing system, and have the runway upgraded to accommodate heavier aircraft. This work will be undertaken as traffic demand warrants.

The southern third of the runway requires extensive reconstruction. The northern third is also in need of immediate attention. The runway requires an improved drainage system, consistent pavement structure, increased Pavement Load Rating, a precision instrument approach, and new centre-line and edge lighting.

### **4.1.2 Taxiways**

Hamilton International is provided with a limited system of taxiways that provide access from the various aprons to the runway system. Table 4.5 provides a general description of the existing taxiway system.

**Table 4.5 Description of Taxiways**

<b>Taxiway</b>	<b>Width (m)</b>	<b>Function</b>	<b>PCI</b>	<b>PLR</b>	<b>Condition</b>
Alpha		Access from Apron 1 to Taxiway Bravo.	93	13	Adequate condition with minor localized distresses.
Bravo		Access to/from the threshold of Runway 06.	**	**	Resurfaced in 2008
Charlie		Access to/from Runway 12-30.	45	12	Marginal to unsatisfactory with medium to high severity alligator cracking and rutting along with longitudinal and transverse cracking.
Delta		Provides access to commercial development including Flightcraft, Jetport and Transport Canada	**	**	Resurfaced in 2008
Golf	23	Parallel to Runway 12-30 Golf provides extended access to the runway from Taxiway Charlie	33	9	Poor condition, with low to high severity alligator cracking, low to medium rutting throughout.
Hotel	23	Parallel to 6-24, provides extended access to the runway from Taxiway Charlie	18	7	Suitable only as holding position for Class A aircraft. Taxiway should be abandoned due to its low strength and degraded condition.
Juliet	23	Provides access to UPS apron and expanded terminal apron and Canadian Warplane Heritage Museum	80	12	Good condition with low severity transverse cracking and reflection cracking
Whiskey	23	Provides access from Charlie to commercial developments located on east lands. (WestJet, Cargojet)	100	13	Constructed in 2002. Good condition. Suitable for Code E aircraft.
<p>PCI = Pavement Condition Index, a common parameter used to quantify the amount and severity of cracking visible in the pavement surface. It is based on a scale of 0 – 100 with 100 being no cracking. The JEGEL report indicates 55 to 70 being marginal and below 55 as being unsatisfactory.</p> <p>PLR = Pavement Load Rating and refers to Transport Canada indicator of pavement strength. The JEGEL report indicates that the minimum PLR required for Hamilton International Airport is 9.</p> <p>** PCI and PLR have not been re-evaluated since airside pavement evaluations undertaken.</p>					
<p>Sources: Airside Pavements Evaluation Hamilton International Airport, JEGEL, 2006 Recommendations for Airside Pavement Rehabilitation, Jacques Whitford, 2008</p>					

With the exception of Runway 06, none of the runway thresholds are directly served by taxiways. The lack of direct access to the thresholds places constraints on the overall capacity of the Airport. Similarly, the capacity of Runways 12-30 and 06-24 would be improved with the provision of high-speed exits. High-speed exits would reduce occupancy times and eliminate the need for aircraft to backtrack on the runway.

The limited taxiway system also imposes constraints on the movement of aircraft to and from the runway system. Flows of arriving and departing aircraft are often required to use the same taxiway and aircraft are often required to use portions of the runway system as taxiways.

Development of courier and other facilities in close proximity of the terminal area will place increased demands on the use of Taxiway Charlie as the primary taxiway for large aircraft. With future increases in activity there is the potential for congestion and delays associated with the dependent two-way movement of aircraft along Taxiway Charlie. To alleviate potential congestion and delay, an alternative means of access should be provided from Runway 12-30 to the apron area that will allow independent movement of aircraft. During low visibility operations a practice of 'one-in, one-out' is required to ensure the safe separation of aircraft maneuvering on the taxiways. Again, to alleviate these constraints, a taxiway system supporting the dependent two-way flow of aircraft is required. To accommodate low visibility operations taxiway centerline lighting should be introduced as taxiways are constructed or reconstructed.

#### **4.1.3 Aprons**

The Airport is provided with a number of aprons that are associated with the terminal building, the old hangar flight line and a number of other commercial developments. Previously, the lack of adequate apron space at the terminal building led to congested conditions and posed potential safety related problems. In 1997, new aircraft parking aprons were constructed immediately east of the existing terminal apron and over portions of former Runway 12R-30L, (now referred to as Taxiway Lima). UPS as part of their new sortation facility constructed these aprons. The new UPS apron has the capacity to accommodate approximately 7 Code C (narrow body aircraft such as the B727) aircraft.

In 2002 apron expansion to the west provided an additional 33,385m<sup>2</sup> (8.2 acres) with capacity to handle 9 – B737 aircraft or 7 – B767 aircraft. The eastern portion of this apron allows for aircraft deicing whereas the western portion does not.

In 2003 an additional 7,803 m<sup>2</sup> (1.9 acres) apron was constructed as a precedent to the anticipated northerly expansion of the Air Terminal Building.

A summary of the existing apron pavements is provided in Table 4.6 below.

**Table 4.6 Summary of Apron Pavements**

Location	Operation	PCI	PLR	General Comments
Apron I	Frontal to the Air Terminal Building (ATB)	46	11	Fair to good condition. A portion of this will be lost once the ATB is expanded to the north
Apron III	East of the terminal area between UPS and CWHM	68	11	Generally good condition, but with deteriorating joints. Constructed in 1998
Apron I Expansion	Foxtrot was eliminated during this construction	85	11	Good condition. Constructed in 2003 to allow ATB to expand to the north
Apron II Total Reconstruction and Expansion	Situated west of the ATB frontal to the old hangar line	96	11	Good Condition. Total reconstruction and expansion in 2002
Apron III	Situated east of the terminal apron, over portions of Runway 12R- 30L	-	11	Good Condition. Constructed in 1997
Canadian Warplane Heritage Museum Apron	Frontal to the CWHM	-	8	Good Condition. Constructed in 1995
Transport Canada Service Hangar	Frontal to Transport Canada service hangar	-	8	Good Condition. Constructed in 1994
Ontario Flightcraft	Frontal to Ontario Flightcraft hangar	-	11	Good Condition. Constructed in 1995
Jetport	Frontal to JetPort hangar	-	8	Good Condition. Constructed in 1997
WestJet	Frontal to the WestJet hangar	-	11	Good Condition Constructed in 2003
Cargojet	Frontal to the Cargojet hangar	-	-	Good Condition Constructed in 2005
AIC	West of AIC hangar	-	-	Good Condition Constructed in 2005
<p>PCI = Pavement Condition Index, a common parameter used to quantify the amount and severity of cracking visible in the pavement surface. It is based on a scale of 0 – 100 with 100 being no cracking. The JEGEL report indicates 55 to 70 being marginal and below 55 as being unsatisfactory.</p> <p>PLR = Pavement Load Rating and refers to Transport Canada indicator of pavement strength. The JEGEL report indicates that the minimum PLR required for Hamilton International Airport is 9.</p> <p>Sources: Airside Pavements Evaluation Hamilton International Airport, JEGEL, 2006  Recommendations for Airside Pavement Rehabilitation, Jacques Whitford, 2008  Hamilton International Airport</p>				

Additional apron areas to the east of the proposed ATB will also be required during the course of the ATB expansion project. Additional cargo stands and specialized deicing bays have also been identified and may be required when a business case can be brought forward.

#### 4.1.4 Airfield Lighting Visual Aids

Hamilton International is provided with a complement of airport lighting systems that enable it to operate under both night VFR and IFR. The following table provides a summary of the airport lighting and visual aids currently provided at the Airport.

<b>Table 4.7 Summary of Airfield Lighting / Visual Aids</b>		
<b>Lighting Purposes</b>	<b>Runway/ Approach</b>	<b>Lighting Type</b>
Runway	06	Medium intensity edge lighting with threshold and runway end lighting
Runway	24	Medium intensity runway edge lighting with threshold and runway end lighting
Runway	30	High Intensity Runway centre-line /edge lighting
Runway	12	High Intensity Runway centre-line /edge lighting. Touchdown zone lighting.
Approach	6	Centre row low intensity approach lighting (AD). Precision approach path indicator (PAPI)
Approach	24	Runway identification lights (RIL's) Precision approach path indicator system (PAPI)
Approach	12	Cat II high intensity approach lighting. Precision approach path indicator system (PAPI)
Approach	30	Centre row low intensity approach lights. Runway Identification lights. Precision approach path indicator system (PAPI)
Taxiways & Aprons	All	Medium Intensity Edge Lights
Airport Location		Rotating Beacon on top of control tower cab
Wind Speed & Direction Indicators		Lighted wind cones at each end of Runway 12-30 and 6-24

#### 4.1.5 Instrument Navigation/ Landing Aids

A variety of electronic navigation and landing aids are provided at Hamilton International Airport. A summary of these is provided in Table 4.8.

Table 4.8 Instrument Navigation / Landing Aids				
Facility	Identifier Frequency	Function	Location	Remarks
Non Directional Beacon (NDB)	HM 221 kHz	Terminal Approach Aid	4.2 Nautical miles from threshold of Runway 06 on extended runway centerline	Coverage 25 NM
Non Directional Beacon (NDB)	A397 kHz	Terminal Approach Aid	3.7 Nautical miles from threshold of Runway 12 on extended runway centerline	Coverage 25 NM, formerly outer marker "J"
Non Directional Beacon (NDB)	B266 kHz	Terminal Approach Aid	5.7 Nautical miles from threshold of Runway 30 on extended runway centerline	Coverage 25 NM, formerly back beam marker
Localizer	IAB 110.9 MHz	Approach Aid	1000 feet from threshold Runway 24	Category II quality, front course Runway 12. Backcourse Runway 30.
Glidepath	Paired with localizer frequency 110.9 MHz	Approach Aid	1033.5 feet from threshold runway 12 and 492 feet from runway centerline (south side of runway 12)	
Source: Canada Air Pilot, Nav Canada				

Runway 12-30 is the primary runway under Instrument Flight Rule (IFR) conditions, providing precision approaches to the Airport. Under IFR conditions, this runway is used by both the air carriers and by general aviation. Navigational aids associated with Runway 06-24 are used for non-precision approaches and are used primarily by general aviation.

At present, Runway 12 is provided with a Category (CAT) II precision approach. This includes high intensity approach lighting, touchdown zone lighting and centerline lighting. The provision of a CAT II ILS system reduces the percentage of time where the weather conditions would be below minimum limits to approximately 1.27%.



As stated previously, due to prevailing wind conditions, Runway 06-24 is often the preferred runway during IFR conditions. During IFR weather conditions with a 10 knot wind, the percent wind coverage for Runway 06-24 is 93.32 versus 68.59 for Runway 12-30. For a 15 kt. wind the wind percentage coverage for 06-24 increases to 98.17. The provision of an ILS system on Runway 06, along with the extension to 9000ft, would expand the all-weather capability of the Airport especially at times when prevailing winds provide a crosswind component to 12-30 knots.

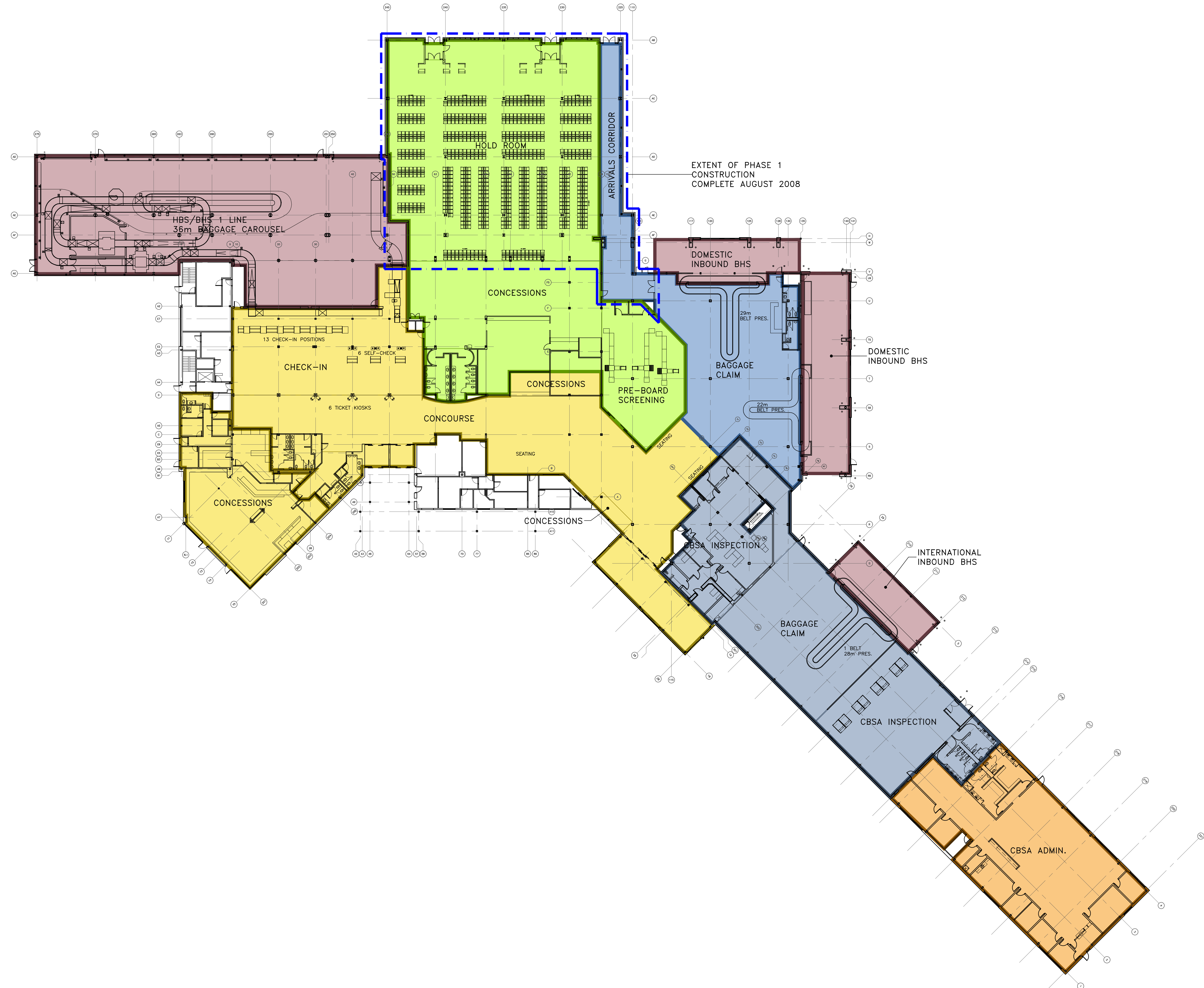
In the future development of the airside, consideration should be given to reintroducing a precision approach system to Runway 06-24.

## **4.2 AIRPORT TERMINAL BUILDING**

The Airport Terminal Building (ATB) at Hamilton International Airport was constructed by Transport Canada in 1985 as a single storey structure with an area of approximately 4,000sm and had a capacity to accommodate approximately 540,000 annual passengers and a one-way planning peak hour passenger (PPHP) capacity of approximately 250. Subsequent additions and major renovations to the facility have increased the capacity of the terminal and accommodated enhanced security requirements. These changes have included:

- 1992 Two- storey addition to west end of building to accommodate airport and airline administration functions.
- 2001 Expansion of Outbound Baggage and Departures Lounge
- 2002 New international arrivals hall, security, customs control and baggage claim added to south east corner of the building.
- 2005 Interior renovations to expand pre-board passenger screening area. Upgrades to interior finishes and furnishings.
- 2006 Expansion of outbound baggage makeup area including a new hold bag screening facility with structural elements designed to accommodate a future second and third storey.
- 2007 Expansion to Canadian Border Services Agency (CBSA) administration and secondary inspection facilities; reconfiguration of International Arrivals; and, expansion of ATB concessions.
- 2008 Holdroom Expansion

A current floor plan of the terminal building is provided in Figure 4.2.



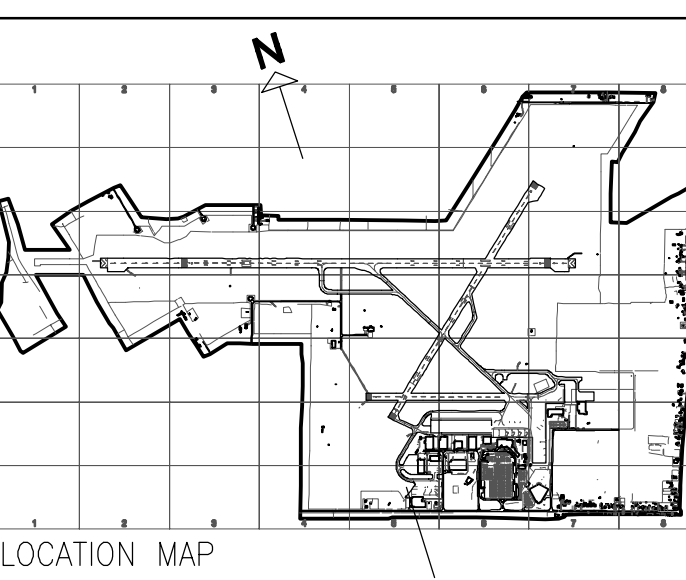
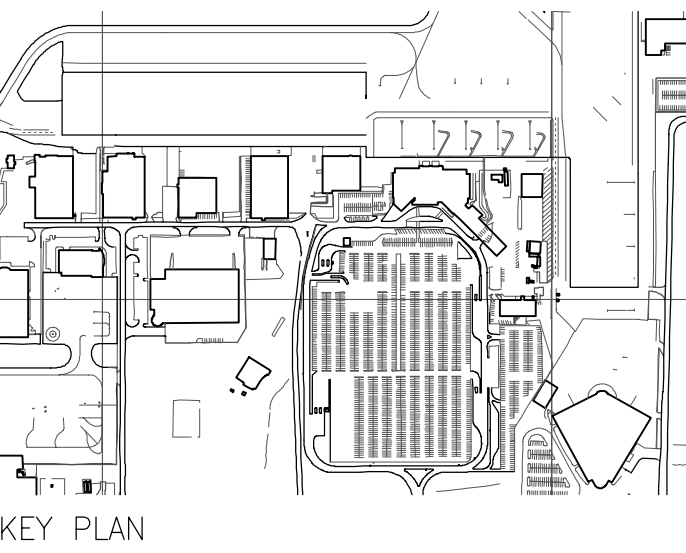
GENERAL NOTES

PROPOSED NET FLOOR AREA:

- PUBLIC CONCOURSE**  
TOTAL FLOOR AREA APPROX. 1829 sq.m
  - CHECK-IN  
FLOOR AREA APPROX. 414 sq.m
  - CONCESSIONS  
FLOOR AREA APPROX. 444 sq.m
  - CONCOURSE  
FLOOR AREA APPROX. 724 sq.m
- BAGGAGE HANDLING**  
TOTAL FLOOR AREA APPROX. 1556 sq.m
  - OUTBOUND  
FLOOR AREA APPROX. 1086 sq.m
  - INBOUND DOMESTIC  
FLOOR AREA APPROX. 359 sq.m
  - INBOUND INTERNATIONAL  
FLOOR AREA APPROX. 111 sq.m
- DEPARTURES**  
TOTAL FLOOR AREA APPROX. 1853 sq.m
  - HOLD ROOM  
FLOOR AREA APPROX. 1069 sq.m
  - CONCESSIONS  
FLOOR AREA APPROX. 474 sq.m
  - PRE-BOARD SCREENING  
FLOOR AREA APPROX. 234 sq.m
- DOMESTIC ARRIVALS**  
TOTAL FLOOR AREA APPROX. 660 sq.m
  - BAGGAGE CLAIM  
FLOOR AREA APPROX. 476 sq.m
- INTERNATIONAL ARRIVALS**  
TOTAL FLOOR AREA APPROX. 1051 sq.m
  - CBSA INSPECTION  
FLOOR AREA APPROX. 520 sq.m
  - BAGGAGE CLAIM  
FLOOR AREA APPROX. 381 sq.m
- CBSA ADMIN.**  
TOTAL FLOOR AREA APPROX. 609 sq.m



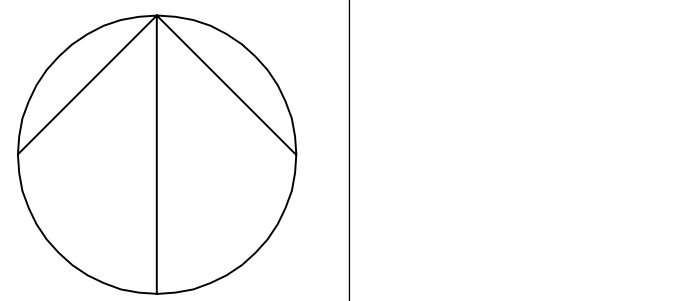
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JUN 11/08	FINAL PDR	C
MAY 29/08	FINAL DRAFT	B
MAY 9/08	PRELIMINARY DRAFT	A

DATE	REVISIONS/ISSUED FOR	REV	BY
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9300 AIRPORT ROAD, SUITE 2206  
MOUNT HOPE, ON, L0R 1W0  
CANADA



PROJECT TITLE  
HAMILTON INTERNATIONAL AIRPORT  
TERMINAL DEVELOPMENT PLAN  
PDR

DRAWING TITLE  
EXISTING  
PHASE 1  
GROUND FLOOR PLAN

PROJECT NO.  
ECBL07-0137

DESIGNED BY  
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MARCH 2008

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The Air Terminal Building in its present state is, approximately 8,500 m<sup>2</sup> in area. Major components of the air terminal building include the following:

### **Check-in Area**

The air terminal building is currently provided with a total of 13 conventional check-in positions and 6 flow-through positions. In addition, 6 self-serve kiosks are located in the check-in hall. This provides a processing capacity of approximately 450 passengers per hour. Constraints associated with the existing check-in area include its narrow depth, which results in lack of passenger queuing space, and poor passenger circulation space which results in congestion and cross flows of pedestrian movement.

### **Pre-board Passenger Screening**

Currently there is provision for three screening lanes. With a processing rate of between 80 and 120 passengers per hour, per lane, the facility has the ability to accommodate approximately 240 to 360 peak hour passengers. The pre-board passenger screening area is currently the weakest component of the terminal with respect to peak hour processing capacity.

### **Departures Lounge**

The departure holdroom was expanded in 2008, accommodating both domestic and international operations. The lounge currently has the capacity to hold approximately 600 passengers.

### **Outbound Baggage Area**

Expansion of the outbound baggage makeup area in 2006 provided a new baggage handling system which directs bags through hold bag screening system to a common baggage make-up device. Although adequate for current conditions where there is primarily a single handler, the baggage make-up area would likely become constrained under conditions where there are multiple flights during the peak period being handled by more than one ground handler.

### **Domestic Baggage Claim**

The domestic baggage claim is approximately 476 m<sup>2</sup>. in area and is served by two flat plate claim devices with a total presentation of approximately 51m. These domestic baggage claim devices have a peak hour capacity for approximately 530 passengers.

### **International Baggage Claim**

The international bag claim area is approximately 381m<sup>2</sup>. and has a single flat plate claim device with a presentation exposure of approximately 28 lm.



## **Canada Border Services Agency**

Hamilton International is provided with full customs/immigration inspection services. In-bound international capacity is approximately 220 passengers for the international arrivals hall. Canada Border Services Agency staff are on site 24 hours per day year round, although published service hours for passenger processing are 07:00 – 23:00 daily. A cost recovery agreement is in place to provide passenger services outside of these hours. Cargo services are in place 24 hours per day.

## **Future Development Phases**

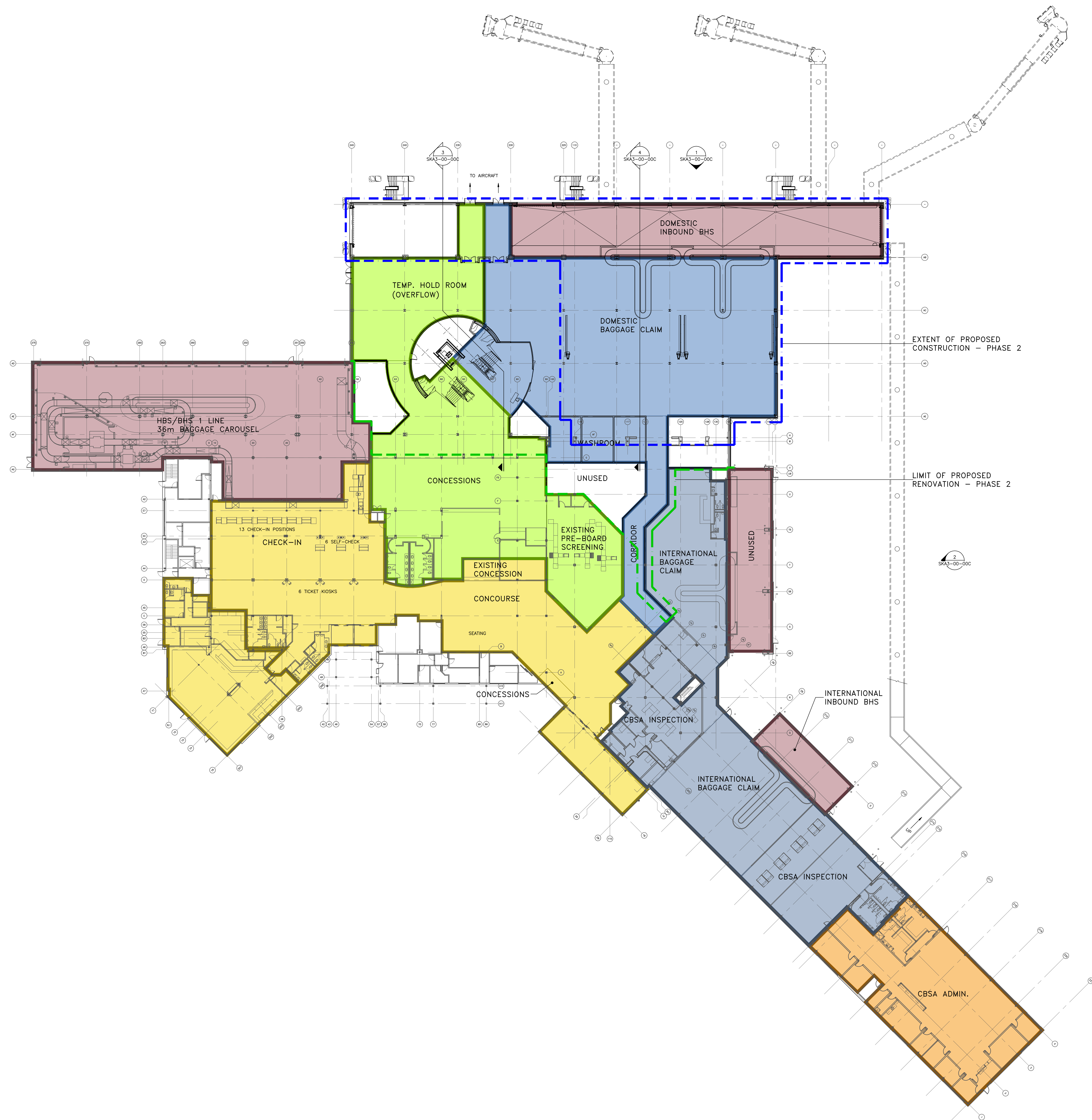
The recent expansion of the holdroom and CBSA administration areas completes Phase I of a multi-phase development program for the ATB that will accommodate foreseeable passenger demands until the year 2027, based on InterVISTAS forecast of approximately 1.5 million annual passengers and planning peak hour passenger (PPHP) demand of approximately 700 (one-way) for domestic and 730-940 (one-way) for transborder/international.

Ultimately any future development of the ATB will be predicated on actual activity demands and financial returns on investment, rather than an arbitrary time frame. With recent reductions in WestJet activity, the current terminal facility has more than adequate capacity to accommodate current and near-term foreseeable demands.

Proposed future phases of development include:

### **Phase II**

Phase II of the ATB expansion includes a two storey expansion on the north face of the building. The proposed 5,000 m<sup>2</sup> addition would relocate holdrooms to the second level and accommodate an expanded inbound baggage and domestic baggage claim in the area now used as a holdroom. The international baggage claim would also be expanded to include a second claim device. With the provision of holdrooms on a second level, passenger boarding bridges would be installed at a number of gate positions, providing a higher level of customer service. The proposed Phase II development concept is illustrated in Figures 4.3a and 4.3b.

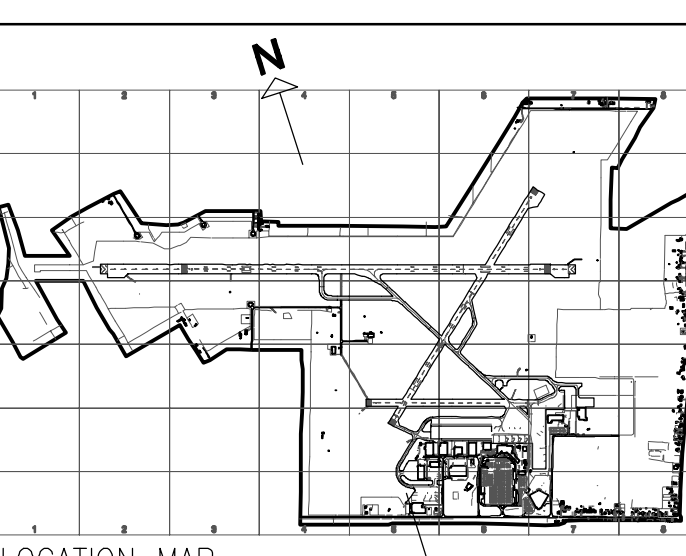
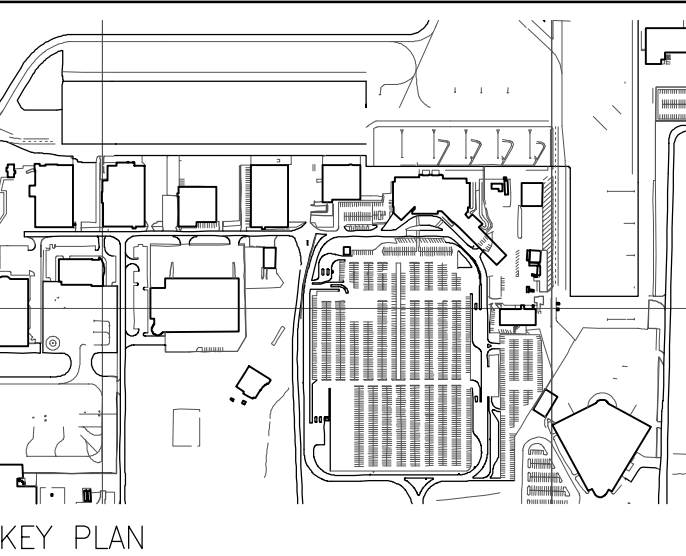


GENERAL NOTES

- PROPOSED NET FLOOR AREA:
- PUBLIC CONCOURSE**  
TOTAL FLOOR AREA APPROX. 1829 sq.m
    - CHECK-IN  
FLOOR AREA APPROX. 414 sq.m
    - CONCESSIONS  
FLOOR AREA APPROX. 444 sq.m
    - CONCOURSE  
FLOOR AREA APPROX. 751 sq.m
  - BAGGAGE HANDLING**  
TOTAL FLOOR AREA APPROX. 1975 sq.m
    - OUTBOUND  
FLOOR AREA APPROX. 1086 sq.m
    - INBOUND DOMESTIC  
FLOOR AREA APPROX. 556 sq.m
    - INBOUND INTERNATIONAL  
FLOOR AREA APPROX. 333 sq.m
  - DEPARTURES**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 1418 sq.m
    - PRE-BOARD SCREENING  
FLOOR AREA APPROX. 235 sq.m
    - CONCESSIONS  
FLOOR AREA APPROX. 474 sq.m
    - TEMP. HOLD ROOM (OVERFLOW)  
FLOOR AREA APPROX. 306 sq.m
  - DOMESTIC ARRIVALS**  
TOTAL FLOOR AREA APPROX. 1653 sq.m
    - BAGGAGE CLAIM  
FLOOR AREA APPROX. 1215 sq.m
  - INTERNATIONAL ARRIVALS**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 1405 sq.m
    - CBSA INSPECTION  
FLOOR AREA APPROX. 520 sq.m
    - BAGGAGE CLAIM  
FLOOR AREA APPROX. 723 sq.m
  - CBSA ADMIN.**  
TOTAL FLOOR AREA APPROX. 609 sq.m

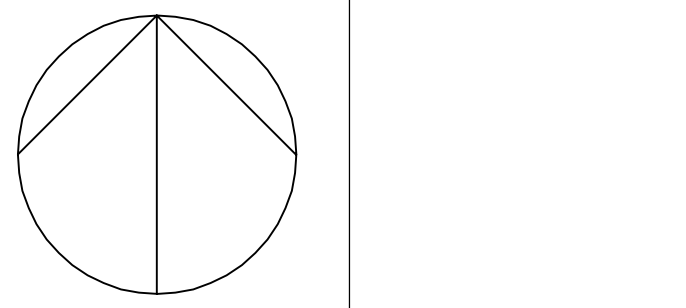


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9300 AIRPORT ROAD, SUITE 2206  
MOUNT HOPE, ON, L0R 1W0  
CANADA

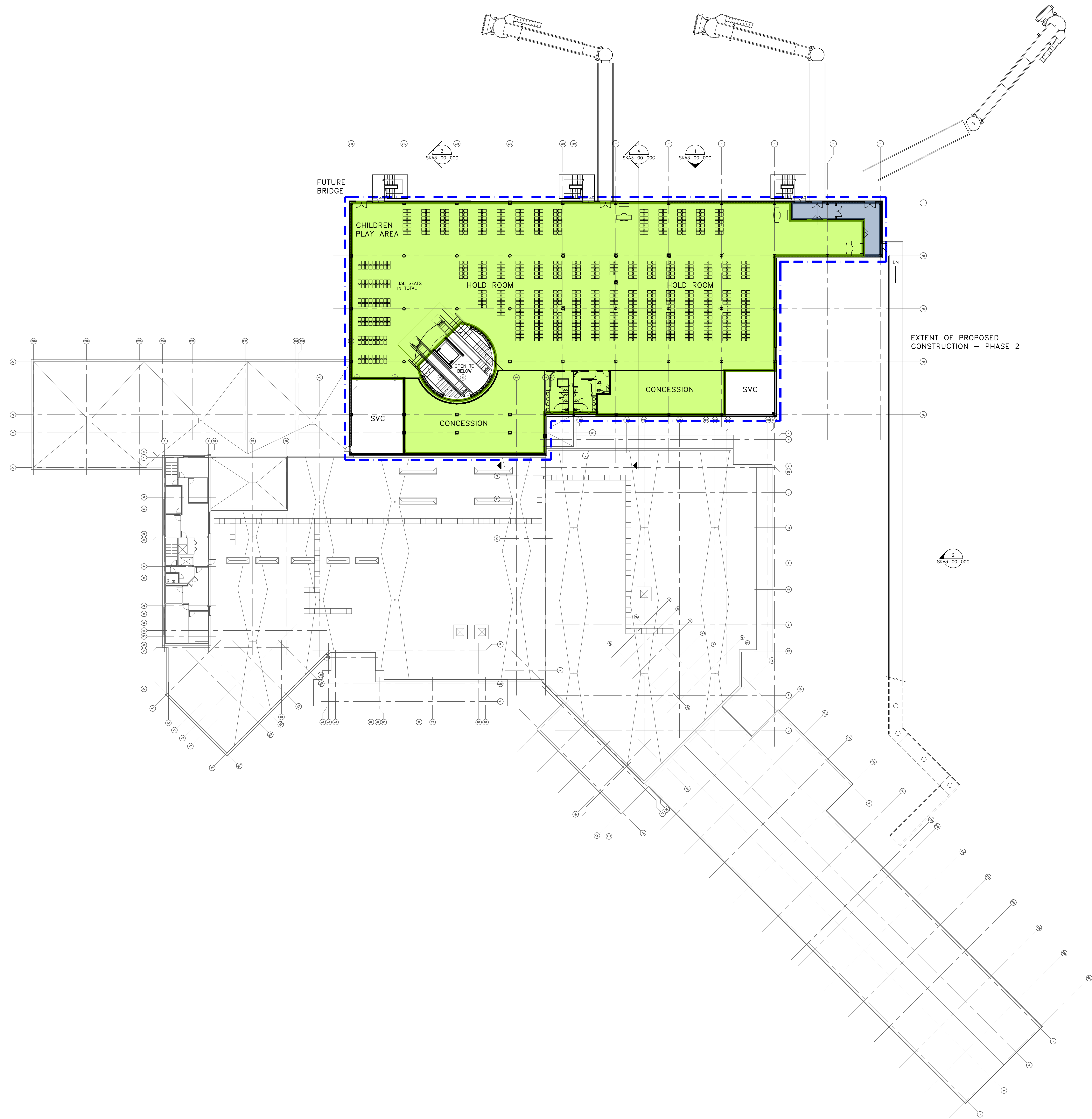


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HAMILTON INTERNATIONAL AIRPORT  
TERMINAL DEVELOPMENT PLAN  
PDR

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PROPOSED  
PHASE 2  
GROUND FLOOR PLAN OPTION 1C

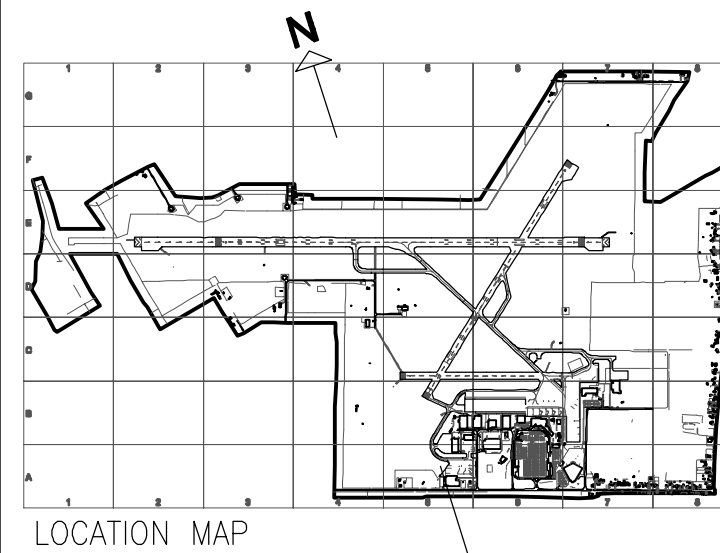
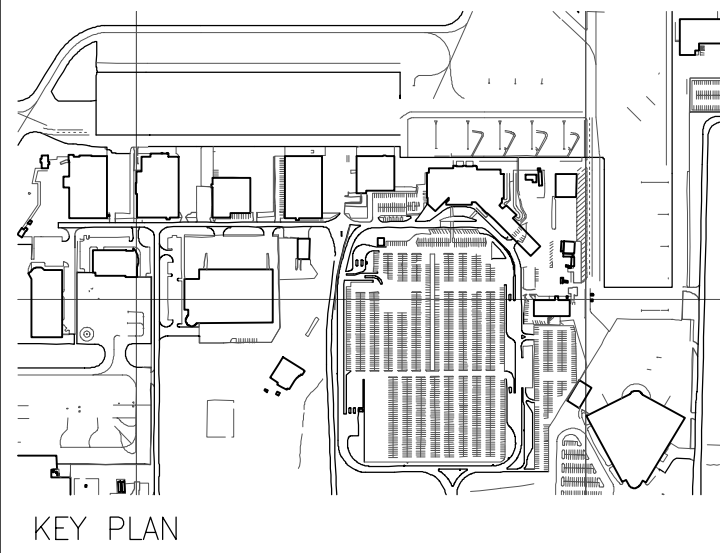
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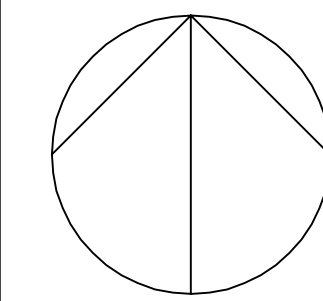
GENERAL NOTES

- PROPOSED NET FLOOR AREA:
1. DEPARTURES  
@SECOND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 2604 sq.m
    - CONCESSIONS  
FLOOR AREA APPROX. 438 sq.m
    - HOLD ROOM  
FLOOR AREA APPROX. 2045 sq.m
    - CHILDREN PLAY AREA  
FLOOR AREA APPROX. 82 sq.m
  2. INTERNATIONAL ARRIVALS  
@SECOND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 60 sq.m



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9300 AIRPORT ROAD, SUITE 2206  
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PROJECT TITLE  
HAMILTON INTERNATIONAL AIRPORT  
TERMINAL DEVELOPMENT PLAN  
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PROPOSED  
PHASE 2  
SECOND FLOOR PLAN OPTION 1C

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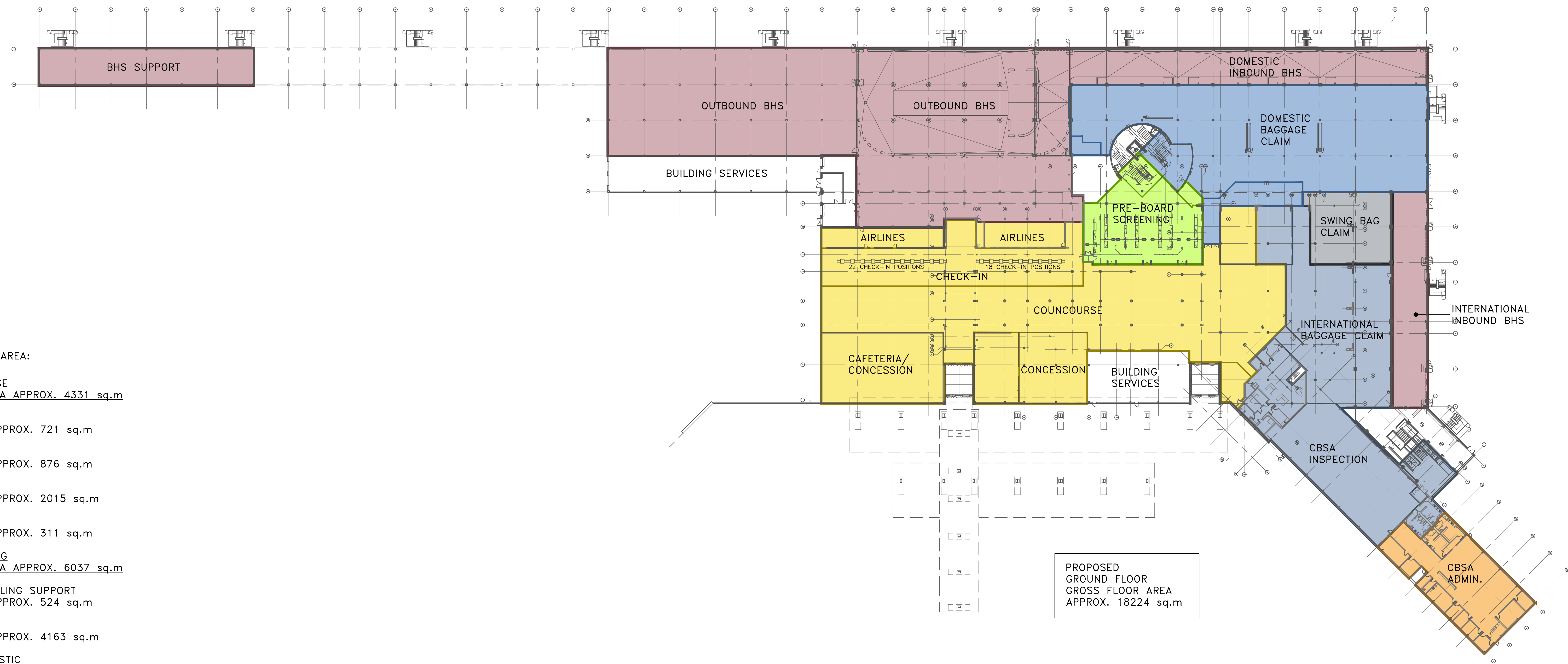
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### **Phase III**

Phase III of the ATB would include the expansion of various functional elements including check-in, pre-board screening, outbound baggage handling, and international arrivals. The proposed expansion would add an additional 17,275 m<sup>2</sup> to the terminal building. This would include a new third floor administrative area. Gate expansion could be accommodated to both the west and the south.

Depending on transborder activity, the Phase III ATB development could include a US pre-clearance facility which would include US customs and immigration plus a dedicated pre-board security screening and sterile holdroom. The proposed Phase III development concept is illustrated in Figure 4.4





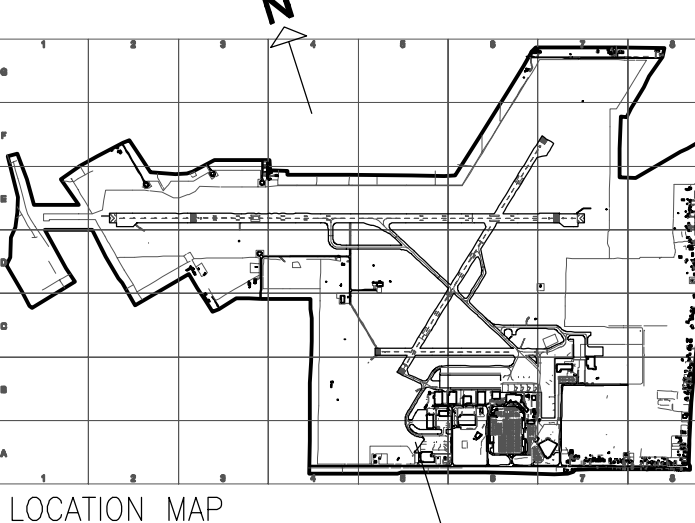
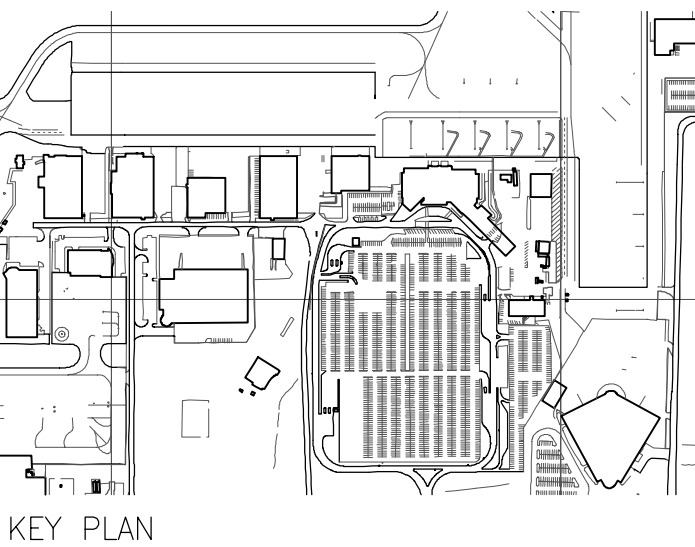
GENERAL NOTES

PROPOSED NET FLOOR AREA:

- PUBLIC CONCOURSE**  
TOTAL FLOOR AREA APPROX. 4,331 sq.m
  - CHECK-IN  
FLOOR AREA APPROX. 721 sq.m
  - CONCESSIONS  
FLOOR AREA APPROX. 876 sq.m
  - CONCOURSE  
FLOOR AREA APPROX. 2,015 sq.m
  - AIRLINES  
FLOOR AREA APPROX. 311 sq.m
- BAGGAGE HANDLING**  
TOTAL FLOOR AREA APPROX. 6,037 sq.m
  - BAGGAGE HANDLING SUPPORT  
FLOOR AREA APPROX. 524 sq.m
  - OUTBOUND  
FLOOR AREA APPROX. 4,163 sq.m
  - INBOUND DOMESTIC  
FLOOR AREA APPROX. 860 sq.m
  - INBOUND INTERNATIONAL  
FLOOR AREA APPROX. 490 sq.m
- DEPARTURES**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 639 sq.m
  - PRE-BOARD SCREENING  
FLOOR AREA APPROX. 553 sq.m
- DOMESTIC ARRIVALS**  
TOTAL FLOOR AREA APPROX. 2,301 sq.m
  - BAGGAGE CLAIM  
FLOOR AREA APPROX. 1,989 sq.m
- INTERNATIONAL ARRIVALS**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 2,249 sq.m
  - CBSA INSPECTION  
FLOOR AREA APPROX. 949 sq.m
  - BAGGAGE CLAIM  
FLOOR AREA APPROX. 985 sq.m
- SWING BAG CLAIM**  
TOTAL FLOOR AREA APPROX. 388 sq.m
- CBSA ADMIN.**  
TOTAL FLOOR AREA APPROX. 636 sq.m
- BUILDING SERVICES**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 1,016 sq.m

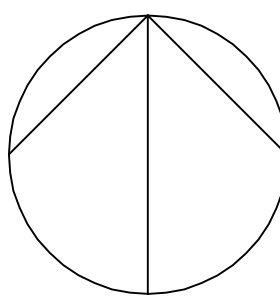


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9300 AIRPORT ROAD, SUITE 2206  
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To ensure that a future build-out of the airport terminal building can be accommodated, it is important that the area along Hangar Road be identified as a terminal reserve area within the Master Plan. The long-term future expansion of the ATB may necessitate the removal of Hangars 4 and 5 and may curtail the operation of Hangar 3. The site of the existing air terminal building is constrained by commercial development to the east (UPS) and the Canadian Warplane Heritage Museum to the South East. These constraints limit the ultimate build-out of the existing terminal in those directions.

### **4.3 AIRPORT SUPPORT FACILITIES**

Hamilton International Airport is provided with a full range of support facilities and services, which ensure the safe and efficient operation of the Airport.

#### **4.3.1 Air Traffic Control Facilities**

In 1996 all air traffic control and air navigation services and facilities in Canada were transferred from Transport Canada to Nav Canada, a not-for-profit corporation. Included in this transfer were the air traffic control facilities located at Hamilton International. Constructed in 1987, these facilities include the control tower and a support facility that accommodates administrative offices, equipment storage, workshops and staff amenity areas.

It is not anticipated that any expansion or modification of the control tower will be required within the time frame of the Airport Master Plan. To ensure that the function of the existing control tower is not compromised in the future, it is important that line-of-sight is maintained from the control tower to all primary aircraft maneuvering areas and runway approaches.

#### **4.3.2 Airside Operations Combined Services Building**

The airside operations combined services building is located west of Runway 06-24, near the control tower. The facility, constructed in 1990 as an addition to the existing fire hall, accommodates for fire and maintenance operations. It consists of three maintenance bays with a small administrative office and a parts storage area, three apparatus bays, which accommodate three crash trucks, administrative offices, and alarm room, equipment storage, and staff training and amenity areas. Although basic functional requirements have been accommodated, there are a number of deficiencies with the present building that should be addressed. These include:

- The facility is presently in need of expansion. The building cannot properly accommodate vehicle maintenance, nor can it accommodate the storage of airport maintenance vehicles and snow-removal equipment. In order to satisfy this requirement, the garage requires 4 maintenance bays plus 6-8 bays to accommodate equipment storage. Drive-through capability is required for all equipment bays.

- The present facility also does not have adequate storage for parts and equipment related to the maintenance of mobile equipment and repair of airfield items such as edge lighting fixtures, line painting supplies, etc.
- The apparatus bays are not deep enough to adequately accommodate larger crash trucks required to meet future CARs requirements.
- The present facility lacks appropriate administration and staff amenity areas. Functional areas that are currently lacking or are inadequate include: meeting room a staff lunch/lecture room; locker room/change areas, and fitness areas.
- Additional paved area outside the building is required to accommodate the maneuvering and parking of airport maintenance vehicles.
- New enclosed facilities are required for the storage of sand and anti/de-icing materials such as urea and sodium formate.
- With the purchase of new snow removal equipment, a facility that allows the equipment to be de-iced during the winter is required. At present Hangar 5 is used for this purpose. However, the hangar section is not insulated for the most part, nor designed to provide proper support for the Airport's snow removal operations.

It is recommended that the construction of an addition to the airside operations combined services building, that includes additional administration and staff amenity areas, be included as part of the short-term capital program for the Airport. The long term plan identified by the Airport is to develop a common facility for emergency response and airport maintenance that shares administrative and staff support functions.

It is also recommended that the capital program include the construction of separate shelters for the storage of sand and anti/de-icing materials.

#### **4.3.3 Aircraft Refueling Facilities**

Aircraft refueling services at Hamilton International are provided by ground servicing companies using mobile bowsters. A fuel consortium, owned by the major air carriers, operates a fuel farm on a site located off of East Cargo Road. The fuel farm has a present storage capacity 1.8 million litres of Jet A-1 fuel, and has available land on which to accommodate an additional 1.8 million litres. The fuel farm also has storage facilities for ground vehicle fuel including regular and diesel.

At present the fuel farm has no storage capacity for 100LL avgas. The purchase of avgas is available through one of the local Fixed Base Operators (FBO's). If required in the future, the fuel farm has capacity to accommodate the storage of avgas.

#### **4.3.4 Aircraft De-icing Facilities**

Aircraft deicing is undertaken by various operators using mobile de-icing units. De-icing operations take place in following designated locations:



## **Ontario Flightcraft Apron**

Aircraft de-icing is undertaken on the apron adjacent to the hangar. Glycol contaminated runoff is conveyed via storm sewer to a holding pond located west of the hangar. The holding pond includes an outlet to an adjacent creek which allows operators to manually open a valve and release the captured fluids when glycol/BOD concentrations meet appropriate levels for release to the environment as specified in the Airport Certificate of Approval. During high glycol concentrations, this pond has the capability to release to the sanitary sewer system. During de-icing operations, all releases are to the sanitary sewer.

## **Air Terminal Building (Apron 1) / South Apron (Apron III)**

Aircraft de-icing undertaken on the apron areas adjacent to the Airport Terminal Building are accommodated by a purpose built system designed to capture glycol-contaminated runoff and direct it to various outlets depending on the glycol/BOD content. All runoff directed to the holding tank during the de-icing season is discharged to sanitary. High concentrations of glycol collected from the apron surface using a vacuum sweeper is transported offsite for recycling. Outside of the de-icing season collected runoff is discharged to the storm sewer or the natural environment if effluent parameters specified in the Airport Certificate of Approval are met.

## **United Parcel Service Apron**

Aircraft de-icing undertaken on the UPS apron is directed to a storm water management pond located adjacent to Taxiway Whisky. From there, glycol contaminated runoff can be discharged to the storm sewer or the sanitary sewer depending upon the glycol/BOD concentration.

To ensure efficient deicing operations and to enhance the containment and collection of deicing fluids, a dedicated central deicing facility may be required at an alternative location. The provision of a dedicated deicing apron west of the UPS pond has in the past been considered as a potential site. If constructed, a central deicing facility should be designed to accommodate the flow-through of aircraft with 'live' engines running de-icing. This in turn would maximize the efficiency and throughput capabilities of the central facility.

In order to meet environmental regulations, procedures have been established to prevent the uncontrolled release of aircraft deicing fluids into the environment. This includes the following measures:

- Monitoring and control of surface fluid collected using catch basins installed in the deicing apron areas. Collection and separation of waste deicing fluids from deicing areas.
- Surface cleaning of the airport deicing areas.
- Monitoring of airport surface runoff to ensure compliance with environmental standards.

- Controlled storage, reclamation and disposal of used aircraft deicing fluids.

It is anticipated that the current de-icing facilities will be sufficient for existing and short term de-icing needs. The need for a centralized de-icing facility would likely be required when there is a significant increase in air carrier operations, or when on-gate de-icing is no longer practical because of operational or equipment constraints.

#### **4.3.5 Meteorological Services**

At present, a private contractor under contract to Nav Canada provides weather observation services at Hamilton International. The weather services are provided 24 hours per day seven days a week, with information being forwarded to the control tower and into Environment Canada's weather information system.

### **4.4 LANDSIDE ACCESS**

A key to the success of any airport is the ease by which the airport can be accessed and served by a regional and local road network.

#### **4.4.1 Regional Access**

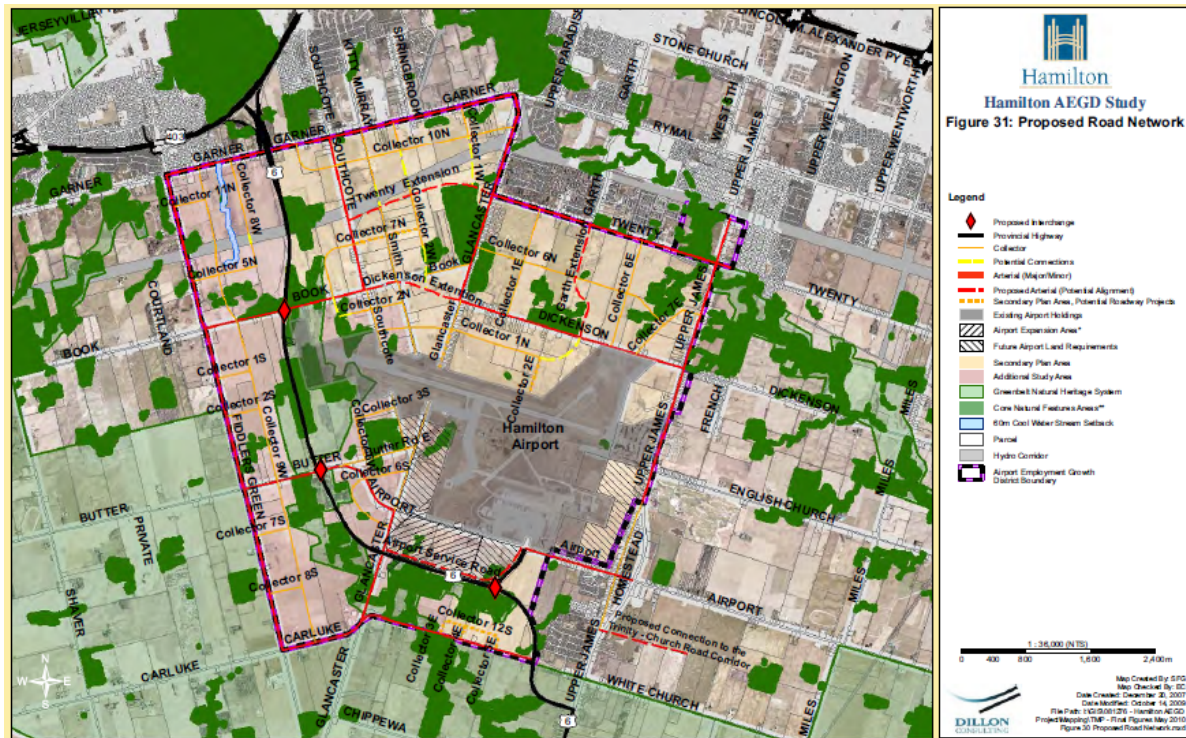
The Airport is currently served by Highway 6 which provides a direct limited access connection to Highway 403. Access to the Airport is provided at the main entrance to the terminal area. Highway 6 has sufficient capacity to meet the current needs of the Airport and can be expanded to 4 lanes in the future to meet additional traffic demands. With the expansion to 4 lanes, a new interchange is proposed for Butter Road which would serve the west and north side of the Airport and provide direct access to the areas defined by the Airport Employment Growth District.

Upper James St. (old Highway 6) connects the Airport with the Lincoln Alexander and Red Hill Valley Parkways and provides access to Hamilton's central business district. Upper James St. can become congested with traffic generated by adjacent commercial development and therefore is not the signed route to the Airport from the Parkways. In the future there may be a requirement for improved access to the Lincoln Alexander and Red Hill Valley Parkways from the east which bypasses this congestion.

Locally, the Airport is served by a number of rural two-lane roads including Airport Road, Glanaster Rd. to the west and Dickenson Rd. to the north.

With the implementation of the Airport Employment Growth District, a number of additional roads are proposed to the north and west of the Airport as required to support the development of commercial and light industrial uses slated for this area. These proposed roads are illustrated in Figure 4.5.

**Figure 4.5 Proposed AEGD Road Network**



#### 4.4.2 Airport Roadways

Four primary access roads plus an internal road serve the Airport. These roads are described below.

##### Terminal Access Road

The Terminal Access Road is a one-way, two lane road that serves the air terminal building, various parking lots and a few other facilities near the terminal building. The road is in good condition with some minor cracking near the terminal building. From a capacity standpoint, the road can adequately accommodate the levels of traffic that could be generated by existing terminal facility. The practical capacity of the Terminal Access Road is approximately 1,270 vehicles per hour. At the terminal building three lanes are provided at the departures curb, and an additional two lanes are provided as a drive-thru. Future expansions of the terminal building would include an expansion of the terminal curbs to provide additional loading zones, taxi areas, and bus/shuttle pick-up/drop-off locations.

##### West Cargo Road

The West Cargo Road is a two-lane asphalt road that provides access to the general aviation area located along the old hangar flight line. It is anticipated that this road will be decommissioned in 2011 in order to accommodate the expansion of Taxiway Delta and the Purolator apron. With the closure of the West Cargo Road, Centre Road will

become the primary access to the commercial development area located west of the terminal building.

### **Centre Road**

Centre Road is situated immediately west of the perimeter ring road that encompasses the public parking lot. The roadway is in good condition having been recently upgraded in anticipation of the closure of West Cargo Road.

### **East Cargo Road**

The East Cargo Road is located immediately east of the Canadian Warplane Heritage Museum. This road was constructed in 1997 in order to provide access to the new UPS facility. The two lane asphalt road was extended east of the UPS facility in 2001 and 2002 in order to allow development of the WestJet Hangar and Cargojet facility. Future expansion of commercial development immediately east of Apron III will require sections of this road to be relocated to the east.

### **Salem Road**

This road is located on the west side of the Airport and provides access to the airport support facilities and control tower from Glancaster Road. The road is currently in good condition.

### **Hangar Service Road**

The Hangar Service Road is located immediately south of the old hangar line and provides access to the general aviation developments located west of the terminal building. The road is in poor condition and requires complete reconstruction with proper drainage, curbs and gutters. Parking along both sides of the roadway and underground utility upgrades should also be considered.

### **Airside Roads**

At present there is only a limited network of airside roads provided on the airport property. The Airport does not have in place perimeter road system that can provide emergency response and maintenance personnel full access of the airfield. Development of a perimeter road system should be considered as part of any new airside development projects.

Airside roads, properly setback from adjacent taxiways and taxi lanes, are also required in the terminal area and commercial development/general aviation areas in order to accommodate the safe movement of airside vehicles including fuel tenders, aircraft servicing vehicles and air cargo transports.

Provision should be made to accommodate airside roads as part of new taxiway/apron development. This is especially true in locations such as Taxiway Delta where the line of sight from the control tower is obstructed.

#### **4.4.3 Parking**

In addition to the parking that is provided at individual developments, the Airport has eight principal parking facilities. Two paved lots provide public parking for the air terminal building and six other parking lots support current parking facility requirements.

The existing parking lots have the capacity to accommodate approximately 800,000 to 1,000,000 annual passengers. Further expansion of both the Economy and Premium parking lots will be required as traffic growth warrants.

##### **Economy Parking**

The Economy lot, located farthest from the ATB is designated for long-term parking. The capacity of this lot can accommodate 1475 vehicles plus 20 handicap vehicles. This parking facility (along with the Premium lot) was expanded and automated in 2002.

##### **Premium Parking**

The Premium lot is located immediately south of the ATB and accommodates 223 vehicles plus 6 handicap vehicles. A concrete sidewalk leads passengers from both public lots to the terminal building. Both lots make use of a combined automated exit at the southwest corner of the parking area.

##### **Car Rental Parking**

Two car rental parking areas exist at the Airport. The Rental Car Ready lot is located at the northwest corner of the short-term parking lot, adjacent to the diesel pump-house. This area holds 54 vehicles. The second parking area is named the Rental Car Overflow lot and is situated east of the terminal road at the north end of the employee parking lot. This lot is intended to store rental cars on a longer-term basis. This parking lot can accommodate up to 55 cars and can be expanded easily as needed.

##### **Employee Parking**

An Employee Parking lot has been created east of the perimeter ring road and accommodates 178 vehicles. Given the current level of air service, employee parking capacity is currently not a problem. With the introduction of additional air services in the future, consideration must be given to extending the existing employee parking area.

An Executive Parking lot and Loading Zone area has been created immediately west of the ATB. The Executive lot will accommodate up to 64 vehicles. The loading zone area provides a clear area for delivery trucks to unload their product. Once the ATB



construction commences this parking lot and loading zone area will be absorbed by the building expansion.

### **General Aviation Parking**

General Aviation Parking is limited to whatever space exists on the gravel shoulders on either side of Hangar Road. Some of the parking is parallel to the roadway, while some is perpendicular to the roadway. Some parking exists between the hangars within leased areas. With a proper design, an optimal parking plan could be created within the confines imposed by the existing facilities. All existing parking is leased to companies in the vicinity or rented out individually.

The Canada Customs & Revenue Agency parking lot exists at the east end of the Air Terminal Building. This lot provides a dedicated parking area for Crown vehicles used by CCRA officials. Additional queuing areas for both busses and taxicabs have also been constructed in 2002 and are located south of the Employee Parking lot.

Future parking expansion alternatives could include the development of surface parking on lands owned by Hamilton International Airport Limited south of Airport Road, and/or the construction of a parking structure on the site of the existing surface parking. Surface parking located south of Airport Road, although relatively inexpensive to construct, would likely necessitate the provision of a shuttle bus operation, which in turn would increase operating costs. Construction of a parking structure would have a much higher capital cost but would provide a higher level of customer service and would eliminate the need for a busing operation.

## **4.5 UTILITIES AND SERVICES**

### **4.5.1 Sanitary Services**

#### **Existing Municipal Sanitary Sewers**

Municipal sanitary service to the Airport is provided by the City of Hamilton through a 450 mm diameter trunk sanitary sewer located along Airport Road. This sewer flows easterly to a trunk sewer on Homestead Drive. The sewer was constructed with a slope of 0.2% has a capacity of approximately 133 l/s. The sewer then flows northerly on Homestead to a sanitary pumping station located approximately 1,200 meters north of Airport Road. Due to the capacity of this pumping station, the City of Hamilton has placed a restriction of 53 liters/second for peak discharge from the Airport.

Given the potential for future commercial expansion on Airport property, existing and future sanitary sewage demands and allocations should be reviewed. The City of Hamilton, as part of the AEGD planning process has identified a potential demand of approximately 2.4 - 2.6 ML/d.



The Airport is drained by four separate systems which are all connected into the existing 450 mm diameter sewer line on Airport Road.

#### **Sanitary System No.1 East Cargo Road Commercial Property**

Sanitary System No.1 consists of a 300mm diameter sewer line on East Cargo Road, which drains the WestJet Hangar, the UPS building and effluent from the UPS glycol / stormwater management facility, Cargojet Hangar, fuel farms as well as provisions for future development of Airport lands east of the Cargojet hangar.

#### **Sanitary System No.2 Canadian Warplane Heritage Museum**

Sanitary system No.2 consists of a 150mm diameter sewer line, which drains the Canadian Warplane Heritage Museum.

#### **Sanitary System No.3 Airport Terminal Building**

Sanitary System No.3 consists of a 250mm diameter sanitary sewer line, which drains the existing ATB and the stormwater / Glycol Management Facility. Future expansion phases of the terminal building will likely require upgrades to the sanitary system.

#### **Sanitary System No.4 Commercial Property West of Terminal Building**

Sanitary System No.4 drains all groundside buildings located west of the existing ATB by means of a 300mm diameter sanitary sewer line.

At present, there are no municipal sanitary services provided to the fire hall, maintenance garage or control tower. Consideration should be given in the future to the provision of sanitary services to these facilities.

It is anticipated that the existing sanitary sewer lines are adequate to handle short term expansion within the Airport's boundaries but provisions for upgrades should be considered for short to long term development of outlying lands as proposed within this Master Plan.

To accommodate future demands, a Water and Wastewater Management Plan has been prepared as part of the AEGD planning process. This Plan recommends a phased implementation strategy that would construct a new network of sewers to the north of the Airport and a new forcemain trunk sewer along Upper James Street to Dickenson Rd.

### **4.5.2 Municipal Water Supply**

#### **Existing Municipal Supply**

Municipal water servicing is provided for the Airport by the City of Hamilton through a 300mm diameter water main connected to a 400 mm diameter water main located on Airport Road. The 400mm diameter water main is fed from a water main located to the east on Homestead Drive.

The 300mm diameter water main on airport property in turn supplies the ATB fire protection distribution system through an electric pump with a diesel backup and also supplies the domestic water services to the terminal building, hangars and other buildings.

Three existing water services feed the Airport and provide services for:

- East Cargo Road Commercial Property
- Canadian Warplane Heritage Museum
- Airport Terminal Building and Commercial Property East of Terminal Building

The existing water supply from the City does not provide adequate flow or pressure to the land development along East Cargo Road. This waterline supplying the developable lands to the east of UPS/ WestJet is fed by a dead-end run. To ensure that constant flow and pressure are available at this end of the Airport, the East Cargo Road waterline should be tied into the Homestead water main so as to create a closed loop. This can only be done once the Airport secures the lands to the east of the Airport so that a utility easement can be created.

### Proposed Municipal Supply

In order to provide additional water supply to the Airport and surrounding area, the City of Hamilton constructed a new 600mm water main routed south on Glancaster Road, passing under Runway 12-30 and then east on Airport Road to connect to the existing 400 mm diameter water main, which feeds the Airport.

All future municipal water supply and conveyance of sewage from the Airport should be addressed by the City of Hamilton as part of the Airport Employment Growth District. The following table proposes future water requirements:

<b>Table 4.9 Future Airport Water Requirements</b>						
	<b>Total area (Ha)</b>	<b>% land at medium useage</b>	<b>Med. Use Volume</b>	<b>% land at high useage</b>	<b>High Use Volume</b>	<b>Total water volume / Phase</b>
<b>Short term</b>	197	50%	3,900,600	50%	8,865,000	<b>12,765,600</b>
<b>Medium term</b>	269	50%	5,326,200	50%	12,105,000	<b>17,431,200</b>
<b>Long term</b>	171	50%	3,385,800	50%	7,695,000	<b>11,080,800</b>
<b>Very long term</b>	319	50%	6,316,200	50%	14,355,000	<b>20,671,200</b>
<b>Total</b>	<b>956</b>		<b>18,928,800</b>		<b>43,020,000</b>	<b>61,948,800</b>

### 4.5.3 Fire Protection System

#### Existing Fire Protection System

The existing fire protection distribution system for the terminal building and hangar area is provided by a 300mm diameter fire main fed through an electric pump with a diesel pump backup located in the fire pump house. Fire protection service for the existing ATB is

provided by means of a 200mm diameter fire service fed from the 300mm diameter fire main.

The WestJet facility along East Cargo Road is protected by a new 600,000 USG water reservoir tank and pump house system capable of 10,000 US gallon/minute output, utilizing 4 diesel pumps.

Based on calculations previously carried out by NORR Limited, no upgrading of the existing pump house or service was deemed necessary for the short term ATB Phase I expansion.

#### **4.5.4 Natural Gas**

##### **Existing Natural Gas Service**

An existing high-pressure natural gas main is located on Airport Road, with branch lines providing services for:

- East Cargo Road Commercial Property
- Canadian Warplane Heritage Museum
- Airport Terminal Building and Commercial Property East of Terminal Building

A 75 mm gas line feeds into the Airport from Airport Road, north along Center Road to the intersection of Hangar Road. From this point a 25mm diameter gas line provides service to the south side of the ATB. A 50 mm gas line services commercial property east of the terminal building. A 50 mm line also services the commercial properties located along East Cargo Road.

##### **Proposed Natural Gas Service**

It has been estimated that the total connected load of all existing and new equipment in the expanded ATB (Phase 1 & 2) would be 22,344 cubic feet per hour. In order to provide adequate service for the expanded ATB, Union Gas is proposing to carry out several reinforcement upgrades off site as well as construction of a new high-pressure 100mm service to the terminal from the 75 mm diameter gas main at Center Road. It is proposed that the new service, meter and PRV will be located on the west side of the expanded ATB.

It is also recommended that the gas line along Center Road just south of the intersection of Hangar Road be lowered and / or relocated as it conflicts with the drainage and pavement structure improvements contemplated for this area.

#### 4.5.5 Stormwater Servicing

##### Existing Stormwater Servicing

A Stormwater Management Study prepared in 2009<sup>11</sup> identified a total of 32 drainage areas and outlets associated with the Airport lands. The largest of these areas is approximately 142.5 ha in size, with the average area being approximately 15 ha in area. The majority of storm water runs directly off the Airport lands by means of open ditches. In areas of existing development there are a number of storm water management ponds designed to control the quantity and quality of runoff. These ponds include:

**Pond 1** – Located in proximity to the Ontario Flightcraft hangar, Pond 1 has two separate facilities, one of which has been specifically designed to contain and treat glycol contaminated runoff from the Ontario Flightcraft apron.

**Pond 2** – Pond 2 is located northwest of the UPS site adjacent to Taxiway Whisky. The pond is used for both stormwater retention and for the collection of glycol contaminated runoff from de-icing operations. Discharge from the pond can be directed to storm water or to sanitary, depending on the concentration of glycol and other effluent parameters specified by the Ministry of Environment.

**Pond 3** – Pond 3 is located adjacent to the Canadian Warplane Heritage Museum and has been designed to control storm water coming from the parking lot to pre-development levels.

**Ponds 4 and 5** – Ponds 4 and 5 are located east of the East Cargo development area and have been designed to control post-development runoff to pre-development levels.

The 2009 stormwater study did not identify any significant concerns with the existing storm water drainage system. However, it did recommend that ongoing maintenance and inspection activities be carried out to ensure that proper flows at culverts and outlets are maintained.

##### Proposed Stormwater Servicing

The 2009 Stormwater Management Study identified a series of storm water management ponds which would be located around the periphery of the Airport lands to provide quantity and quality controls associated with the future expansion of airport infrastructure. In addition, the study recommended that future development utilize rooftop and parking lot storage along with infiltration ditches in order to maintain groundwater recharge and reduce the size and number of storm water management facilities.

With the proposed development of surrounding lands as part of the AEGD, it is important that the implementation of storm water management practices on the Airport be

<sup>11</sup> Stormwater Management Systems Review, Hamilton International Airport, Weslake, July, 2009

coordinated with those of the City of Hamilton. This could ultimately result in a reduction in the number and size of storm water ponds located on Airport property.

#### **4.5.6 Electrical Service**

##### **Normal Power**

Up until 2007, Hamilton international Airport had a single 27.6 kV Hydro One supply to the Field Electrical Centre (FEC) located near the Maintenance Garage. This had the capacity of providing up to 1500 kVA to all of the buildings on the Airport.

In 2007, a project was undertaken to upgrade the Terminal Building power supply. A new 27.6 kV underground supply capable of providing up to 5 MVA of power was derived from the overhead line on Centre Road to a new 1500 kVA transformer to the front of the Terminal Building. From there, 600 V secondary underground cables supply a 1600 A, 3 phase – 4 wire main switchboard in the main electrical room of the terminal. This power supply is sufficient to service the short to medium term development requirements of the Terminal Building.

The existing Pump House is fed from a 200A, 600V, 3-phase, separately metered utility service from a 27.6kV utility pole located west of the pump house.

##### **Emergency Power**

As part of the 2007 power upgrade project, a 160kW standby diesel generator was provided to replace a 60kW supply derived from the generator at the FEC. The generator was sized to cover the existing life safety and essential loads, while affording additional capability for short-medium term developments. Presently, there is approximately 100kw capacity available on this generator.

The pump house is fed by a 70A, 600V, 3-phase, emergency service from the terminal's emergency splitter but this service does not serve the 60 HP electric fire pump which currently has no emergency service. There is however a diesel driven fire pump that provides backup fire protection. This diesel pump was replaced in 2004.

#### **4.5.7 Communication Services**

The Airport is currently served by adequate telephone and communication services. This service will suffice in accommodating the Airport's needs in the short term, although some expansion of service may be required in the medium to long term; in particular, the expansion of fibre-optic cables.

With the recent installation of a new cell tower located south of Airport Road, the Airport is generally well served by cellular phone service.



## **4.6 COMMERCIAL DEVELOPMENT**

There are a number of commercial and general aviation operators and businesses presently located at the Airport that provide a wide spectrum of services.

### **4.6.1 Air Cargo/ Courier**

The most significant activities are the air cargo/courier operators. At present, there are a number of air cargo/courier operators located at the Airport. The largest of these operators include UPS, Purolator, DHL and Cargojet.

Currently air cargo/courier activities are accommodated in approximately 18,000 m<sup>2</sup> of building space. This includes the new UPS facility as well as Glanford Aviation and Ontario Flightcraft facilities. UPS and Purolator both have dedicated cross-dock facilities. DHL has leased the WestJet hangar on an interim basis as a sort facility and a long term solution will be required. The majority of Cargojet's operation is direct truck to aircraft. Some limited sortation takes place in Hangar 4. In the longer term a more appropriate facility will be required.

A problem with the current facilities is that, with the exception of the new UPS and Purolator facilities, much of the air cargo/courier activity is being accommodated in hangar facilities that are less than adequate. To help alleviate this constraint, the Airport is proposing the construction of a multi-tenant cross-dock facility on a site located immediately east of the East Cargo Road. As proposed, this development would include a 7,800 m<sup>2</sup> cargo facility, truck maneuvering areas and an airside apron capable of accommodating a number of Code D aircraft.

If Hamilton International meets the growth in air cargo/courier activity anticipated in the Hamilton Airport Strategic Study, there could be a demand for approximately 90,000 m<sup>2</sup> to 125,000 m<sup>2</sup> of air cargo facility space by the year 2020. This translates into a land requirement of approximately 26 to 36 hectares.

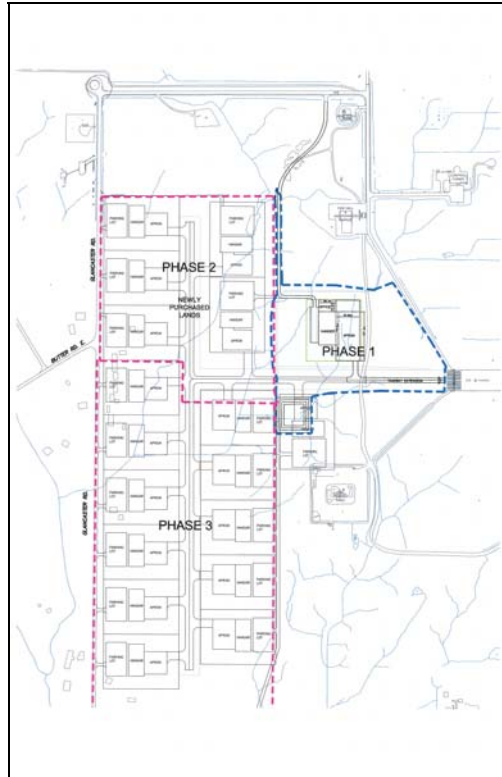
### **4.6.2 General / Commercial Aviation**

Presently, there are a number of general aviation / commercial operations located at the Airport. All of these activities are located west of the Air Terminal Building and north of Airport Road. The early 1990's saw the development of a number of new facilities including the Transport Canada Services hangar, Ontario Flightcraft hangar, Canadian Warplane Heritage Museum, the Jetport hangar and most recently the AIC hangar. To accommodate the expansion of general aviation activities, Taxiway Delta was constructed in 1994 and Taxiway Whiskey was constructed in 2002. Taxiway Delta provides access to lands located between Airport Rd. and the old hangar line, while Taxiway Whiskey provides access to lands located east of UPS. An additional 7.2 ha of developable land will be made available when West Cargo Road is closed in favor of extending Taxiway Delta. This is scheduled to occur in 2011.

It is anticipated that expansion of general aviation will focus on activities related to the support of air cargo/courier activities and business/corporate aviation. These include aircraft servicing, maintenance and storage. In the near future it is also anticipated that a local college will begin a flight training program at the Airport.

A preliminary development concept has been prepared for a proposed general aviation commercial area located west of Runway 06-24 and east of Glancaster Rd. Illustrated in Figure 4.6, the concept provides for approximately 18 commercial lots.

**Figure 4.6 Preliminary Development Concept**



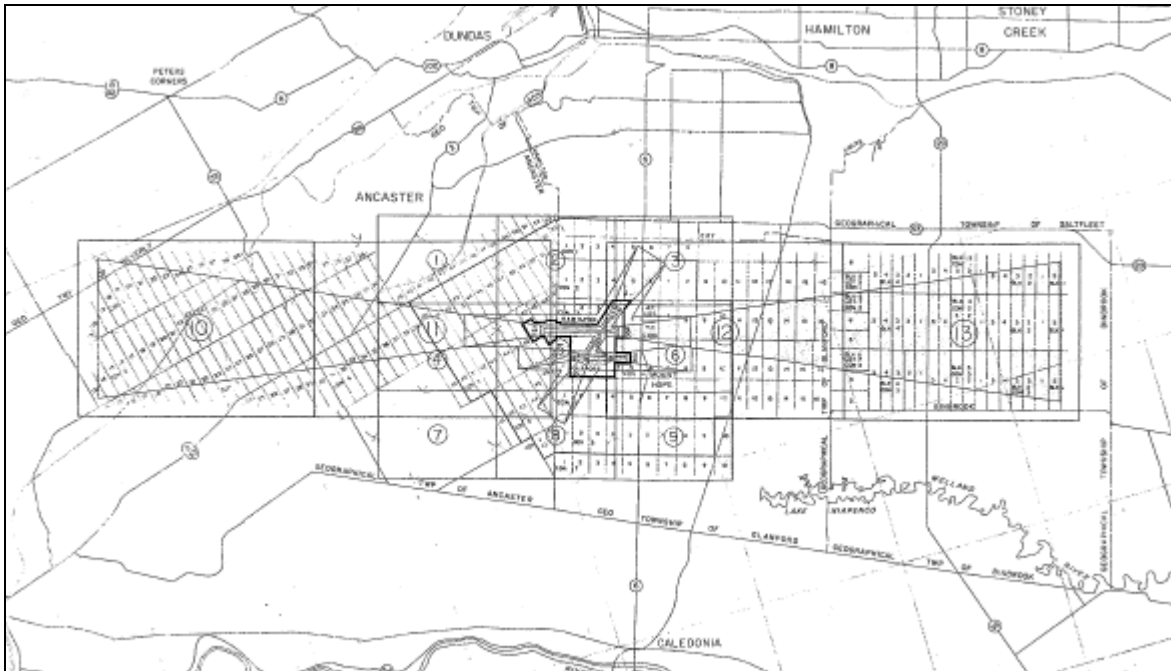
#### **4.7 AIRPORT REGISTERED ZONING**

The Hamilton Airport Zoning Regulations is a federally legislated document designed to protect the existing and future approach and departure flight paths from both natural and man-made obstructions. All owners of land parcels described within the Airport Registered Zoning Regulations must abide by the restrictions and covenants as written in the regulations. The Hamilton Airport Zoning Regulations can be found at the Land Registry Office in Hamilton.

This document, which provides a fundamental degree of safety for all existing and future aircraft operations, must be revised to allow for the expansion of Runway 06-24 in the future. A process to amend the Airport Registered Zoning has been initiated by HIAL and is currently being undertaken by Public Works and Government Services Canada. The amended zoning will take into consideration potential extensions to both Runway 12-30, and Runway 06-24.

The existing Registered Zoning for the Airport is provided in Figure 4.7.

**Figure 4.7 Existing Airport Registered Zoning**



Source: Airport Zoning Regulations 1983, Transport Canada

## 5.0 Strategic Plan

### 5.1 MISSION STATEMENT

Hamilton International Airport Limited's vision for Hamilton International Airport is predicated on the following mission statement identified in the *Strategic Plan 2020*<sup>12</sup> prepared in October 2007.

*Hamilton International Airport provides customers and community with a convenient, hassle free high value airport experience which maximizes stakeholder value.*

The mission statement recognizes the leadership role which Hamilton International Airport Limited must play in the Airport and broader communities, and the customer service focus required for success.

### 5.2 STRATEGIC VISION

The strategic vision for Hamilton International can be summarized as follows:

*To achieve hi's full potential by becoming*

- *The low cost, friendly gateway to the Southern Ontario region, and*
- *#1 inter-modal air freighter gateway in Canada.*

### 5.3 AIRPORT ROLE

Hamilton International is somewhat unique in Canada because of the diversity of activities it supports. The Airport's current activities range from recreational activities using small light aircraft, to scheduled air carrier and air courier/cargo activities which utilize large jet aircraft such as the B727, B737, B757, B767 and DC-10 aircraft.

The Airport's primary role is to serve as a regional commercial and general aviation airport capable of providing scheduled air services, charters, air cargo/courier activities and flight training services.

### 5.4 STRATEGIC OBJECTIVES AND INITIATIVES

Realizing the strategic vision for the Airport will require the well planned execution of a series of strategic objectives and initiatives in three areas of focus: facilities, airline and cargo partners, and the airport community. The Strategic Plan 2020 identifies eight objectives which respond to the following challenges:

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<sup>12</sup> Strategic Plan 2020 for Hamilton International Airport Limited, InterVISTAS Consulting Inc. 2007



- Achieve more aggressive and sustained traffic growth and market penetration.
- Plan, develop and operate expanded facilities to support the new market targets.
- Diversify revenue sources to allow the Airport to maintain its low cost mission.
- Continue to improve ground access to the broad catchment area.
- Develop a more focused and systematic approach to customer service.
- Maintain and enhance a focused and systematic approach to airport operations and efficiency.
- Foster environmentally sound airport operations.

#### 5.4.1 Objective #1

##### **Invest in Customer-Focused Infrastructure and Facilities Which Produce a Return**

Airport facilities and infrastructure are the underpinnings of hi's ability to achieve the vision for Hamilton international Airport. The challenge is to undertake these investments without undermining the low cost nature of the hi market and its air carriers. This will require that capital investments be undertaken in time to support new passenger and cargo services and not impede growth, and at the same time be economically viable.

Key to this is the preparation of annual capital plans based on 5-year outlooks which tie together the resources and financing required to deliver the required infrastructure.

Specific strategies and initiatives include:

- Deliver passenger facilities to support market growth.
  - Invest in Terminal Expansion plan in order to accommodate the current peak period volumes.
  - Identify trigger points for future development.
  - Identify long term airport-wide capital requirements and their timing.
  - Seek smallest economic scale of expansion to add flexibility.
  - Maintain an up to date Master plan for the Airport
  - Plan capital requirements on an annual basis
- Deliver cargo facilities to support market growth
  - Develop a multi-tenant special services intermodal cargo facility
  - Increase the amount of ramp space to support cargo operations

- Identify trigger points for future development phases
- Identify long term airport-wide capital requirements and timing
- Seek smallest economic scale of expansion to add flexibility
- Maintain an up to date airport master plan
- Plan capital requirements on an annual basis
- Attract a developer/partner
- Maintain low-cost structure
  - Monitor logistics costs for cargo activity
  - Establish incentives to attract new carriers or expanded service
- Seek partnership investments
  - Seek opportunities for government and stakeholder investments in facilities
  - Develop business cases for potential investment opportunities
  - Maintain strong community relationships
- Maintain Common use principles
  - Adopt a 'smart airport' orientation
  - Invest in smart terminals systems where cost effective
  - Apply common use principles to both cargo and passenger facilities as appropriate

#### **5.4.2 Objective #2**

##### **Enhance Revenue Opportunities**

A key strategy is to maintain hi as a specialist airport serving low cost carriers. One means of maintaining competitive rates and charges is to develop alternative sources of revenues.

Specific strategies and initiatives include:

- Maximize parking revenues.
- Expand ground transportation revenues.

- Develop new concession opportunities.
- Increase advertising revenues.
- Develop airport lands to highest possible commercial revenue generation.
- Long term development of revenues from airport services.

### **5.4.3 Objective #3**

#### **Expand Passenger Air services**

In the past Hamilton International Airport has enjoyed phenomenal passenger growth. In 2002 the Airport was the 3<sup>rd</sup> busiest in Ontario and the 11<sup>th</sup> busiest in Canada. With the relocation of Westjet's operation to Toronto in 2004, passenger traffic has subsequently fallen off.

In order to restore and expand passenger activity at hi, specific strategies and initiatives include:

- Solidify hi's role as Southern Ontario's low-cost domestic passenger gateway.
- Expand ground transportation links to Toronto and other regional centres.
- Restore transborder air services.
- Increase scope of low cost international services.
- Support existing and new services to maintain and enhance their viability.

### **5.4.4 Objective #4**

#### **Increase Air Cargo Traffic**

Based upon its geographic position within Southern Ontario and proximity to US markets, hi has the potential to solidify its role as Canada's primary gateway for air cargo traffic. The Airport has achieved a role as a major domestic overnight courier hub. The challenge is to grow beyond this by attracting transborder and international activity.

Specific strategies and initiatives include:

- Advocate liberalization of international air cargo bilateral agreements.
- Aggressively market cargo operators.
- Develop a multi-tenant cargo facility.

- Attract distribution and freight forwarded businesses.
- Support improved ground transportation access to the Airport.

#### **5.4.5 Objective #5**

##### **Promote Regional Tourism**

Southern Ontario and the Niagara Peninsula possess a number of world class tourist attractions, festivals and events which draw tourists from all parts of North America and the world. In 2015 Toronto, Hamilton and other cities in Southern Ontario will play host to the Pan American Games. While Toronto-Pearson traditionally has accommodated tourism activity, hi is well positioned in terms of geography and affordability to capture and expand the tourism market. hi must therefore set as an objective the promotion of the Airport as a tourism gateway.

Specific strategies and initiatives include:

- Promote of hi as a gateway to the Greater Toronto Area (GTA) and the Niagara Region through increased market awareness initiatives with the tourism and travel industries.
- Promote of Hamilton and the GTA/Niagara region as a tourism destination.
- Develop tourism products which integrate hi air services with the tourism and hospitality industries
- Use the terminal building to promote a sense of place and regional attractions.

#### **5.4.6 Objective #6**

##### **Maintain High Customer Satisfaction**

hi has established a reputation for high customer satisfaction. Given that this high level of customer satisfaction is a key strength of hi, it is critical that it be maintained and even improved upon. It is important that hi formalize its approach to customer service.

Specific strategies and initiatives include:

- Continually track and respond to customer satisfaction.
- Develop a customer service strategy and implement a customer service program.
- Extend customer service focus to all airport stakeholders.

#### **5.4.7 Objective #7**

##### **Maintain a High Standard of Airport Operations and Efficiency**

Safe and efficient airport operations, have been key components to hi's success to date, and are key to the Airport sustaining its position as a low cost gateway. As activities at the Airport increase and technologies become more complex it will be necessary for hi to adopt a more structured approach to maintaining standards and procedures.

Specific strategies and initiatives include:

- Develop operational procedures and protocols which are documented and regularly updated.
- Provide reliable information services and technologies to support Airport's strategic and operational plans.
- Achieve high productivity to support the low cost mandate.
- Develop a safety focused culture

#### **5.4.8 Objective #8**

##### **Foster Environmentally Sound Airport Operations**

Proper environmental stewardship is becoming increasingly important to the community, the aviation industry and the traveling public. It is important for hi to be environmentally responsible with respect to operations and development.

Specific strategies and initiatives include:

- Update and implement the Airport's noise and environmental plans.
- Develop facilities which minimize environmental impacts including energy use and mitigation of emissions and discharges
- Develop strategies to support carriers regarding greenhouse gas reduction targets and/or offsets.



## 6.0 Land Use Plan

### 6.1 GENERAL AIRPORT DEVELOPMENT CONCEPT

The basis for planning a functional airport begins with a general airport land use development concept. The primary goal of an updated Land Use Plan for Hamilton International Airport is to guide future development in an efficient and cost effective manner, while recognizing the Airport's strategic operational and business objectives. The updated Future Airport Development Plan is presented in Figure 6.1.

#### 6.1.1 Airport Planning Considerations

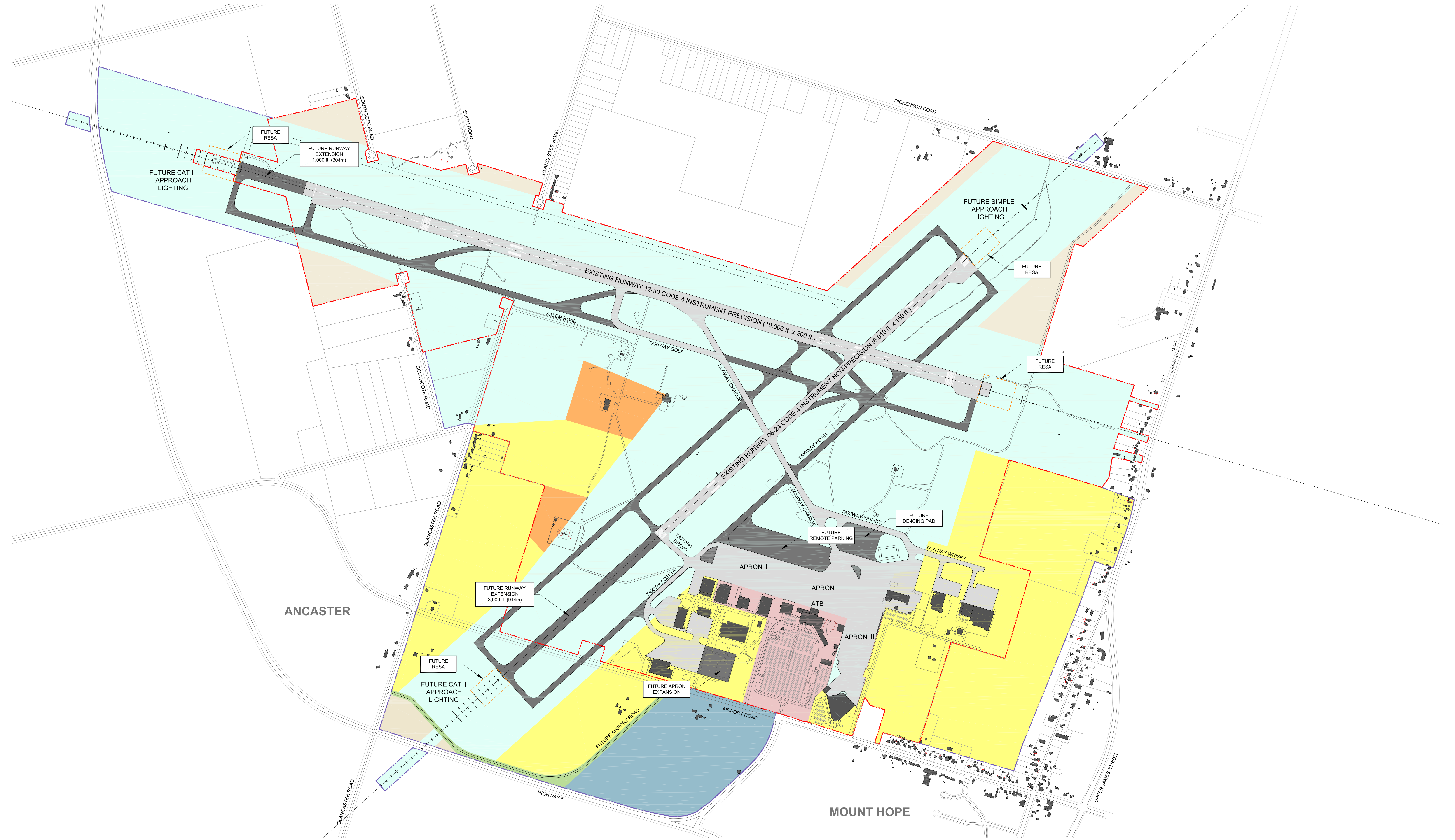
In the preparation of a preferred development concept for the Airport, there are a number of planning considerations that shaped the overall direction and scope of the Airport Master Plan and the Airport Master Plan Update.

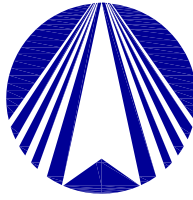
These planning considerations included the following:

1. Under the terms of the Agreement between the City of Hamilton and HIAL, the geographical scope of the Airport Master Plan was defined by specific limits. These limits were: "Dickenson/Book Roads to the north, the Highway 6 Airport Expressway to the south and west, the existing Highway 6 and Village of Mount Hope to the east and the Aeropark Lands".
2. Beyond the described limits, the Agreement further states that the Airport Master Plan should designate preferred non-conflicting land uses (as it relates to noise and wildlife control) for lands surrounding the Airport and contained within the Airport's noise exposure forecasts.
3. The Airport Master Plan takes into consideration and has due regard for the City of Hamilton's Official Plans, including recent amendments to amend the urban boundary and lands identified under the Airport Employment Growth District (AEGD). The Airport Master Plan closely interfaces the Airport's Land Use Plan with those of the adjacent communities in a manner that would both optimize development opportunities for the Airport and at the same time reinforce the planning objectives of the respective municipalities.
4. The Airport is constrained by the limited area within the existing property limits that is available for development. The Airport Master Plan focuses on the optimum utilization of these lands for short term development while retaining flexibility for additional land acquisition to accommodate longer term development initiatives.



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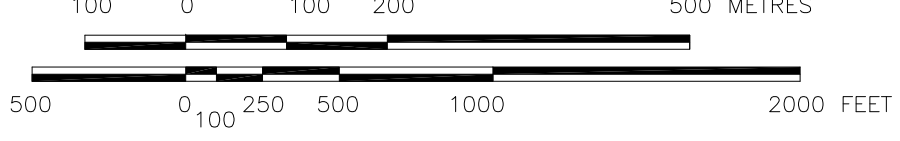
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Revisions				
No.	Description	By	App'd.	Date
0	FIRST DRAFT	JJH	GB	DEC-2010
1	FINAL REPORT	JJH	GB	APR-2011

Notes

1. FOR PLANNING PURPOSES ONLY.
2. EXISTING AIRPORT PAVEMENTS BASED ON THIRD PARTY DATA.
3. DRAWING SHOWN IN UTM PROJECTION NAD27 ZONE 17.
4. RUNWAY STRIP AND APPROACH SURFACES BASED ON TP312 4TH EDITION.
5. BUILDINGS, ROADS AND TOPOGRAPHICAL FEATURE LOCATIONS ARE APPROXIMATE ONLY - BASED ON THIRD PARTY INFORMATION.

**SCALE 1:7500**  
ON 24"x36" (ARCH D)



**GENERAL LEGEND**

--- EXISTING AIRPORT BOUNDARY	--- FUTURE AIRPORT BOUNDARY
--- EXTENDED RUNWAY CENTRELINE	--- EXISTING LEGAL BOUNDARY
--- EXISTING ROAD	--- FUTURE ROAD
--- FUTURE RUNWAY END SAFETY AREA	--- FUTURE AIRSIDE PAVEMENTS
■ EXISTING STRUCTURE / BUILDING	■ AIRSIDE COMMERCIAL
■ EXISTING AIRSIDE PAVEMENT	■ LANDSIDE COMMERCIAL
■ FUTURE AIRSIDE PAVEMENTS	■ AIRPORT SUPPORT
■ FUTURE STRUCTURE / BUILDING	■ TRANSPORTATION RESERVE
■ AIRPORT RESERVE	■ TERMINAL RESERVE
■ AIRSIDE RESERVE	

Client/Project  
**HAMILTON INTERNATIONAL AIRPORT  
20 YEAR MASTER PLAN UPDATE**

Hamilton, ON

Title  
**FIGURE 6.1  
HAMILTON INTERNATIONAL AIRPORT  
FUTURE DEVELOPMENT PLAN**

Designed by: JJH	Scale: 1:7500 (24X36 SHEET)	
Own by: JJH	Reviewed by: GB	Project No.
Revision: 1	Drawing No. FIG 6.1	06349



### 6.1.2 Opportunities and Constraints

There are a number of opportunities and constraints associated with the development of the Airport. These are listed in the following paragraphs:

#### **Opportunities for development include:**

1. The City of Hamilton's 'Airport Employment Grow District' recognizes the important economic impact which the Airport brings to the community and identifies lands surrounding the Airport for employment growth which is compatible with the long term development of the Airport
2. The Airport is located away from environmentally sensitive areas. However, the development must follow sustainable guidelines and consideration must be given to the fact that the Airport is located at the headwaters of two watersheds.
3. Completion of the Highway 6 link to Highway 403, and the Red Hill Valley and Lincoln Alexander Parkways has improved ground access to the Airport and reduced travel times to major markets.

#### **Constraints to development include:**

1. At present there is limited suitable land available within the existing airport boundaries to accommodate the expansion of Runway 06-24 and future commercial development. It is critical that additional lands be acquired adjacent to the Airport to allow for future expansion of airside and non-airside commercial development.
2. A large tract of the Airport's prime developable land is sterilized because of electronic zoning requirements imposed by the RAMP radar facility. Transport Canada's Electronic Restricted Zones Planning Guide states that within 300 m of the radar site, no building or other structure should be allowed to exceed a height of 5 m below the geodetic height of the antenna platform. The preference is to have no structure at all. Restrictions are also imposed on building heights and construction materials for development within a 1000 m radius (and beyond) of the radar site. This requires that future terminal building expansion plans consider these limitations imposed by this facility.
3. The area presently serviced by municipal services is limited to sites adjacent to Airport Road, which is presently developed, and to lands adjacent to the Cargojet site. Development of lands beyond these areas will require new municipal infrastructure. Similarly, existing services will limit the ultimate expansion of the ATB and commercial development. There are significant challenges involved in providing new infrastructure, such as down-stream capacity.

4. The development of major airside projects such as the extension of existing runways is limited because of approach zoning limitations imposed by existing hydro corridors, existing and proposed transportation corridors and land ownership issues.

## **6.2 AIRPORT / COMMUNITY INTERFACE**

Achieving an appropriate and balanced interface between the Airport and the surrounding community is an important key to both the long-term viability of the Airport and the well being of the community. The interface between Airport and community touches upon a number of critical elements. These include consideration of future noise impacts, land use planning and vehicular traffic.

Amendments to the Hamilton Official Plan and the implementation of the Airport Employment Growth District (AEGD) Secondary Plan, will help to guide surrounding lands in a manner which is compatible with the long term operation of the Airport. Other portions of surrounding land will remain under the Rural Hamilton Official Plan and are identified as agricultural.

The City of Hamilton has implemented an Airport Influence Area which restricts development of residential sites within the 28 NEF contour.

### **6.2.1 Noise Impacts**

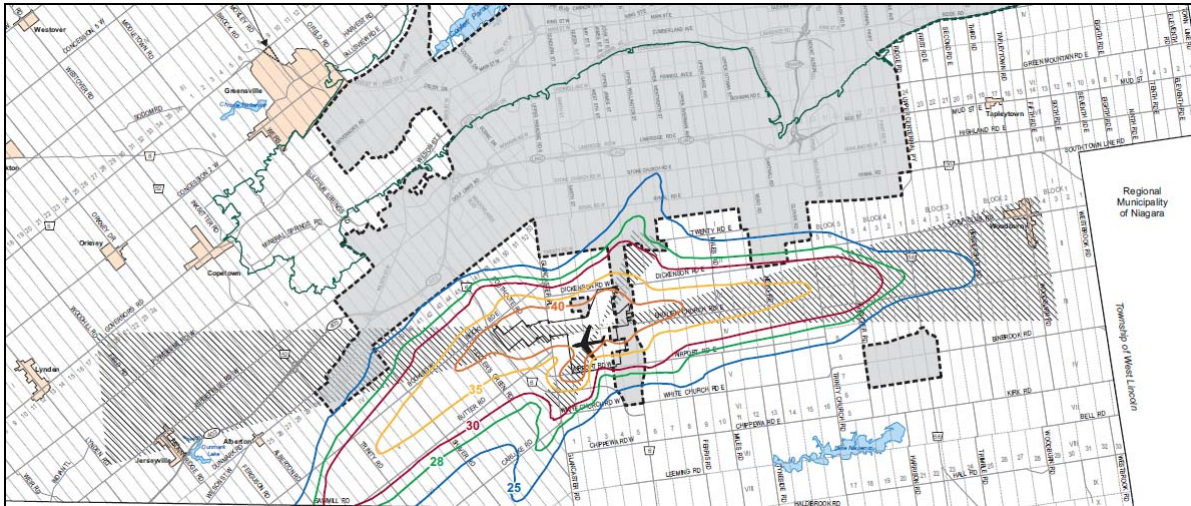
It must be recognized that much of the current and potential success of Hamilton International Airport is derived from courier activities, which rely upon the Airport's 24-hour operation. The level of nighttime activity associated with these activities dictates a greater sensitivity to minimizing noise impacts on the community. Although recent changes in aircraft engine technology have made new turbine aircraft substantially quieter, the public is also becoming more sensitive to aircraft noise. The public sensitivity towards nighttime activities at Hamilton International dictates that a greater level of separation is required between the Airport and non-compatible land uses.

In Canada, the only officially recognized model used for the analysis of noise impact is Transport Canada's Noise Exposure Forecast Computer Program (NEFCAL). As part of the original 1999 Airport Master Plan study, NEFCAL was used to assess both current and projected noise impacts. The Noise Exposure Forecast (NEF) and the Noise Exposure Projections (NEP) analysis was undertaken for both the current and forecasted aircraft movements in order to assess the potential impacts that may be associated with the further development of the Airport.

An updated NEF study was completed in 2006. The study projected that noise exposure contours will expand until 2015 due to increases in itinerant traffic, but would shrink considerably from 2015 to 2025. The shrinkage of the contours would be largely the result of the introduction of quieter aircraft. The extension of Runway 06 would also contribute to a general reduction of noise disturbance in the vicinity of the Airport.

Figure 6.2 illustrates the official NEF contours generated from the 2006 study.

**Figure 6.2 NEF Contours**



The actual noise footprint and impact on the community has not increased since 2006 study. Therefore, no update to the noise model was completed as part of this 2010 Airport Master Plan Update. Appendix 'B' contains the Hamilton International Airport Noise Impact & Evaluation Study completed in 2006.

## 6.2.2 Noise Related Conclusions

From the NEF/NEP analysis prepared as part of the 2006 NEF study, it can be generally concluded that the long term impact of noise on the surrounding community will generally diminish despite potential increases in the number of movements. The primary reason for a potential reduction in noise impacts is the introduction of new aircraft engine technologies.

The expansion of Runway 06-24 to 2,743 m will certainly mitigate noise impacts on the community. The expansion of this runway would increase opportunities for alternate runway configurations to be used for the arrival and departure of aircraft, especially during nighttime operations. At present, the runway is not long enough to accommodate the larger aircraft that operate into the Airport. With the runway's expansion, the use of alternate runway configurations could be used as a means to balance noise impacts within the surrounding community.

With regard to noise impacts, it is recommended that on-airport lands be reserved and additional lands be acquired by the City of Hamilton for the extension of Runway 06-24 in the long term airside development.



### **6.2.3 Noise Management Plan**

Noise impacts on the community can be further diminished with the implementation of a proper Noise Management Plan. The primary objective of a noise management plan is to mitigate noise impacts to their lowest possible level while recognizing legitimate operational and safety requirements. Hamilton International has adopted a noise management plan. Mitigation measures in the plan include the following:

#### **Aircraft Flight Tracking and Noise Monitoring System (AFTNS)**

This system was installed in February 1997 and consists of microphones strategically placed in the community that provide decibel readings that can then be correlated to radar information that displays the movement of aircraft to and from the Airport. The AFTNS system can determine if aircraft are properly executing noise abatement procedures and can be used to fine tune operational procedures that will mitigate noise impacts.

#### **Noise Abatement Procedures**

Noise abatement procedures have been implemented for nighttime arrivals and departures. These procedures are published by Transport Canada and must be adhered to by all applicable aircraft. The procedures mitigate noise impacts by enforcing pilots to follow specified procedures that divert aircraft away from residential land uses and/or reduce the noise profile of the aircraft. These procedures cover takeoff and landing procedures, preferential runways, hours of operation, and use of reverse thrust.

#### **Ground/Maintenance Operations Directives**

These directives cover ground servicing and aircraft maintenance operations such as engine run-ups, and establish protocols with respect to when and how work may be carried out.

#### **Consultation**

The Noise Management Plan establishes protocols with respect to consultation with the aviation industry, air traffic control and the public regarding the matter of noise. The objectives of the consultation process are to monitor the performance of the noise mitigation measures and provide viable solutions to concerns.

### **6.2.4 Land Use Planning**

The economic viability of the Airport is dependent upon a proper interface between community and Airport. Defining appropriate land uses surrounding the Airport is a key element in achieving this interface.

The two land use components that must be considered in the Airport Master Plan are:

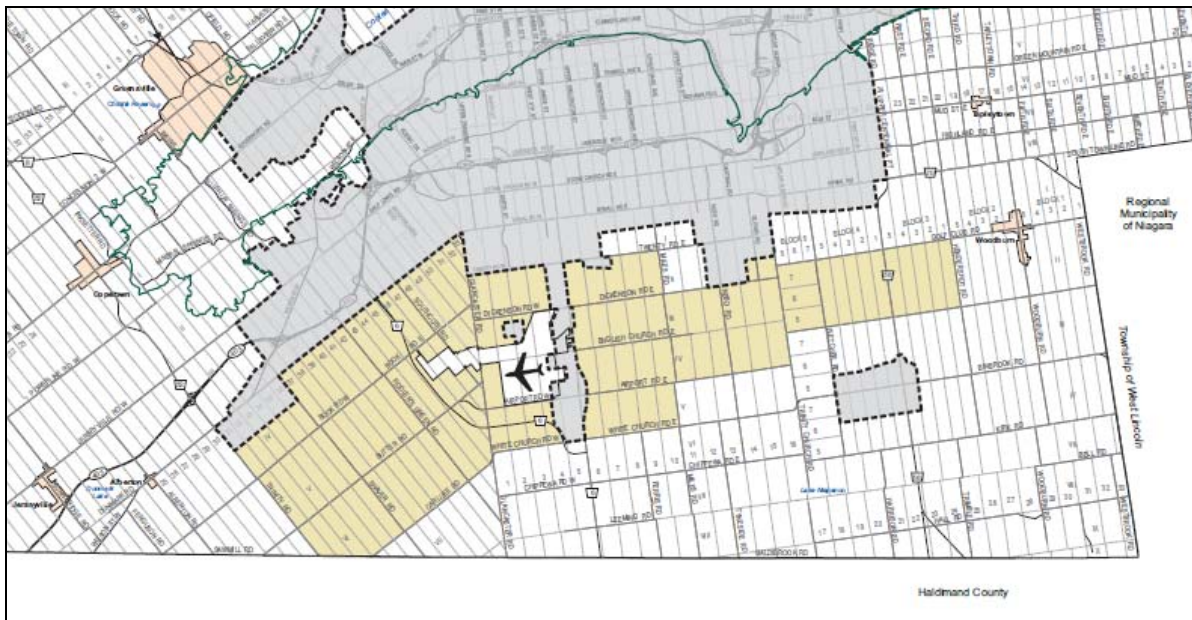
- Identification and designation of non-conflicting land uses surrounding the Airport.
- Identification of land areas to be protected against the erection of obstacles that could jeopardize the licensing and operation of the Airport in its final configuration.

With respect to the designation of non-conflicting land uses, City of Hamilton Official Plans should have due regard for recent changes in provincial policy regarding the development of residential and other noise sensitive land uses in the vicinity of airports.

Policies should include:

- Not permitting new residential development and other sensitive land uses to be developed within areas exposed to noise disturbance levels greater than 28 NEF;
- That any sensitive land uses developed between NEF 25 and NEF 28 contours implement noise mitigative measures in accordance with provincial and federal guidelines and standards;
- For lands designated as agricultural, that re-designation of these lands to residential uses not be permitted in areas identified as NEF 25 or greater;
- That the City of Hamilton Airport Influence Area include those lands identified under the NEF 28 contour or greater based on the 2006 NEF contours. The current Airport Influence area is illustrated in Figure 6.3.

**Figure 6.3 Airport Influence Area**



Source: City of Hamilton

### 6.2.5 Registered Airport Zoning

The Hamilton Airport Zoning Regulations is a federally legislated document designed to protect the existing and future approach and departure flight paths from both natural and man-made obstructions. All owners of land parcels described within the airport registered zoning regulations must abide by the restrictions and covenants as written in the regulations. The Hamilton Airport Zoning Regulations can be found at the Land Registry Office in Hamilton.

Hamilton International Airport Limited, through Public Works and Government Services Canada, is in the process of amending the current Registered Zoning for the Airport. These amendments would provide protection for the eventual extension of Runway 06-24 to 2,743 m., and the elimination of displacements on Runway 12-30. It is anticipated that the revised Registered Airport Zoning will come into affect sometime within the next 2 to 3 years. Figure 6.4 illustrates the protective zoning required to meet future Obstacle Limitation Surfaces (OLS). Figure 6.5 illustrates electronic zoning requirements.

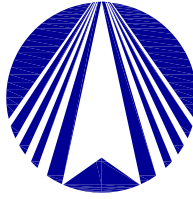








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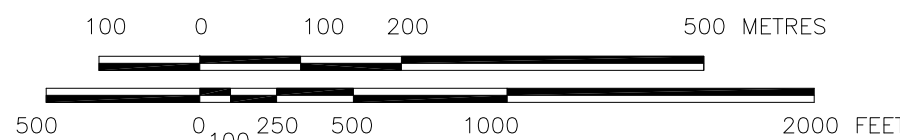
Revisions				
No.	Description	By	Appd.	Date
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SCALE 1:7500  
ON 24"x36" (ARCH D)



100 0 100 200 500 METRES  
500 0 100 250 500 1000 2000 FEET

**GENERAL LEGEND**

	EXISTING AIRPORT PROPERTY		EXTENDED RUNWAY CENTRELINE
	FUTURE LAND ACQUISITIONS		EXISTING LEGAL BOUNDARY
	EXISTING STRUCTURE / BUILDING		EXISTING ROAD
	EXISTING AIRSIDE PAVEMENT		FUTURE ROAD
	FUTURE AIRSIDE PAVEMENTS		FUTURE AIRSIDE PAVEMENTS
	FUTURE STRUCTURE / BUILDING		FUTURE RUNWAY END SAFETY AREA
			ELECTRONIC ZONING - LOCALIZER
			ELECTRONIC ZONING - GLIDE PATH
			ELECTRONIC ZONING - VHF/UHF COMM
			ELECTRONIC ZONING - RADAR

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**HAMILTON INTERNATIONAL AIRPORT  
20 YEAR MASTER PLAN UPDATE**

Hamilton, ON

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**FIGURE 6.5  
HAMILTON INTERNATIONAL AIRPORT  
FUTURE ELECTRONIC ZONING**

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Revision	1	Drawing No.	FIG 6.5
		Project No.	06349



### 6.2.6 Landside Access

It is important that airport vehicle traffic does not negatively impact local communities, including the Village of Mount Hope. In this regard, the proposed road system described under the Airport Master Plan minimizes the requirement for vehicles to travel through the community. Where possible, transportation corridors will be provided directly from existing Highway 6 and New Highway 6. In order to implement a road access system that will minimize the Airport's impact on the community it is recommended that:

- As vehicular traffic demands in the future that the New Highway 6 Airport Expressway is expanded to 4 lanes with full interchanges (replace intersection at Book Road), and a new interchange at Butter Road.
- The City of Hamilton initiates the process of acquiring lands to accommodate the eventual extension of Dickenson Road from Glancaster Road to Book Rd.
- Consideration be given to a new service road that would be located north of the New Highway 6 Expressway between the Terminal Access Road and Butter Rd. The purpose of this road would be to ensure the continuity of Airport Road once Runway 06-24 is expanded.
- Consideration be given to creating a direct eastern link from the Airport (Hwy 6 New) to the new Red Hill Creek Parkway / Lincoln Alexander Parkway to ensure suitable road access for those customers accessing the Airport from the QEW and vice versa. This will reduce the negative impact of airport traffic on the local businesses located along Upper James and Highway 6.
- In the medium term, the Book Road Intersection be expanded into a full interchange, eliminating the need to stop traffic on the New Highway 6.
- In the medium to long term, the City of Hamilton give consideration to linking the Airport with Light Rail Transit systems proposed for the region.

## 6.3 LAND USE DESCRIPTIONS

The primary intent of this Airport Master Plan Update is to describe in detail the land uses and guidelines required for the appropriate development of Hamilton International Airport. The Master Plan must address short-term concerns, while at the same time providing flexibility for the long term future of the Airport.

Additional airport lands are required in the short to medium term to accommodate expansion of airside infrastructure and to accommodate future commercial development. Land use adjacent to the Airport property must be zoned accordingly to ensure appropriate land uses in the vicinity of the Airport. This has been adequately addressed in the AEGD Secondary Plan.



### **6.3.1 Airside Operations & Reserve**

Airside Operation applies to those lands that are currently used or required for the safe movement of aircraft and for the protection of electronic and visual navigation aids.

At present, the Airport has a capacity of approximately 140,000 to 426,000 aircraft movements depending on the mix of IFR and VFR traffic. With the introduction of parallel taxiways and high-speed exits, this capacity can be further increased and airside efficiency and safety considerably enhanced.

Within the time frame of the Airport Master Plan, it is not anticipated that demand will ever approach the current airfield runway capacity. The construction of an additional runway is not being considered as a component of the 2010 Airport Master Plan Update.

The Master Plan, does recognize a short-to-medium term need for the Airport to enhance its all-weather capabilities. To accomplish this objective Runway 06-24 needs to be expanded as it is the preferred in-wind runway during IFR conditions. Expansion of the runway needs to be complimented with the installation of appropriate approach and navigational aids to support its operation under minimal weather conditions.

With respect to airside development, the objectives of the Airport Master Plan are:

- Rehabilitate and maintain existing airside infrastructure.
- Enhance the operational efficiency and safety of the existing runway and taxiway system.
- Enhance the all-weather capability of the Airport.
- Provide flexibility for the future expansion of the existing airside infrastructure to provide improved operating efficiencies for existing air carrier operators and to provide new opportunities for the use of larger aircraft and longer stage lengths.
- Provide airside access to new airside commercial development areas.
- Accommodate the expansion of Runway 06-24 to 2,743 m (9,000 ft.).

#### **Short term airside projects (2011 - 2015) include:**

- Resurfacing of Runway 12-30.
- Rehabilitation of Runway 06-24.
- Provision of ODALS on Runway 06.
- Expansion of Taxiway Delta.
- Construction of new taxiway east from Apron III to accommodate expanded commercial development.

**Medium term airside projects (2016 - 2020) include:**

- Expansion of Runway 06-24 to 2,743m (9,000 ft.).
- Provision of Runway Emergency Stop Areas (RESA's) at the ends of all runways.
- Upgrading existing portions of Runway 06-24 to PLR 12.
- Provision of CAT II ILS on Runway 06.
- Upgrade of ILS on Runway 12 to CAT III.
- Construction of parallel taxiway to Runway 12-30.
- Construction of parallel taxiway to runway 06-24.

**Long term airside projects (2021 - beyond) include:**

- Extension of Taxiway Whisky to accommodate future air cargo development.
- Construction of new taxiway to serve future General Aviation development west of Runway 06-24.
- Construction of high speed exits on Runway 12-30 and Runway 06-24.
- Extension of Runway 12-30 to 3,353 m (11,000 ft.) to accommodate very long range cargo flights. (very long term project)

All of the airside development projects identified above can be accommodated within the existing boundaries of the Airport with the exception of the extension of Runway 06-24 and the construction of Taxiway Whisky east of the existing airport property boundary. The extension of Runway 06-24 to 2,743 m will require both the partial closure of Airport Road and the acquisition of additional land. The minimum land required to accommodate this expansion is approximately 32.2 ha. The City of Hamilton is currently in the process of acquiring these lands.

### **6.3.2 Airport Terminal & Reserve**

With a capacity to accommodate approximately 800,000 to 1,000,000 million annual passengers, the current terminal facility will likely meet forecasted demands until approximately 2012 - 2017. Beyond that period, the terminal will have to be expanded to accommodate additional processing capacity. This assumes that passenger activity will grow as projected in the 2008 Air Traffic Forecast. It is important to note that any expansion of the terminal facilities will be driven by actual increases in passenger activity rather than calendar milestones. Table 6.1 describes the floor area and gates associated with future phases of terminal development.

<b>Table 6.1      ATB Expansion – Phase 2 &amp; Phase 3</b>		
	<b>Phase 2</b>	<b>Phase 3</b>
<b>Floor Area (m<sup>2</sup>)</b>	13,500	25,775
<b>Gates</b>	7	12

Passengers at hi are currently provided with convenient and efficient access between the parking lot and the aircraft. This aspect, which promotes the Airport as a user friendly experience, is a distinct strength of the Airport that should be enhanced.

The Airport Master Plan identifies a reserve area associated with the existing terminal building and groundside areas that can accommodate a substantial expansion to the existing facilities. Sufficient lands are currently available to accommodate an expansion through Phase 3.

The intent is to allow general aviation activities to remain in Hangars 2 and 3 throughout Phase 2 and 3 so long as their presence does not impact the operation of the expanding ATB.

### **6.3.3 Airport Support & Reserve**

Airport Support services are those required to support the operations of the Airport. These include airport maintenance, crash/fire, security, air traffic control and fuel farms. The services are provided by both the airport administration and by outside agencies such as Nav Canada.

For airport support services, the objectives of the master plan are:

- Reserve sufficient lands for airport support functions and provide appropriate facilities.
- Locate and provide airport support services in an efficient and cost effective manner.
- Ensure that the provision of airport support facilities does not impede future commercial development.

The Airport Master Plan Update recognizes that sufficient lands should be provided adjacent to the existing airport support facilities to provide the flexibility necessary to accommodate future expansion. Although alternate sites were considered, continued operations at the existing site are preferred due to its central airside location and the high cost of relocation.

### **Airside Operations Combined Services Facility**

In the short term, expansion of the airside operations and combined services facility is required in order to accommodate the storage of heavy airport maintenance equipment. With the medium to long term expansion of airside pavements, further additional equipment and storage expansion will be necessary.

The Airport has also identified a need to provide a new sand and shelter within the next 5 years.

With respect to airside access and response time, the existing fire hall is appropriately located. Consideration should be given to the expansion of additional apparatus support facilities. Should the Airport be required to meet Category 9 emergency response, additional apparatus bays would be required in order to accommodate larger crash vehicles.

### **Fuel Farm**

The existing fuel farm has the capacity to serve the current and near-term needs of the Airport with additional lands available to double the current fuel storage capacity. Future expansion of the fuel farm would be the responsibility of the fuel consortium which operates the facility.

### **Control Tower Facility**

Nav Canada has indicated the existing control tower facility has the capability to serve the existing and anticipated needs of the Airport. No expansion of the facility is seen within the time frame of the Master Plan. The short and long term development of the Airport takes into account the tower's line of sight requirements to both the existing and proposed aircraft maneuvering surfaces.

## **6.3.4 Airside Commercial & Reserve**

Airside Commercial activities at Hamilton International encompass a wide range of activities that require direct access to the airside operational areas. These activities include:

- Aircraft ground servicing and support.
- Storage and maintenance.
- Air cargo / courier activities.
- Fixed Base Operations.
- Charter services.
- Flight Training

For airside commercial development, the objectives of the Master Plan are to:

- Reserve adequate land for future expansion of airside related commercial activities with a focus on air cargo and courier operations, hangar and aircraft maintenance facilities.
- Accommodate short-term demand for land within existing airport boundaries without compromising long-term flexibility.
- Provide for landside access to airside commercial development areas from existing arterial roads and the New Highway 6 Airport Expressway.
- Provide sufficient lands adjacent to airport-related commercial development to accommodate opportunities for inter-modal distribution and value added processing.

The priority of airside commercial development will be in the areas of hangar and aircraft maintenance facilities as well as air cargo / courier activities and other activities associated with the air cargo/courier industry. It is not anticipated that there will be significant growth in light general aviation activity.

At present, there is a shortfall of air cargo related commercial development. The *Airport Market Analysis and Land Needs Study* identifies a potential requirement for approximately 42 ha of land development supporting approximately 75,000sm of air cargo/courier facilities<sup>13</sup>. This includes both potential expansions to existing facilities plus the development of new infrastructure. To support the expansion of cargo-related activity, the Airport has identified the need for a cross dock facility which could be leased to multiple tenants. The proposed location for such a facility would be on existing airport land located immediately east of the Apron III, adjacent to the fuel farm.

To meet forecasted long term commercial development requirements, additional lands beyond the present airport boundary will be required. The *Airport Market Analysis and Land Needs Study* identifies a requirement for an additional 114 ha of land. Opportunities to expand the Airport include lands located east of the present airport boundaries and lands located between Runway 12-30 and Dickenson Road. These lands on the east side of the Airport must be serviced by the appropriate utilities and roads before becoming available for development.

In the long term, air cargo / courier facilities could be accommodated on lands located adjacent to Dickenson Road. Earlier development of these lands may also be desirable from an operational perspective. The location of air cargo activities in this area would minimize taxiing distances for larger aircraft using Runway 12-30, and would reduce congestion associated with aircraft movements in the terminal area. If in the future, if Dickenson Road is connected directly to New Highway 6, the commercial lands located north of Runway 12-30 will have excellent landside access, furthering its desirability for courier / air cargo operations.

Much of the lands south of Dickenson Road and north of the airport boundary have been identified as 'Airport Related Business' (ARB) under the AEGD and would be utilized for

<sup>13</sup> Airport Market Analysis and Land Needs Study, Tables 7.2/7.3, Dillion Consultants, 2009



commercial uses which may require airside access to the Airport. This would include air cargo and courier operations.

The land along the northern limit of Hangar Road associated with Hangar 2 and 3 can, for the medium term, remain as airside commercial and can be redeveloped as required for this purpose. However, in the long term these lands, with the exception of Hangar 1, are identified as Terminal Reserve.

### **6.3.5 Non-Airside Commercial & Reserve**

To support the vision of Hamilton International becoming a major cargo hub and inter-modal facility, the City of Hamilton has proposed that lands within the AEGD accommodate a full range of associated activities such as freight warehousing, distribution, and value added processing. In addition, there are a number of commercial, retailing, and hospitality activities that also benefit from their proximity to an airport.

With respect to non-airside commercial development, the objectives of the Airport Master Plan Update are to:

- Reserve adequate land for future aviation and non-aviation commercial land uses that do not require direct airside access.
- Provide sufficient land to implement innovative cargo development, related distribution and other value-added processing opportunities.
- Provide opportunities for inter-modal activity through direct adjacency between airside and non-airside commercial activities.
- Provide direct access to main transportation networks.
- Provide airport-related commercial development in a manner that is compatible with City of Hamilton's Official Plan.

Under the Airport Master Plan Update, the definition of non-airside commercial development includes those activities that require or benefit from the presence of the Airport, but do not require direct access to the airside. These activities include:

- Freight distribution facilities
- Sort facilities
- Light manufacturing/processing
- High technology industries
- Warehousing
- Commercial offices
- Hospitality services including restaurants, hotels, convention facilities
- Communication activities

- Car rental/servicing facilities
- Flight kitchens
- Gas stations
- Airline support facilities.

In the short to medium term, the development of non-airside commercial development could occur on lands that run adjacent to and west of Highway 6 / Homestead Drive. These lands include the Airport Business Park (24 ha.) and are presently designated under the City's Official Plan for the uses described above. In the longer term, non-airside commercial development has been identified for lands south of Dickenson Road.

With the development of New Highway 6 will arise an opportunity to develop lands south of Airport Road in the vicinity of the New Highway 6 / Airport Access Road intersection. Lands located south of Airport Road, and on either side of the New Highway 6 access should be developed for non-airside commercial development. Under the AEGD, these lands are designated as 'Airport Related Commercial' (ARC) and include uses such as hospitality accommodation, offices, business and finance services.

Under an affiliated company, Tradeport owns a 23 ha parcel of land south of Airport Road and west of the access to New Highway 6. The intention in the long term is to develop this land for commercial uses. In the short term it could be used for remote parking should demand warrant additional capacity.

Under the AEGD airport-related commercial development will be allowed to occur on lands located west of the Airport between New Highway 6 and the existing airport boundary.

### **6.3.6 General Commercial Reserve**

General commercial development describes commercial activities that are not airport related. These activities are directed towards the surrounding community. These activities include:

- Retail and service commercial
- Personal and business services
- Recreational and entertainment facilities
- Restaurants and Taverns
- Hotels and motels
- Cultural, community and institutional uses that do not conflict with commercial intent of designated lands
- Residential as a component of a permitted use.

With respect to general commercial development, the objectives of this Airport Master Plan Update are to:

- Accommodate adequate land for future expansion of general commercial development within the Mount Hope Urban Area.
- Provide general commercial development in a manner that is compatible with the official plans of the City of Hamilton.

Under the *Airport Market Analysis and Land Needs Study*, it is assumed that the highest and best use of available lands within the Airport's boundary would be for airside commercial development including air cargo, general aviation and airline support functions. Although there will be a requirement to accommodate some commercial functions which do not require airside access, it is anticipated that much of this type of activity will be located outside of the Airport boundary as identified in the AEGD.

## **6.4 SERVICING**

### **6.4.1 Sanitary Sewers**

The existing airport sanitary sewer system will provide service for airport commercial development located in the area between Airport Road and the old hangar line.

Sanitary services for potential airport commercial development south of Airport Road can be provided through the 450 mm diameter trunk sanitary sewer located on Airport Road.

Sanitary services for proposed airport/ airside commercial development fronting on Airport Road and east of the Canadian Warplane Heritage Museum can be provided through the 450 mm diameter trunk sanitary sewer located on Airport Road, or the existing 300 mm diameter sanitary sewer on the East Cargo Road.

Sanitary services for future airport commercial development adjacent to the Westjet facility have been extended along East Cargo Road utilizing a combination of gravity and force mains. This work was completed in 2002. Sanitary services for future airport commercial development fronting onto future extensions of the East Cargo Road, can be provided by construction of a new sanitary sewer extending from the existing limit of East Cargo Road to Upper James St.. The proposed sewer would connect to the existing large diameter sanitary sewer on Upper James. Land acquisitions to the east would be required and a servicing easement established.

There is no sanitary sewer servicing available on Dickenson Road. Therefore, a proposed sewer and/or sewage pumping station that would connect to the sanitary sewer on Upper James Street would provide sanitary services for future airport commercial development fronting onto Dickenson Road West.

Due to the capacity of the sanitary pumping station located approximately 1,200 meters North of Airport Road West, the City of Hamilton has placed a restriction of 53 liters per

second for peak discharge from the Airport. Therefore, existing and future sanitary sewage demands and allocations should be reviewed and upgrading of the City's sewage collection system or other innovative solutions (i.e. wetland treatment systems) will be required to accommodate future long-term airport development. These requirements should be included in the City of Hamilton's Municipal Services Master Plan and AEGD secondary planning processes.

#### **6.4.2 Water Services**

The existing and new airport water mains will provide services for future airport commercial development located between Airport Road and the old hangar line.

Water services for future airport/airside commercial development south of Airport Road can be provided through the existing 400 mm and new 600 mm diameter trunk water mains located on Airport Road.

Water services for future airport commercial development fronting on to Airport Road, east of the Canadian Warplane Heritage Museum can be provided through the 400 mm diameter trunk water main located on Airport Road, or the existing 250 mm diameter water main on the East Cargo Road.

Water services for future airport commercial development adjacent to the WestJet facility have been provided in 2002 by extending the existing 250 mm diameter water main east on East Cargo Road. This service provides a dead end condition and could be improved if connected via a future service easement towards Homestead Drive.

Water services for future airport commercial development fronting onto the Highway 6, can be provided by a proposed service that would connect to the existing 400 diameter water main on Highway 6.

The existing 150 mm diameter water main on Dickenson Road will provide servicing for future airport commercial development fronting onto Dickenson Road West.

#### **6.4.3 Stormwater Drainage**

The *Stormwater Management Systems Review*<sup>14</sup> undertaken in 2009 provided a number of recommendations and comments with respect to stormwater management related to future expansion of the Airport. These recommendations and comments included:

- That a series of stormwater management facilities be located around the perimeter of the Airport where external drainage areas enter airport lands.

<sup>14</sup> Stormwater Management Systems review, Hamilton International Airport, Weslake, 2009

- That future development take into consideration rooftop storage, parking lot storage, and infiltration ditches in order to maintain groundwater recharge and reduce the size and number of storm water management ponds located on the Airport.
- That the Airport provide input to the City of Hamilton with respect storm water management associated with the Airport Employment Growth District
- The Airport consult with the Niagara Peninsula Conservation Authority (NPCA) as the expansion of the Airport will have implications with respect to water quality, erosion control and water quality targets associated with the NPCA's "Twenty Mile Creek Watershed Plan".
- That consultation is required with the Ontario Ministry of Transportation (MTO) to confirm design of any outlets that may impact MOT right-of-ways.

## 6.5 LAND ACQUISITION REQUIREMENTS

At present, Hamilton International Airport has limited lands on which to accommodate commercial development and airside expansion. In order to accommodate the Airport's expansion requirements, it is recommended that the City of Hamilton acquire lands adjacent to the Airport.

Table 6.3 identifies additional airport land requirements as summarized in the *Airport Market Analysis and Land Needs Study*.



**Table 6.2 Airport Land Acquisition Requirements**

Function	Additional Airport Land Needs (Ha)	Growth Strategy
Airfield Reserve	70	<ol style="list-style-type: none"> <li>1. Expand boundary westerly to accommodate extension of runway 12-30 including Runway End Safety Area (RESA) and approach lighting.</li> <li>2. Expand boundary southerly to accommodate extension of Runway 06-24 including Runway End safety Area (RESA), approach lighting</li> </ol>
Air Terminal Reserve	26	<ol style="list-style-type: none"> <li>1. Expand existing air terminal site westerly and southerly displacing old hangars, parking areas, buildings to West Cargo Rd.</li> <li>2. Develop major parking facilities south of Airport Rd. and east of East Cargo Rd.</li> </ol>
Airport Support	0	<ol style="list-style-type: none"> <li>1. Expand airport firehall and maintenance facilities in current location.</li> <li>2. Relocate ground support in vicinity of air terminal</li> </ol>
Airport Commercial	114	<ol style="list-style-type: none"> <li>1. Expand boundary southerly beyond Airport Rd. to Highway 6 to accommodate airline support facilities.</li> <li>2. Expand boundaries of East Cargo Area to accommodate additional cargo facilities.</li> <li>3. Expand boundary westerly towards Glancaster Road to accommodate general aviation facilities and to segregate traffic by type, size and operational requirements.</li> <li>4. Provide commercial reserve east of existing boundary to accommodate overflow from airline and air cargo zones if required</li> </ol>
<b>TOTAL</b>	<b>210</b>	
Source: Airport Market Analysis and Land Needs, Dillon Consulting Ltd. 2009		

## 6.6 IMPLEMENTING / PHASING

The phasing of airside development proposed under this Airport Master Plan is illustrated in Figure 6.6. The development of airside and non-airside commercial land uses identified in the development concept will be dependent upon the demand for such lands.

In the short term, development of airside commercial uses will be accommodated within the existing boundaries of the Airport, most likely adjacent to the existing tenant base that require additional facilities for growth, with the exception of lands along the New Highway 6 Airport access corridor that are located outside the airport boundary.

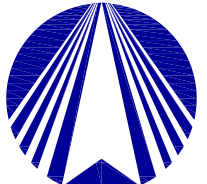
In the medium to long term, there will be a need to expand airside development beyond the present airport boundaries. With respect to the phasing of commercial development, there are a number of alternatives, which can be accommodated in the development concept. Although medium-term development has been identified in the southeast quadrant of the Airport, the potential also exists, for such development to take place on lands located between Dickenson Road and Runway 12-30. The development of these lands in the medium term would, however, require the provision of additional services.

Implementation of airside improvements in the short term is in direct response to existing operational constraints. The implementation and phasing of airside projects in the medium to long term will depend on a number of factors including future growth in annual aircraft movements and the future mix of aircraft. Expansion of the airside infrastructure will only be undertaken when there is a demonstrated need for such improvements. Specific measures however, should be undertaken by both HIAL and the City of Hamilton to ensure that the full airport development proposed in the Airport Master Plan is protected.





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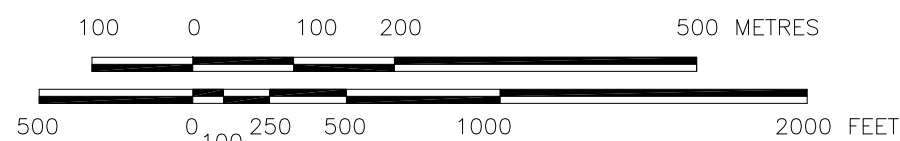
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Revisions				
No.	Description	By	Appd.	Date
0	FIRST DRAFT	JJH	GB	DEC-2010
1	FINAL REPORT	JJH	GB	APR-2011

Notes

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- EXISTING AIRPORT PAVEMENTS BASED ON THIRD PARTY DATA.
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SCALE 1:7500  
ON 24"x36" (ARCH D)



**GENERAL LEGEND**

	EXISTING AIRPORT PROPERTY		FUTURE RUNWAY END SAFETY AREA
	FUTURE LAND ACQUISITIONS		FUTURE AIRSIDE PAVEMENTS SHORT-TERM (0-5 YEARS)
	EXISTING STRUCTURE / BUILDING		FUTURE AIRSIDE PAVEMENTS MEDIUM-TERM (5-10 YEARS)
	EXISTING AIRSIDE PAVEMENT		FUTURE AIRSIDE PAVEMENTS LONG-TERM (10-20 YEARS)
	FUTURE STRUCTURE / BUILDING		FUTURE AIRSIDE PAVEMENTS VERY LONG-TERM (20+ YEARS)
	EXTENDED RUNWAY CENTRELINE		
	EXISTING LEGAL BOUNDARY		
	EXISTING ROAD		
	FUTURE ROAD		

Client/Project

**HAMILTON INTERNATIONAL AIRPORT  
20 YEAR MASTER PLAN UPDATE**

Hamilton, ON

Title

**FIGURE 6.6  
HAMILTON INTERNATIONAL AIRPORT  
FUTURE DEVELOPMENT PHASING PLAN**

Designed by:	JJH	Scale	1:7500 (24X36 SHEET)
Own by:	JJH	Reviewed by:	GB
Revision	1	Drawing No.	FIG 6.6
		Project No.	06349



## 7.0 Environmental Management

### 7.1 ENVIRONMENTAL MISSION STATEMENT

Hamilton International Airport strives to meet or exceed all applicable regulations, codes, guidelines and municipal bylaws and is committed to operating and maintaining the Airport in an environmentally responsible manner.

The Airport is committed to environmental protection and to providing a safe and healthy workplace for employees, tenants, customers and the general public.

### 7.2 GOALS AND OBJECTIVES

Hamilton International Airport currently has in place an Environmental Management Plan. The primary goal of the plan is to "ensure that hi operates in an environmentally responsible manner according to applicable laws and regulations, accepted management practices and with sensitivity to community and public concerns",

The objectives of the Environmental Management Plan are:

- To establish and maintain Hamilton International Airport as an environmentally responsible and sustainable facility.
- To ensure compliance of all environmental legislation and guidelines.
- To inform all airport tenants and employees of their environmental responsibilities in order to achieve the above objectives.
- To familiarize the public with the Airport's environmental policies.
- To ensure that all parties understand the concept of sustainable growth.

### 7.3 ENVIRONMENTAL MANAGEMENT PRACTICES AND PROCEDURES

The Environmental Management Plan prepared by HIAL identifies the management and implementation strategies associated with a number of environmental issues at the Airport. Each issue identified in the plan is provided with a strategy that outlines the due diligence required to ensure that environmental objectives are met. In addition to this, the Airport has an Emergency Procedures Plan that identifies contingency procedures to be followed in the event of an environmental emergency.

It should also be noted that any required Environmental Assessment studies will be finalized, as required, prior to implementation of infrastructure expansion. Furthermore, alternative solutions to the infrastructure problems/opportunities will be further reviewed during the Class EA process.

## 8.0 Recommendations

The 2010 Airport Master Plan Update has supplemented and updated the recommendations identified in the 2004 Airport Master Plan. They include:

### 8.1 AIRPORT / COMMUNITY INTERFACE

It is recommended that:

#### 8.1.1 Noise Considerations

- 8.1.1.1 Consistent with past practice, that the Noise Exposure Forecasts be updated when significant changes to activity levels, aircraft mix and/or operational procedures have been identified or are anticipated.
- 8.1.1.2 The City of Hamilton, over time, purchase residential properties located immediately adjacent to the Airport on lands that have been identified as Airport Reserve through the AEGO secondary study.
- 8.1.1.3 The City of Hamilton enforce the 'Airport Influence Area' with respect to new development and modify the extent and intent of Airport Influence Area as may be required in the future to ensure the compatibility land use surrounding the Airport.
- 8.1.1.4 Amendments to the current Registered Airport Zoning for the Airport, currently being undertaken, be implemented to accommodate the extension of Runway 06-24 to 2,743 m (9,000 ft.).
- 8.1.1.5 The City of Hamilton identify land areas to be protected against the erection of obstacles that could jeopardize the licensing and operation of the Airport in its final configuration and support this protection through the application of appropriate municipal by-laws and zoning controls.

#### 8.1.2 Registered Airport Zoning

It is recommended that:

- 8.1.2.1 Amendments to the current Registered Airport Zoning for the Airport, currently being undertaken, be implemented to accommodate the extension of Runway 06-24 to 2,743 m.
- 8.1.2.2 The City of Hamilton identify land areas to be protected against the erection of obstacles that could jeopardize the licensing and operation of the Airport in its final configuration and support this protection through the application of appropriate municipal by-laws and zoning controls.



### **8.1.3 Airport Ground Access**

It is recommended that:

- 8.1.3.1 The City of Hamilton initiate the process of acquiring lands required to accommodate the eventual extension of Dickenson Road to Book Road.
- 8.1.3.2 The City of Hamilton develop a new service road to be located north of the New Highway 6 right of way between the Terminal Access Road and Butter Road. This road will be required when Runway 06-24 is extended.
- 8.1.3.3 The City of Hamilton develop a new road that would be intended for the access of future airside and airport commercial developments located east of the current airport boundary and west of Existing Highway 6.
- 8.1.3.4 The City of Hamilton construct an eastern link to the new Red Hill Creek Parkway / Lincoln Alexander Parkway intersection to improve road access between the Airport and the QEW (from the east).
- 8.1.3.5 The City of Hamilton continue development work for the future provision of light rail transit to the Airport, via the A-Line corridor.
- 8.1.3.6 Hangar Road be reconstructed to accommodate traffic access and provide proper stormwater drainage.
- 8.1.3.7 The East Cargo Road be realigned to accommodate the development of commercial lands located immediately east of Apron III.

## **8.2 LAND USE**

It is recommended that:

### **8.2.1 Airside Reserve**

- 8.2.1.1 Hamilton International Airport Limited should give consideration to the development of the following projects in the short term (1 to 5 year timeframe):
  - Resurfacing of Runway 12-30.
  - Rehabilitation of Runway 06-24.
  - Provision of ODALS on Runway 06.
  - Extension and upgrading of Taxiway Delta to Code D standards to serve expanded commercial development.

- Construction of new taxiway located east from Apron III to serve expanded commercial development.
- Construction of new taxiway to serve future General Aviation development west of Runway 06-24.
- Provision of additional airside perimeter roadways; wild life control roads, and emergency access roads to provide maintenance and emergency access.
- That the City of Hamilton give consideration to the acquisition of lands located south of Airport Road and north of the proposed New Highway 6 Airport access corridor, to accommodate potential expansion of airside and terminal reserve infrastructure.

8.2.1.2 Hamilton International Airport Limited should give consideration to the development of the following projects in the medium term (5 to 10 year timeframe) as demand requires:

- Expansion of Runway 06-24 to 2,743m (9,000 ft.).
- Provision of Runway Emergency Stop Areas (RESA's) for all runways.
- Upgrading existing portions of Runway 06-24 to PLR 12.
- Provision of CAT II ILS on Runway 06.
- Upgrade of ILS on Runway 12 to CAT III.
- Construction of parallel taxiway to Runway 12-30.
- Construction of parallel taxiway to runway 06-24.
- Provision of new high speed exits on Runway 12-30.
- Provision of parallel taxiway access to terminal area from Runway 12-30.

8.2.1.3 Hamilton International Airport Limited should give consideration to the development of the following projects in the long term (10 to 20 year timeframe):

- Extension of Taxiway Whisky to accommodate future air cargo development
- Construction of high speed exits on Runway 12-30 and Runway 06-24
- Construction of remaining taxiway parallel to Runway 06-24;
- Construction of taxiways to serve future Dickenson Road commercial development.

## **8.2.2 Airport Support**

It is recommended that:

- 8.2.2.1 The City of Hamilton implement the AEGO Secondary Zoning Study to ensure sufficient lands adjacent to existing airport support functions to accommodate future expansion.
- 8.2.2.2 A new sand storage facility be constructed as part of the infrastructure improvement plan.
- 8.2.2.3 A detailed facility requirements program be developed for the Combined Airside Operations centre for provision of maintenance and emergency response services.

## **8.2.3 Airside Commercial**

It is recommended that:

- 8.2.3.1 Development on lands located within existing Airport boundaries be maximized to meet the short-term demand for airside commercial development.
- 8.2.3.2 The lands east of Apron III be developed for short-term commercial cargo development.
- 8.2.3.3 The development concept as set out in Figure 6.1B with respect to the medium and long-term development of Airport Commercial land uses be implemented.

## **8.2.4 Non-Airside Commercial**

It is recommended that:

- 8.2.4.1 The development concept as set out in Figure 6.1 with respect to the development of Non-Airside Commercial land uses be implemented.
- 8.2.4.2 The City of Hamilton proceed with final amendments to the Urban Official Plan and completion of Secondary Plans to support the rezoning of lands identified under the Airport Employment Growth District as 'Airport Related Business (ARB) and Airport Related Commercial (ARC).
- 8.2.4.3 The City of Hamilton proceed with the development of infrastructure required to support land uses identified under the Airport Employment Growth District.

## **8.3 UTILITIES / SERVICES**

It is recommended that:

- 8.3.1 The City of Hamilton provide the appropriate water and sanitary services to accommodate demands that will be imposed by future development as identified in the Airport Master Plan. This includes the provision of new and upgraded services.
- 8.3.2 The City of Hamilton Storm Water Management Plan for the Airport Employment Growth District have due regard for the future development identified under the Airport Master Plan.

## 9.0 10-Year Capital Projects

The following is a high level summary of major infrastructure project costs associated with the ongoing development of Hamilton International Airport. The project costs have been broken into 'sustaining' projects – those required to maintain existing infrastructure, and 'expansionary' projects – those required to accommodate projected growth and improve the functionality of the Airport.

### 9.1 SUSTAINING INFRASTRUCTURE PROJECTS

Major sustaining infrastructure project costs are identified in Table 9.1.

<b>Table 9.1 Sustaining Capital Project Costs</b>	
<b>Horizon</b>	<b>Cost</b>
Short Term (1-5 years)	\$6,475,650
Medium Term (5-10 years)	\$3,000,000
Long Term (10-20 Years)	\$2,000,000
<b>TOTAL</b>	<b>\$11,475,650</b>
Source: Hamilton International Airport	

### 9.2 EXPANSIONARY INFRASTRUCTURE PROJECTS

Major expansionary infrastructure project costs are identified in Table 9.2

<b>Table 9.2 Expansionary Infrastructure Project Costs</b>	
<b>Horizon</b>	<b>Cost</b>
Short Term (1-5 years)	\$3,050,000
Medium Term (5-10 years)	\$96,048,000
Long Term (10-20 Years)	\$24,350,000
<b>TOTAL</b>	<b>\$123,448,000</b>
Source: Hamilton International Airport	





## **APPENDIX A**

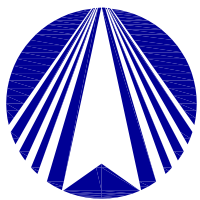
### **Large Scale Drawings**





BUILDINGS/FACILITIES INDEX

NO.	DESCRIPTION
01	AIR TERMINAL BUILDING
02	FORMER FEDEX BUILDING #1
03	FORMER FEDEX BUILDING #2
04	EMPLOYEE PARKING LOT
05	PRIMARY PARKING LOT
06	CWHM
07	ONTARIO FLIGHTCRAFT
08	PUROLATOR COURIER
09	TRANSPORT CANADA
10	JETPORT FBO
11	BELL COMMUNICATIONS BUILDING
12	AIC
13	HANGAR 2
14	CARGOJET HANGAR 3
15	GLANFORD AVIATION
16	HANGAR 5
17	FORMER GLANFORD MAINT. BLD.
18	ATB PUMP HOUSE
19	UPS
20	DHL
21	CARGOJET
22	ORNGE
23	WJ PUMPHOUSE
24	HAFFC FUEL FARM
25	UPS SWM POND
26	ABANDONED DF SITE
27	RAMP RADAR
28	RUNWAY 12 LOCALIZER
29	RUNWAY 30 LOCALIZER
30	RUNWAY 12 GLIDE PATH
31	RVR - A
32	TRANSMITTER SITE
33	FIELD ELECTRIC CENTRE (FEC)
34	RVR - B
35	COMBINED SERVICES BUILDING (CSB)
36	AWOS
37	ATCT
38	RECEIVER SITE
39	FIRE TRAINING AREA
40	CELL TOWER



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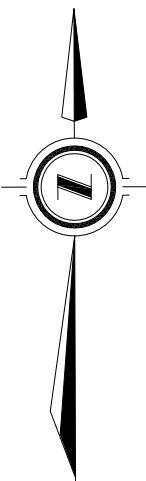
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Revisions

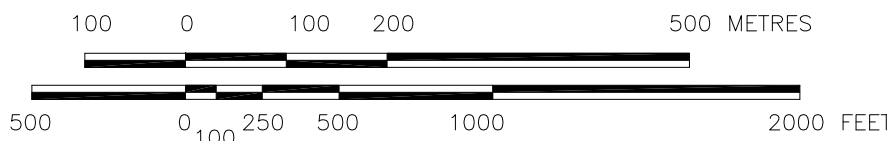
No.	Description	By	Appd.	Date
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1	FINAL REPORT	JJH	GB	APR-2011

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- BUILDINGS, ROADS AND TOPOGRAPHICAL FEATURE LOCATIONS ARE APPROXIMATE ONLY - BASED ON THIRD PARTY INFORMATION.



SCALE 1:7500  
ON 24"x36" (ARCH D)



GENERAL LEGEND

- EXISTING STRUCTURE / BUILDING
- EXISTING AIRSIDE PAVEMENT
- EXISTING AIRPORT BOUNDARY
- EXTENDED RUNWAY CENTRELINE
- EXISTING LEGAL BOUNDARY
- EXISTING ROAD

Client/Project

HAMILTON INTERNATIONAL AIRPORT  
20 YEAR MASTER PLAN UPDATE

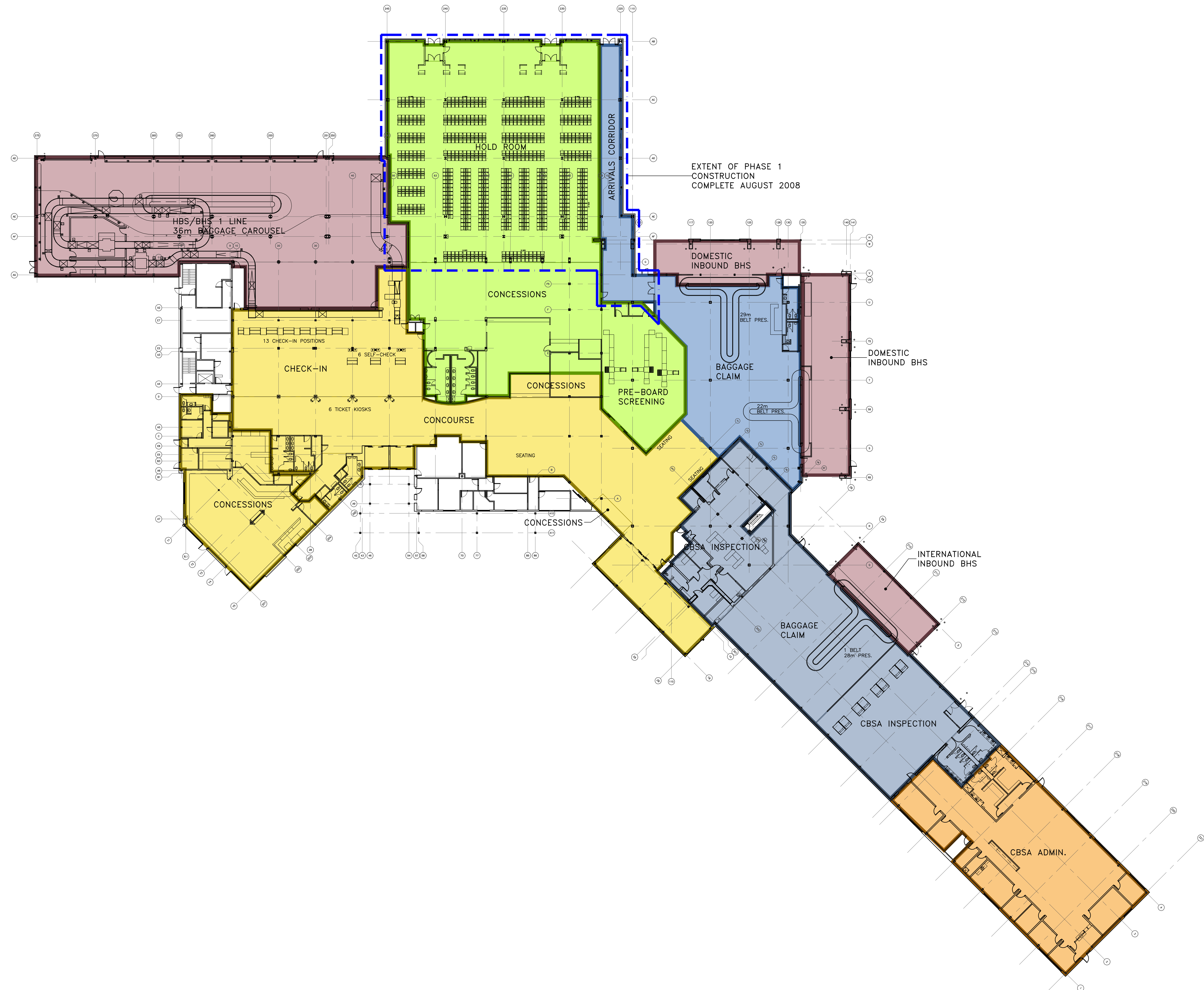
Hamilton, ON

Title

FIGURE 4.1  
HAMILTON INTERNATIONAL AIRPORT  
EXISTING CONDITIONS

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Revision: 1	Drawing No: FIG 4.1	06349





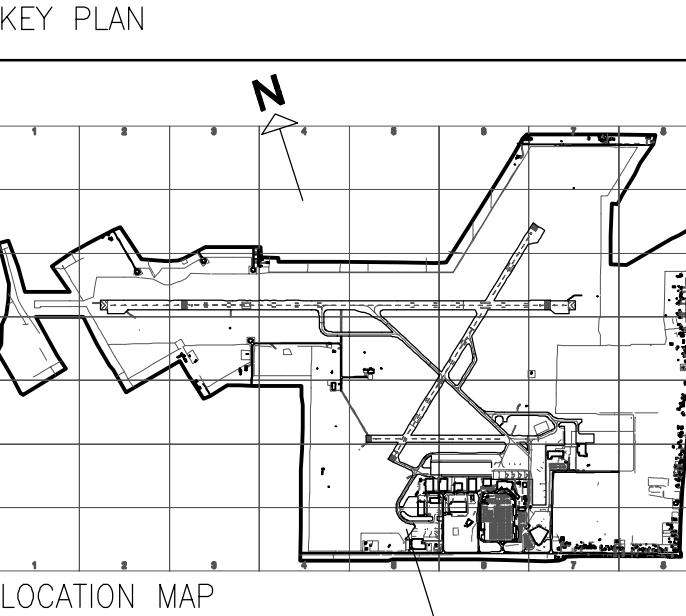
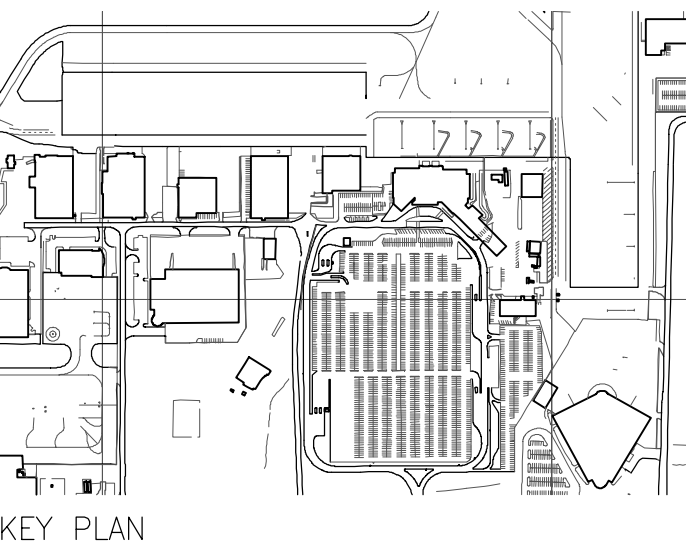
GENERAL NOTES

PROPOSED NET FLOOR AREA:

- PUBLIC CONCOURSE**  
TOTAL FLOOR AREA APPROX. 1829 sq.m
  - CHECK-IN  
FLOOR AREA APPROX. 414 sq.m
  - CONCESSIONS  
FLOOR AREA APPROX. 444 sq.m
  - CONCOURSE  
FLOOR AREA APPROX. 724 sq.m
- BAGGAGE HANDLING**  
TOTAL FLOOR AREA APPROX. 1556 sq.m
  - OUTBOUND  
FLOOR AREA APPROX. 1086 sq.m
  - INBOUND DOMESTIC  
FLOOR AREA APPROX. 359 sq.m
  - INBOUND INTERNATIONAL  
FLOOR AREA APPROX. 111 sq.m
- DEPARTURES**  
TOTAL FLOOR AREA APPROX. 1853 sq.m
  - HOLD ROOM  
FLOOR AREA APPROX. 1069 sq.m
  - CONCESSIONS  
FLOOR AREA APPROX. 474 sq.m
  - PRE-BOARD SCREENING  
FLOOR AREA APPROX. 234 sq.m
- DOMESTIC ARRIVALS**  
TOTAL FLOOR AREA APPROX. 660 sq.m
  - BAGGAGE CLAIM  
FLOOR AREA APPROX. 476 sq.m
- INTERNATIONAL ARRIVALS**  
TOTAL FLOOR AREA APPROX. 1051 sq.m
  - CBSA INSPECTION  
FLOOR AREA APPROX. 520 sq.m
  - BAGGAGE CLAIM  
FLOOR AREA APPROX. 381 sq.m
- CBSA ADMIN.**  
TOTAL FLOOR AREA APPROX. 609 sq.m



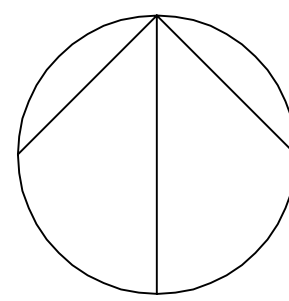
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JUL 7/08	AMENDMENT TO FINAL PDR	D
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PROJECT TITLE  
HAMILTON INTERNATIONAL AIRPORT  
TERMINAL DEVELOPMENT PLAN  
PDR

DRAWING TITLE  
EXISTING  
PHASE 1  
GROUND FLOOR PLAN

PROJECT NO.  
ECBL07-0137

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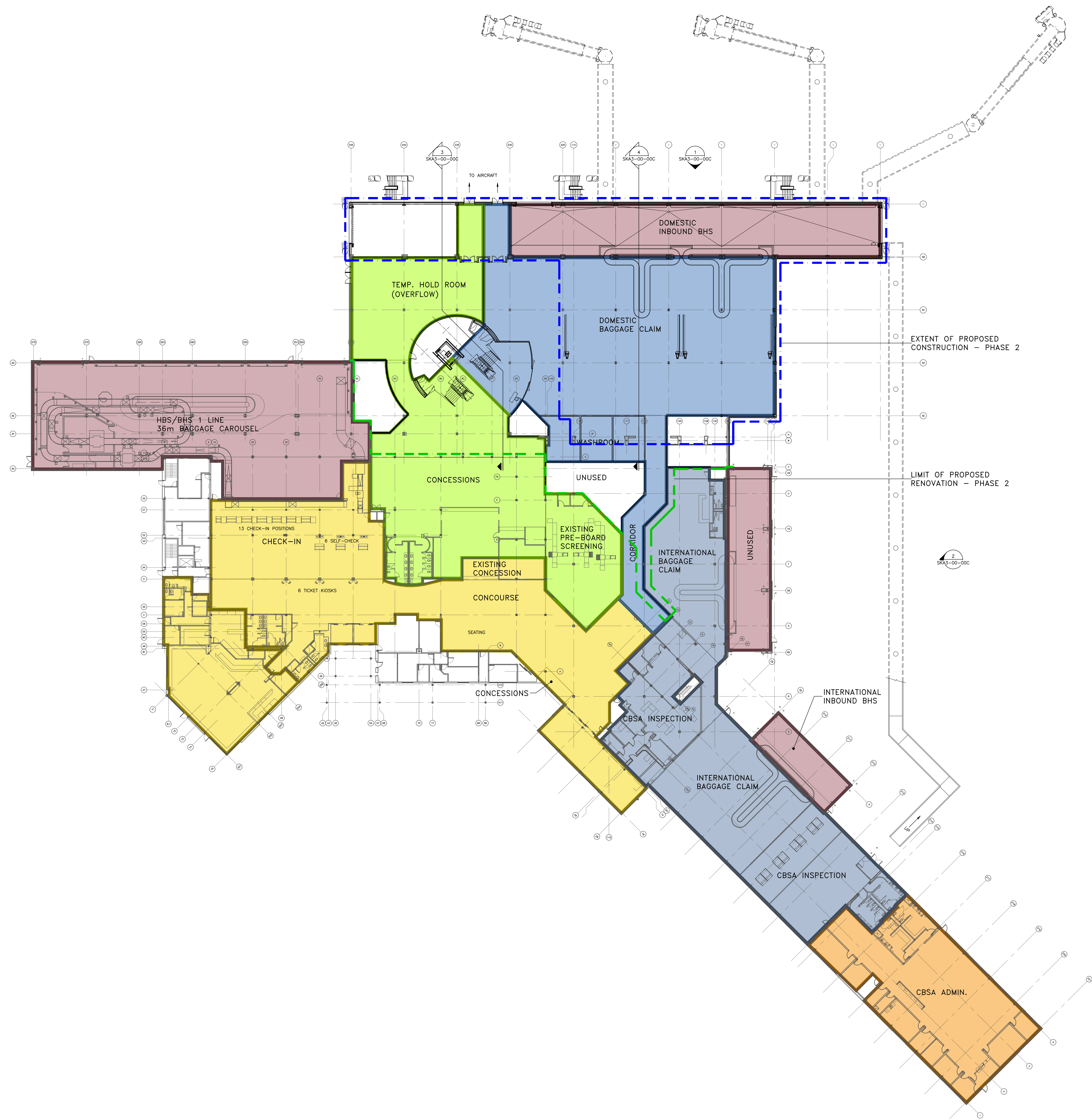
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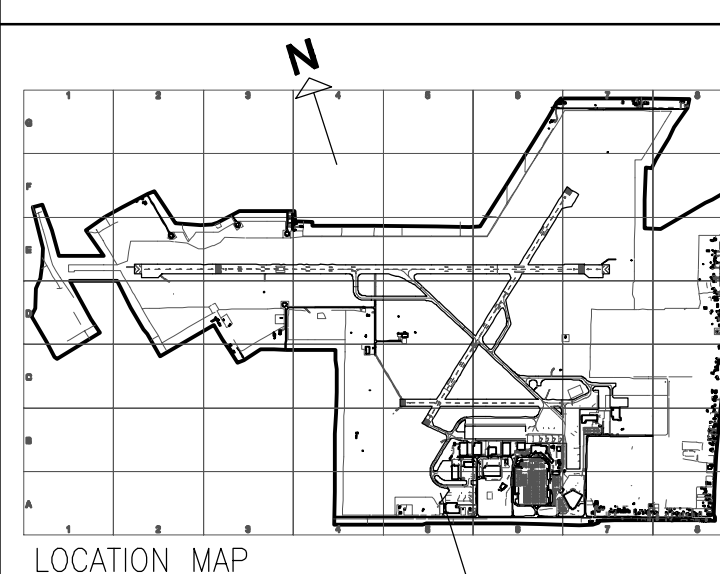
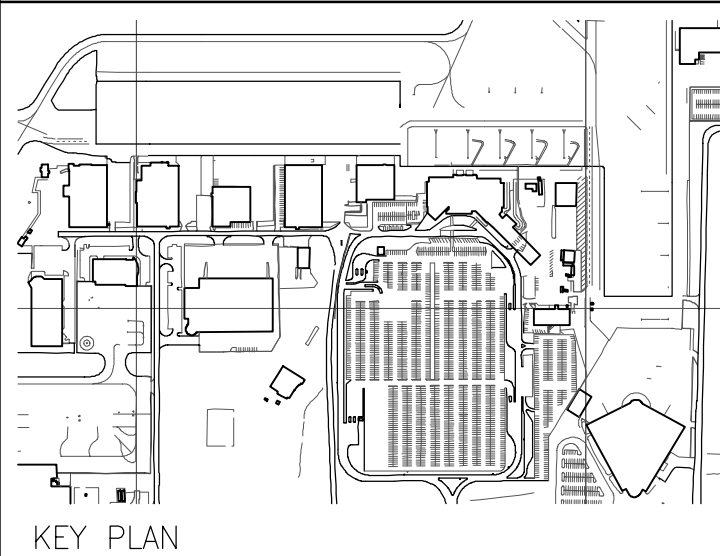


GENERAL NOTES

- PROPOSED NET FLOOR AREA:
- PUBLIC CONCOURSE**  
TOTAL FLOOR AREA APPROX. 1829 sq.m
    - CHECK-IN  
FLOOR AREA APPROX. 414 sq.m
    - CONCESSIONS  
FLOOR AREA APPROX. 444 sq.m
    - CONCOURSE  
FLOOR AREA APPROX. 751 sq.m
  - BAGGAGE HANDLING**  
TOTAL FLOOR AREA APPROX. 1975 sq.m
    - OUTBOUND  
FLOOR AREA APPROX. 1086 sq.m
    - INBOUND DOMESTIC  
FLOOR AREA APPROX. 556 sq.m
    - INBOUND INTERNATIONAL  
FLOOR AREA APPROX. 333 sq.m
  - DEPARTURES**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 1418 sq.m
    - PRE-BOARD SCREENING  
FLOOR AREA APPROX. 235 sq.m
    - CONCESSIONS  
FLOOR AREA APPROX. 474 sq.m
    - TEMP. HOLD ROOM (OVERFLOW)  
FLOOR AREA APPROX. 306 sq.m
  - DOMESTIC ARRIVALS**  
TOTAL FLOOR AREA APPROX. 1653 sq.m
    - BAGGAGE CLAIM  
FLOOR AREA APPROX. 1215 sq.m
  - INTERNATIONAL ARRIVALS**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 1405 sq.m
    - CBSA INSPECTION  
FLOOR AREA APPROX. 520 sq.m
    - BAGGAGE CLAIM  
FLOOR AREA APPROX. 723 sq.m
  - CBSA ADMIN.**  
TOTAL FLOOR AREA APPROX. 609 sq.m

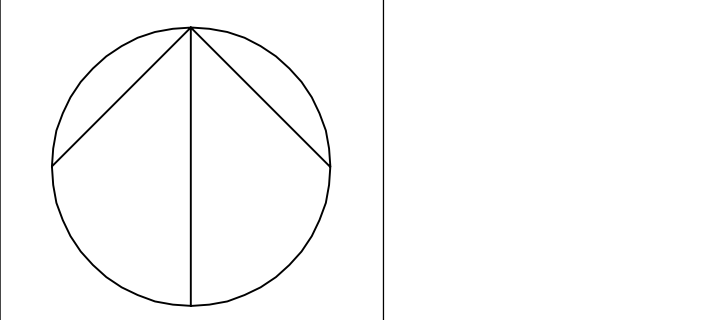


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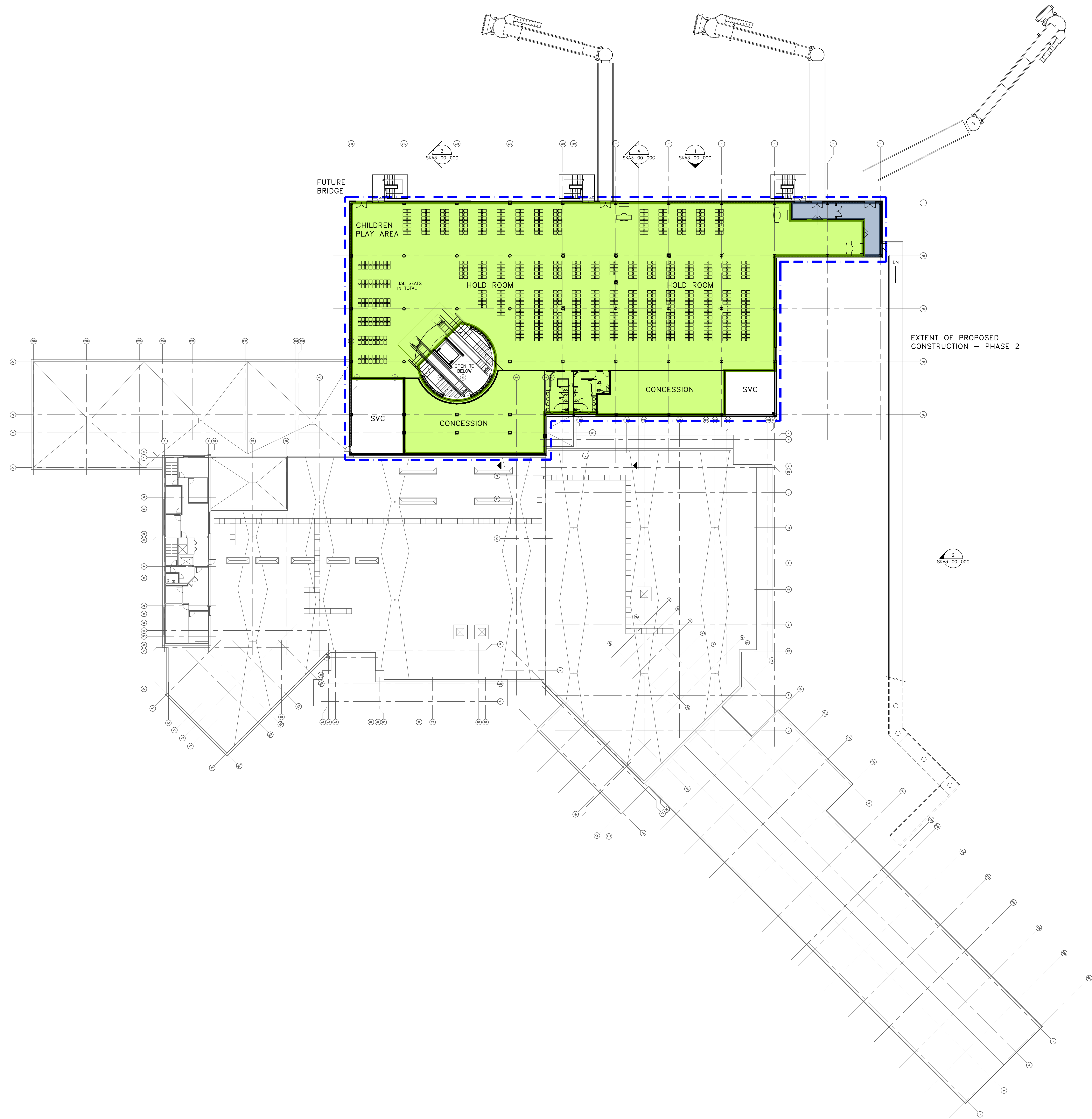


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PDR

DRAWING TITLE  
PROPOSED  
PHASE 2  
GROUND FLOOR PLAN OPTION 1C

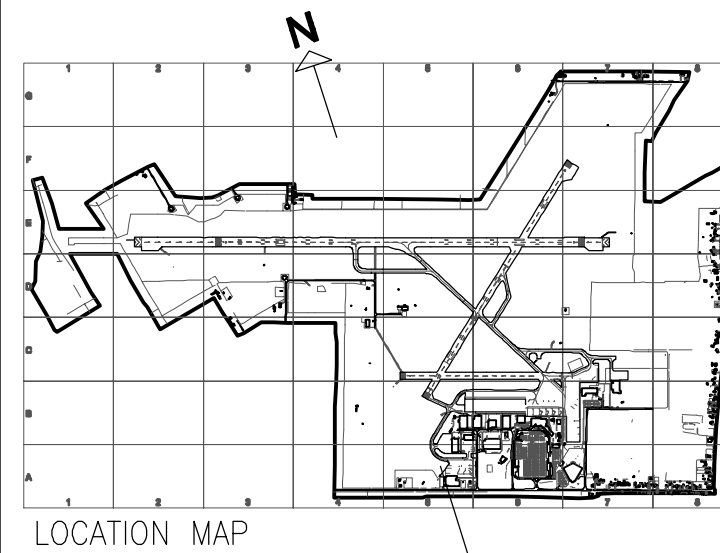
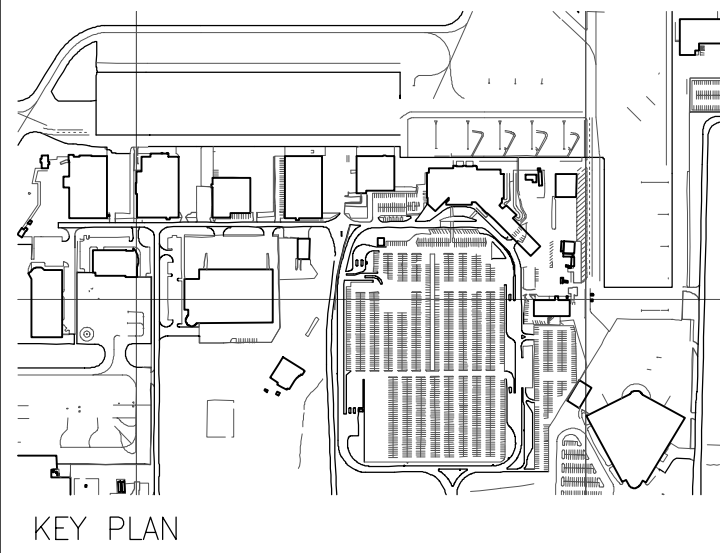
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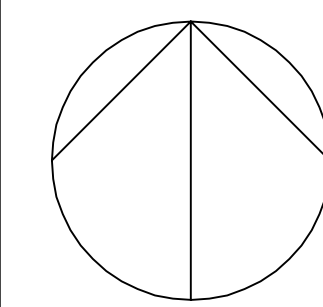
GENERAL NOTES

- PROPOSED NET FLOOR AREA:
1. **DEPARTURES**  
@SECOND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 2604 sq.m
    - CONCESSIONS  
FLOOR AREA APPROX. 438 sq.m
    - HOLD ROOM  
FLOOR AREA APPROX. 2045 sq.m
    - CHILDREN PLAY AREA  
FLOOR AREA APPROX. 82 sq.m
  2. **INTERNATIONAL ARRIVALS**  
@SECOND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 60 sq.m



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MOUNT HOPE, ON, L0R 1W0  
CANADA

CONSULTANT  
**NORR**  
Architects and Engineers  
110 King Street East  
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An Ingenium Group Company

PROJECT TITLE  
HAMILTON INTERNATIONAL AIRPORT  
TERMINAL DEVELOPMENT PLAN  
PDR

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PHASE 2  
SECOND FLOOR PLAN OPTION 1C

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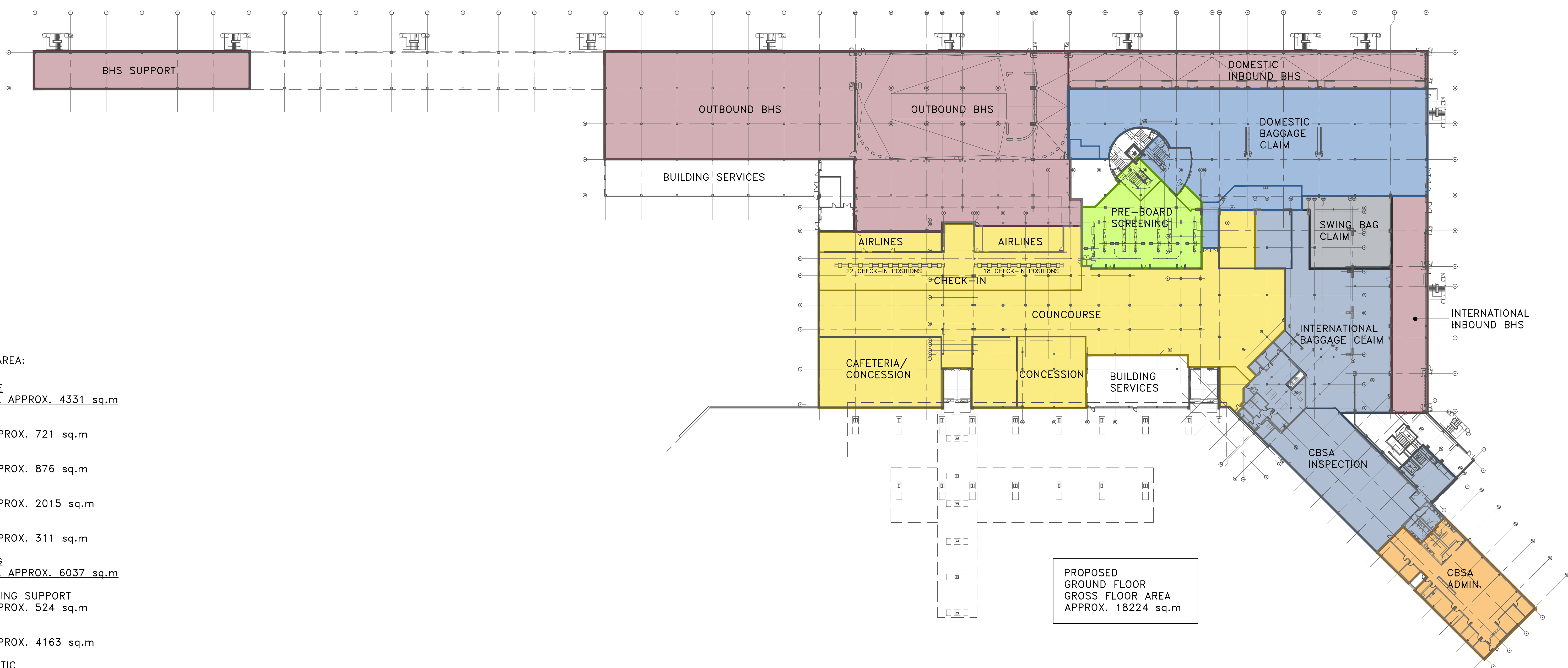
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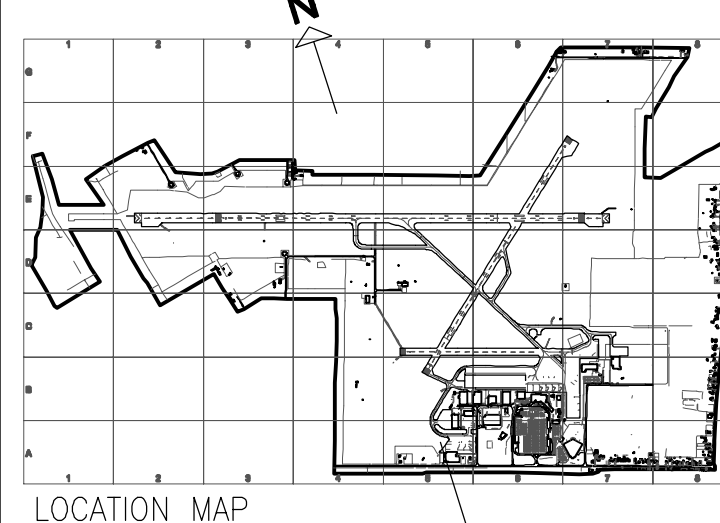
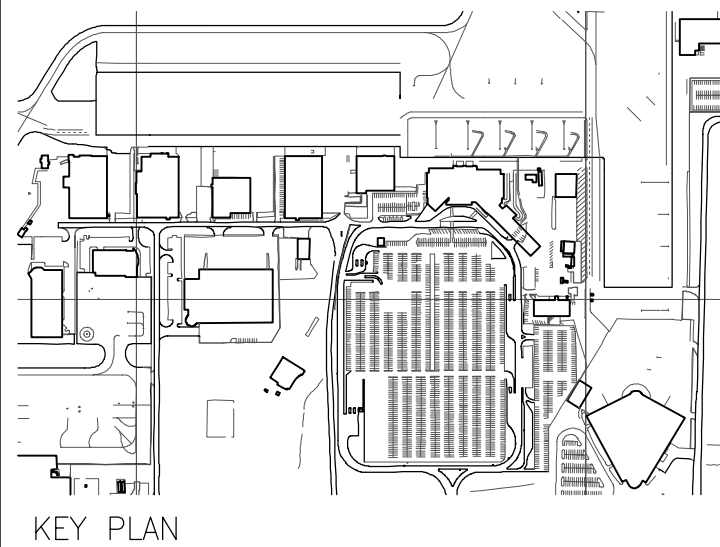
GENERAL NOTES

PROPOSED NET FLOOR AREA:

- PUBLIC CONCOURSE**  
TOTAL FLOOR AREA APPROX. 4,331 sq.m
  - CHECK-IN  
FLOOR AREA APPROX. 721 sq.m
  - CONCESSIONS  
FLOOR AREA APPROX. 876 sq.m
  - CONCOURSE  
FLOOR AREA APPROX. 2,015 sq.m
  - AIRLINES  
FLOOR AREA APPROX. 311 sq.m
- BAGGAGE HANDLING**  
TOTAL FLOOR AREA APPROX. 6,037 sq.m
  - BAGGAGE HANDLING SUPPORT  
FLOOR AREA APPROX. 524 sq.m
  - OUTBOUND  
FLOOR AREA APPROX. 4,163 sq.m
  - INBOUND DOMESTIC  
FLOOR AREA APPROX. 860 sq.m
  - INBOUND INTERNATIONAL  
FLOOR AREA APPROX. 490 sq.m
- DEPARTURES**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 639 sq.m
  - PRE-BOARD SCREENING  
FLOOR AREA APPROX. 553 sq.m
- DOMESTIC ARRIVALS**  
TOTAL FLOOR AREA APPROX. 2,301 sq.m
  - BAGGAGE CLAIM  
FLOOR AREA APPROX. 1,989 sq.m
- INTERNATIONAL ARRIVALS**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 2,249 sq.m
  - CBSA INSPECTION  
FLOOR AREA APPROX. 949 sq.m
  - BAGGAGE CLAIM  
FLOOR AREA APPROX. 985 sq.m
- SWING BAG CLAIM**  
TOTAL FLOOR AREA APPROX. 388 sq.m
- CBSA ADMIN.**  
TOTAL FLOOR AREA APPROX. 636 sq.m
- BUILDING SERVICES**  
@GROUND FLOOR LEVEL  
TOTAL FLOOR AREA APPROX. 1,016 sq.m

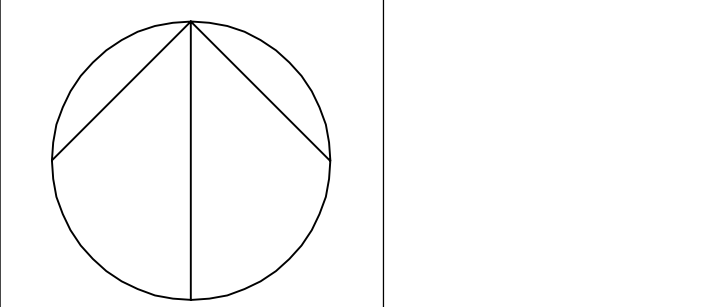


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CANADA

CONSULTANT  
**NORR**  
An Ingenium Group Company  
175 River Street East  
North York, ON M2H 1B7  
Canada, Canada  
416 593-0200  
416 593-0200

PROJECT TITLE  
HAMILTON INTERNATIONAL AIRPORT  
TERMINAL DEVELOPMENT PLAN  
PDR

DRAWING TITLE  
PROPOSED  
PHASE 3  
GROUND FLOOR PLAN

PROJECT NO.  
ECBL07-0137

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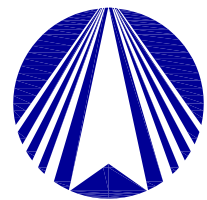
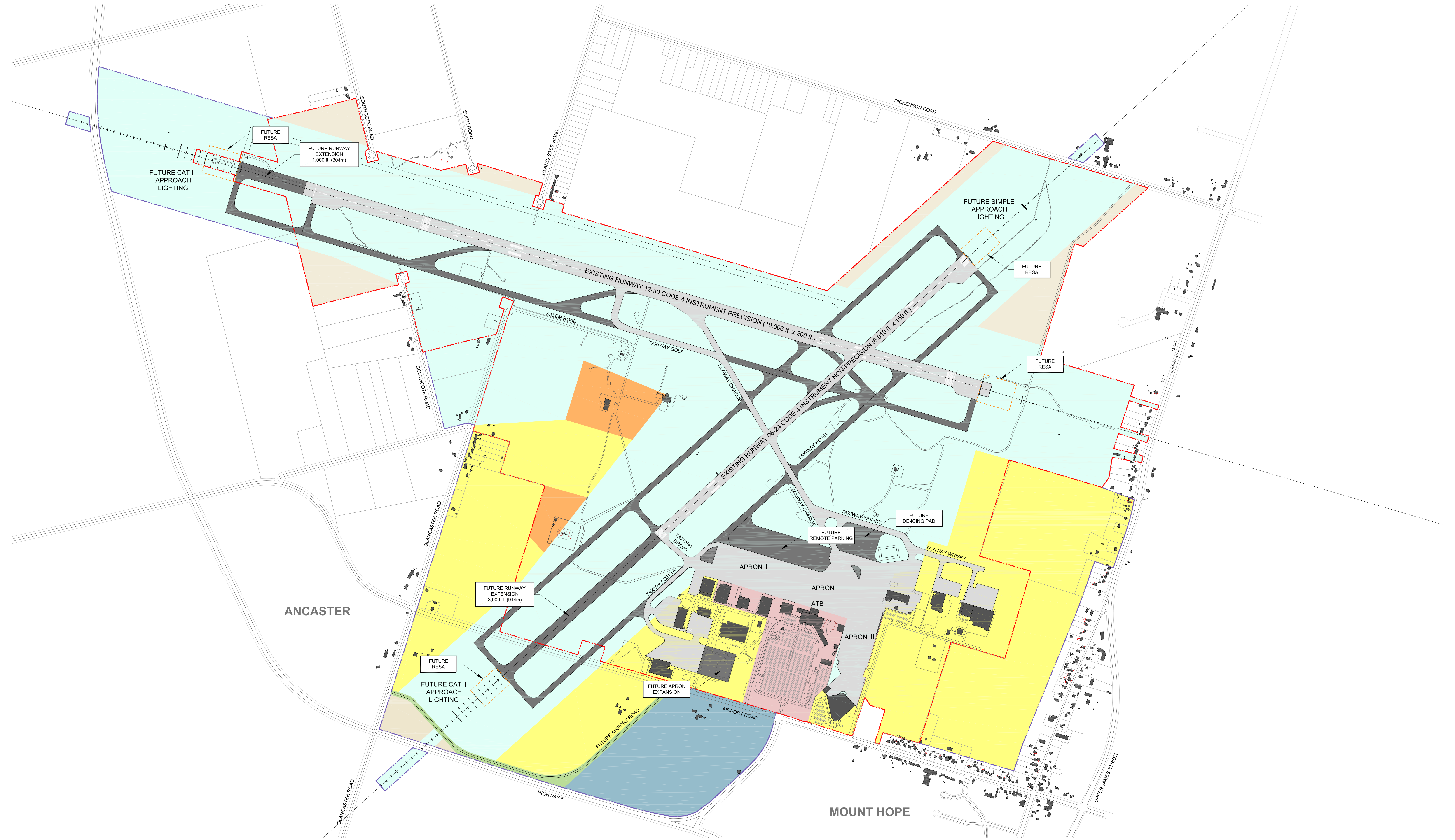
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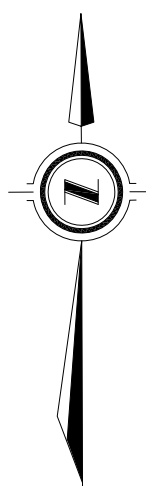
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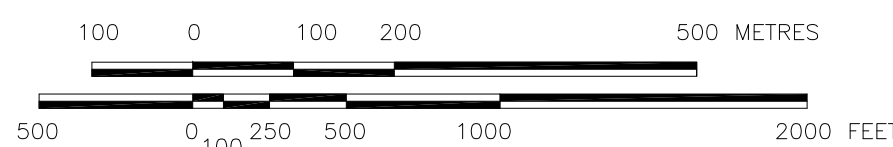
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SCALE 1:7500  
ON 24"x36" (ARCH D)



#### GENERAL LEGEND

	EXISTING AIRPORT BOUNDARY		FUTURE AIRPORT BOUNDARY
	EXTENDED RUNWAY CENTRELINE		EXISTING LEGAL BOUNDARY
	EXISTING ROAD		FUTURE ROAD
	FUTURE RUNWAY END SAFETY AREA		FUTURE AIRSIDE PAVEMENTS
	EXISTING STRUCTURE / BUILDING		AIRSIDE COMMERCIAL
	EXISTING AIRSIDE PAVEMENT		LANDSIDE COMMERCIAL
	FUTURE AIRSIDE PAVEMENTS		AIRPORT SUPPORT
	FUTURE STRUCTURE / BUILDING		TRANSPORTATION RESERVE
	AIRPORT RESERVE		TERMINAL RESERVE
	AIRSIDE RESERVE		

Client/Project

**HAMILTON INTERNATIONAL AIRPORT  
20 YEAR MASTER PLAN UPDATE**

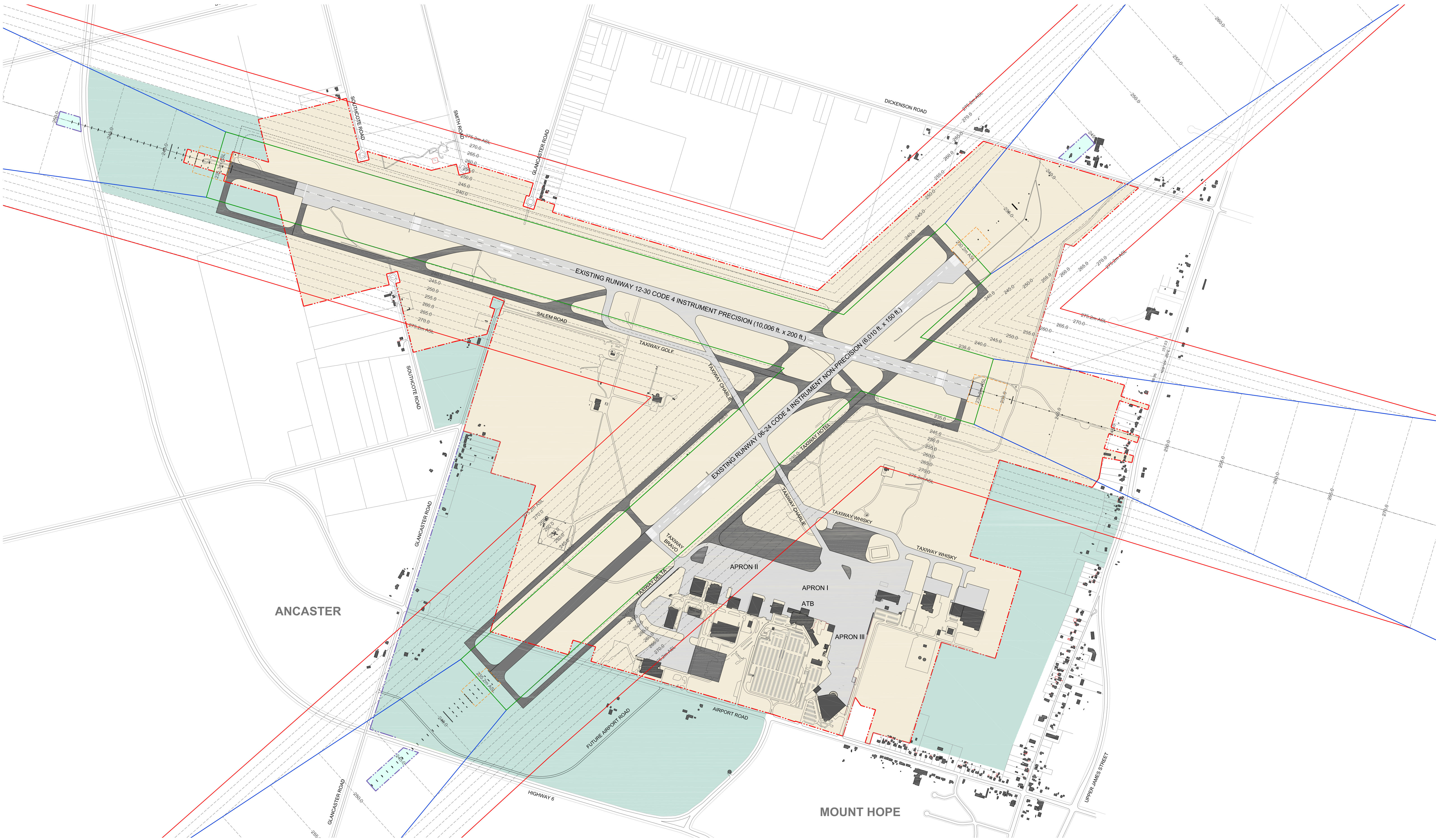
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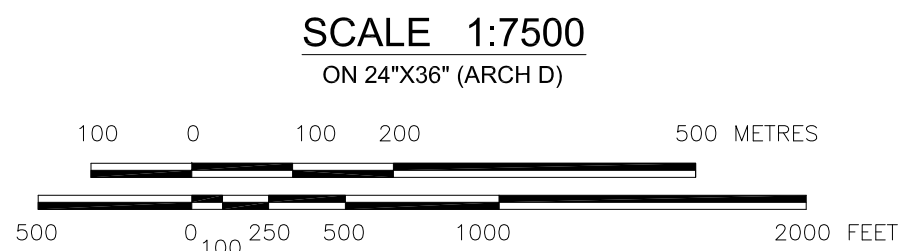
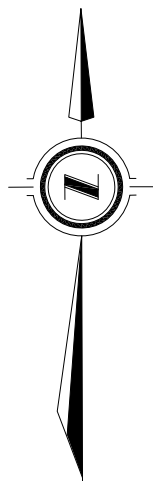
**FIGURE 6.1  
HAMILTON INTERNATIONAL AIRPORT  
FUTURE DEVELOPMENT PLAN**

Designed by: JJH	Scale: 1:7500 (24X36 SHEET)	
Own by: JJH	Reviewed by: GB	Project No.
Revision: 1	Drawing No: FIG 6.1	06349





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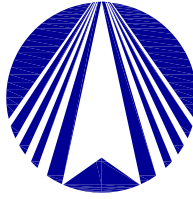
GENERAL LEGEND			
	EXISTING AIRPORT PROPERTY		EXTENDED RUNWAY CENTRELINE
	FUTURE LAND ACQUISITIONS		EXISTING LEGAL BOUNDARY
	EXISTING STRUCTURE / BUILDING		EXISTING ROAD
	EXISTING AIRSIDE PAVEMENT		FUTURE AIRSIDE PAVEMENTS
	FUTURE AIRSIDE PAVEMENTS		RUNWAY STRIP
			OLS - APPROACH SURFACE
			OLS - TRANSITIONAL SURFACE
			OLS - ELEVATION CONTOUR (m ASL)

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HAMILTON INTERNATIONAL AIRPORT 20 YEAR MASTER PLAN UPDATE		
Hamilton, ON		
Title		
FIGURE 6.4 HAMILTON INTERNATIONAL AIRPORT FUTURE OBSTACLE LIMITATION SURFACES		
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Own by: JJH	Reviewed by: GB	Project No.
Revision: 1	Drawing No: FIG 6.4	06349





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4. RUNWAY STRIP AND APPROACH SURFACES BASED ON TP312 4TH EDITION.
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SCALE 1:7500  
ON 24"x36" (ARCH D)

0 100 200 500 METRES  
500 0 100 250 500 1000 2000 FEET

**GENERAL LEGEND**

	EXISTING AIRPORT PROPERTY		EXTENDED RUNWAY CENTRELINE
	FUTURE LAND ACQUISITIONS		EXISTING LEGAL BOUNDARY
	EXISTING STRUCTURE / BUILDING		EXISTING ROAD
	EXISTING AIRSIDE PAVEMENT		FUTURE ROAD
	FUTURE AIRSIDE PAVEMENTS		FUTURE AIRSIDE PAVEMENTS
	FUTURE STRUCTURE / BUILDING		FUTURE RUNWAY END SAFETY AREA
			ELECTRONIC ZONING - LOCALIZER
			ELECTRONIC ZONING - GLIDE PATH
			ELECTRONIC ZONING - VHF/UHF COMM
			ELECTRONIC ZONING - RADAR

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**HAMILTON INTERNATIONAL AIRPORT  
20 YEAR MASTER PLAN UPDATE**

Hamilton, ON

Title

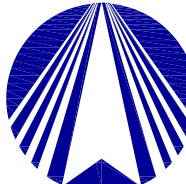
**FIGURE 6.5  
HAMILTON INTERNATIONAL AIRPORT  
FUTURE ELECTRONIC ZONING**

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Own by:	JJH	Reviewed by:	GB
Revision	1	Drawing No.	FIG 6.5
		Project No.	06349





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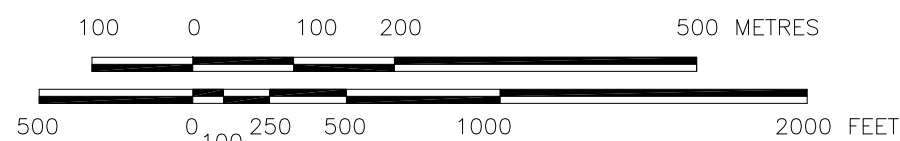
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Notes

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- DRAWING SHOWN IN UTM PROJECTION NAD27 ZONE 17.
- RUNWAY STRIP AND APPROACH SURFACES BASED ON TP312 4TH EDITION.
- BUILDINGS, ROADS AND TOPOGRAPHICAL FEATURE LOCATIONS ARE APPROXIMATE ONLY - BASED ON THIRD PARTY INFORMATION.

SCALE 1:7500  
ON 24"x36" (ARCH D)



**GENERAL LEGEND**

	EXISTING AIRPORT PROPERTY		FUTURE RUNWAY END SAFETY AREA
	FUTURE LAND ACQUISITIONS		FUTURE AIRSIDE PAVEMENTS SHORT-TERM (0-5 YEARS)
	EXISTING STRUCTURE / BUILDING		FUTURE AIRSIDE PAVEMENTS MEDIUM-TERM (5-10 YEARS)
	EXISTING AIRSIDE PAVEMENT		FUTURE AIRSIDE PAVEMENTS LONG-TERM (10-20 YEARS)
	FUTURE STRUCTURE / BUILDING		FUTURE AIRSIDE PAVEMENTS VERY LONG-TERM (20+ YEARS)
	EXTENDED RUNWAY CENTRELINE		
	EXISTING LEGAL BOUNDARY		
	EXISTING ROAD		
	FUTURE ROAD		

Client/Project

**HAMILTON INTERNATIONAL AIRPORT  
20 YEAR MASTER PLAN UPDATE**

Hamilton, ON

Title

**FIGURE 6.6  
HAMILTON INTERNATIONAL AIRPORT  
FUTURE DEVELOPMENT PHASING PLAN**

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Own by:	JJH	Reviewed by:	GB
Revision	1	Drawing No.	FIG 6.6
		Project No.	06349





## **APPENDIX B**

### **2006 Noise Impact and Evaluation Study**

# **Noise Impact and Evaluation Study**

## **John C. Munro Hamilton International Airport**

**Final Report**  
**City of Hamilton, Hamilton International Airport Limited**



**December 2006**

Prepared by

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## Summary

The noise exposure contours, forecasts, and projections have been computed in accordance with Transport Canada methodology. Surface area and population counts under each set of contours were also compiled.

The noise exposure contours will expand until 2015 but shrink considerably from 2015 to 2025. The expansion of the noise exposure contours is caused mainly by itinerant traffic increase and larger aircraft proportion increase. The shrinkage of the noise exposure contours, from 2015 to 2025, is caused mainly by the phase out of older and noisier aircrafts, the phase out will predominate over the other factors in the 2015 to 2025 period. The extension of Runway 06 will also contribute to the reduction of noise in the vicinity of the airport.

<i>NEF / NEP</i>	<i>Surface area*</i>		<i>Population*</i>	
	<i>km<sup>2</sup></i>	<i>vs. 2005</i>	<i>Number</i>	<i>vs. 2005</i>
2005	95.2	-	15 475	-
2010	117.5	+23%	14 193	-8%
2010 with extended Runway 06	110.0	+16%	12 489	-19%
2015 with extended Runway 06	127.5	+34%	17 601	+14%
2015 with extended Runway 06 and Runway 12 displaced threshold removed	131.2	+38%	17 243	+11%
2025 with extended Runway 06	64.0	-33%	11 210	-28%
2025 with extended Runway 06 and Runway 12 displaced threshold removed	65.3	-31%	9 849	-36%

\* Within NEF 25



## 1. INTRODUCTION

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Transport Canada has developed a methodology for the assessment of noise in the vicinity of airports, based on noise exposure contours. It is established across Canada and it has been used for the present study.

The present report contains the Noise Exposure Forecast (NEF) for 2010 and the Noise Exposure Projections (NEP) for 2010, 2015 and 2025 with extended Runway 06 and optional removal of displaced threshold for Runway 12. Noise contours for 2005 are also included, to serve as a basis for comparison.

Transport Canada's TP1247 "Land Use in the Vicinity of Airports" is used to determine compatible land use planning in the vicinity of airports.

## 2. METHODOLOGY

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### 2.1 *Metric and parameters*

The NEF/NEP rating, a single value rating, is easily interpretable, but it involves a complex calculation process. It integrates the various aircraft types, the runway use, the flight paths (positioning in space), the flight distances, the number of flights, and the time of operation of all aircraft movements into a model of the airport.

The study area covers a surface area of 1000 km<sup>2</sup>, a 24 km by 42 km rectangular area with a 610 meters grid. The study area used in the calculation is large enough to include the NEF 25 noise contour, the customary lower limit for noise contours.

### 2.2 *Inputs*

The 2005 itinerant aircraft movements' databases from NavCanada's NCAMs has been provided by the Airport Operator.

The 2005 local aircraft movements' databases have been purchased from NavCanada head office.

The traffic forecasts have been provided by the Airport Operator as follows:

**Table 1. Traffic forecasts**

<b>Year</b>	<b>Total (000s)</b>	<b>Local (000s)</b>	<b>Itinerant (000s)</b>
2005	74	30	44
2010	83	28	55
2015	87	25	62
2020	96	20	76
2025	108	20	88

The increases, relative to 2005, have been applied to the local and itinerant databases to obtain projected traffic.

The Airport Authority has provided the fleet mix forecast as follows:

**Table 2. Fleet mix forecasts**

<b>Class</b>	<b>2004</b>	<b>2020 and 2025</b>
Class A - small, single engine (12,500 lbs)	30%	5%
Class B - small, twin engine (12,500 lbs)	25%	10%
Class C – large, 12,500 lbs up to 300,000 lbs	35%	65%
Class D – large, 300,000 lbs and up	10%	20%

The 2005 fleet mix has been compiled from the local and itinerant movements' databases. The fleet mix for 2010 and 2015 has been interpolated between the compiled 2005 values and the 2025 forecast. The resulting fleet mix, including intermediate years is as follows:

**Table 3. Fleet mix forecasts interpolation**

<b>Class</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2025</b>
A	57%	44%	31%	5%
B	16%	15%	13%	10%
C	27%	37%	46%	65%
D	0.2%	5%	10%	20%

Runway 06 extension has been taken into account for 2010, 2015, and 2025. The Airport Operator suggested that the use of extended Runway 06 would increase 20 to 25% over existing; the median value of 22.5% has been used. For the cases with extended Runway 06 and removed Runway 12 displaced threshold, Runway 06 use was not increased.

The Airport Operator provided an extended set of flight tracks, from the Airport Noise and Flight Track Monitoring System; they were used to define the flight paths used in the NEF/NEP





foot landing distance, improving this approach. This can only be done when hydro towers are relocated or removed (likely not until 2015 or later).

The Airport Operator provided an extended set of flight tracks, from the Airport Noise and Flight Track Monitoring System; they were used to define the flight paths used in the NEF/NEP calculation in conjunction with published SIDs (Glanbrook One and Hamilton Seven) and information obtained from NavCanada tower personnel.

The City of Hamilton provided the base map data, in GIS and DXF formats, and the population data used for population counts. The provided population data is divided into traffic zones with surface areas ranging from 0.8 km<sup>2</sup> to 40.6 km<sup>2</sup>.

Boeing 727 phase out information was obtained from Kelowna Flightcraft and Cargojet Airways representatives: the Boeing 767 will replace the Boeing 727 between 2015 and 2025.

### **2.3 Calculation method**

The method for the calculation of Noise Exposure Forecasts and Noise Exposure Projections is detailed in the user manual of the NEF Micro Computer System User's Manual (TP6907E) prepared by Transport Canada.

The NEFCAL (version 1.8) computer program processes the input files containing the airport operations data. It computes the noise exposure levels for the calculation points on the grid. Constant noise level contours can then be interpolated and plotted as NEF/NEP contours.

The NEF methodology requires the use of the Peak Planning Day for the preparation of noise contours. The Peak Planning Day is defined to be the 95<sup>th</sup> percentile day. It means that, during the year, 5% of the movements occurred during days that were busier than the Peak Planning Day. The calculation details are presented in section 3.1.1.

The population counts are based on the surface area ratio of the noise exposure contours to the total surface area for each traffic zone. The ratios are applied to the population projections of the traffic zones to obtain the population within the noise exposure contours for all traffic zones.

Since some noise exposure contours extend beyond the area covered by the traffic zones, southwest of Sawmill Road, the population counts are slightly underestimated. The affected population counts are for all the NEF 25; NEF 28 of 2005, 2010, and 2015; NEF 30 of 2010 and 2015.



### 3.1.1 Peak Planning Day

Table 4 shows the results of the Peak Planning Day calculation for 2005 itinerant and local movements for John C. Munro Hamilton International Airport.

**Table 4. Peak Planning Day**

<i>Itinerant</i>				<i>Local</i>			
<i>Date</i>	<i>Mvts</i>	<i>%</i>	<i>cumulative</i>	<i>Date</i>	<i>Mvts</i>	<i>%</i>	<i>cumulative</i>
05-07-28	230	0.53%	0.5%	05-05-31	150	0.97%	1.0%
05-05-26	224	0.51%	1.0%	05-03-26	147	0.95%	1.9%
05-10-20	206	0.47%	1.5%	05-03-16	140	0.91%	2.8%
05-06-24	203	0.47%	2.0%	05-06-28	127	0.82%	3.7%
05-10-27	202	0.46%	2.4%	05-04-10	123	0.80%	4.5%
05-08-17	202	0.46%	2.9%	05-02-27	123	0.80%	5.3%
05-05-25	202	0.46%	3.4%				
05-06-01	202	0.46%	3.8%				
05-07-21	197	0.45%	4.3%				
05-10-21	194	0.45%	4.7%				
05-06-02	193	0.44%	5.2%				

Thus, according to Transport Canada methodology, the itinerant peak planning day has 193 movements; it has 62% more movements than the 2005 itinerant daily average of 119. The local peak planning day has 123 movements; it has 163% more movements than the 2005 local daily average of 47. Local movements show a much greater variability than itinerant movements, as expected.

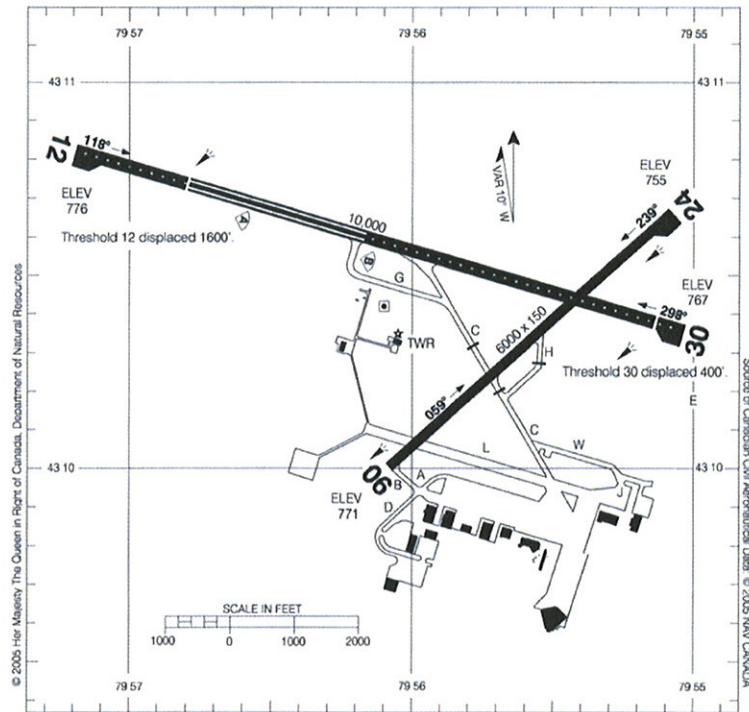
### 3.1.2 Fleet structure and runway use

Detailed fleet structure for year 2005 at John C. Munro Hamilton International Airport is presented in Appendix 1 for all known aircraft types. The Federal Aviation Administration (FAA) and Transport Canada aircraft registration databases and TP143, *Air Traffic Designators* have been used for the identification of aircraft types.

Helicopter movements have been included, in order to get as comprehensive results as possible, even if it is not absolutely required by the methodology. Helicopter movements make up 1.5% of all movements at John C. Munro Hamilton international Airport; their influence on noise contours is negligible.

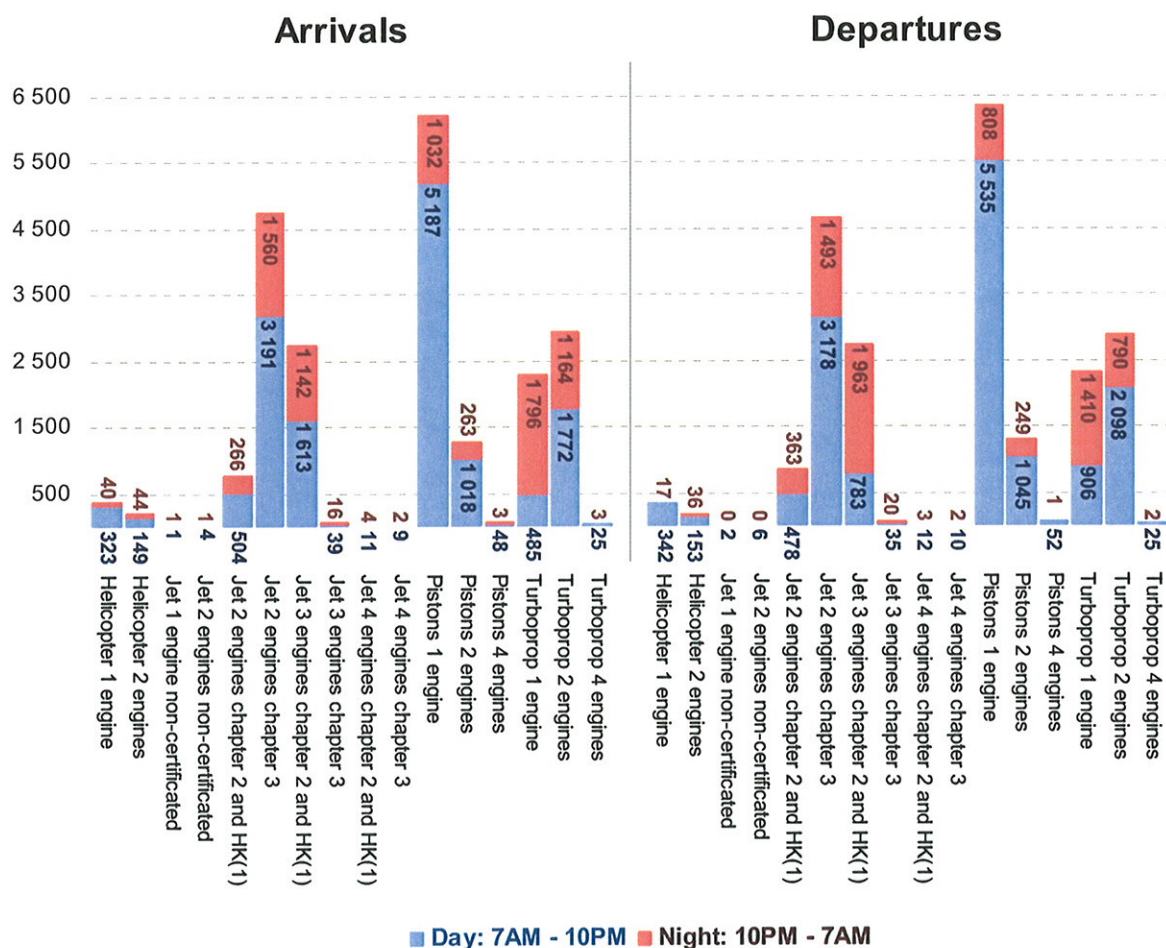
Figure 1 below show the runway identification, excerpt from the Canada Air Pilot.

**Figure 1. Runway identification**



Figures 2, 3, and 4 show the synthesis of fleet structure, acoustic classification, and runway use for itinerant movements at John C. Munro Hamilton International Airport in 2005. Detailed data is presented in Appendix 2.

**Figure 2. Synthesis of fleet structure**



<sup>(1)</sup> HK : hushkits

The total number of itinerant movements for 2005 is 43 533, of which 33% occurred during night-time (10PM to 7AM).

The Piper Cherokee, the Boeing 727, and the Cessna Caravan are the most frequently occurring aircrafts with a total of 36% of all itinerant movements for these three aircraft only.

Figure 3 below shows that the proportion of native chapter 2 aircraft (with and without hushkits), among all itinerant jets, is 43%. The Boeing 727 accounts for 76% of native chapter 2 aircraft movements.



**Figure 3. Acoustic classification of jet aircrafts<sup>1</sup>**

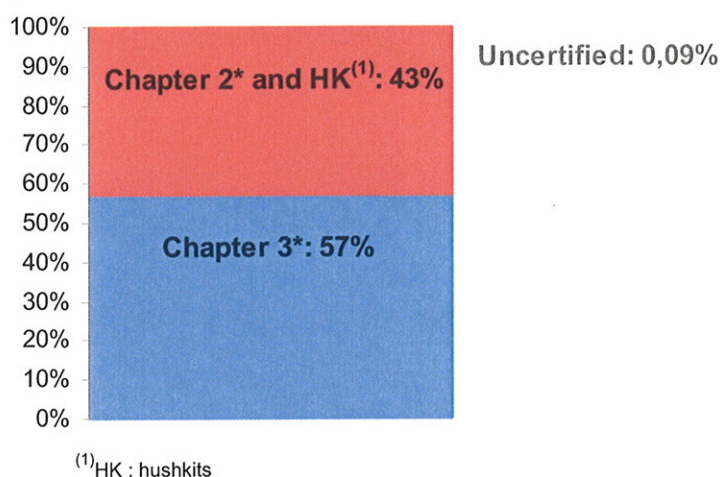
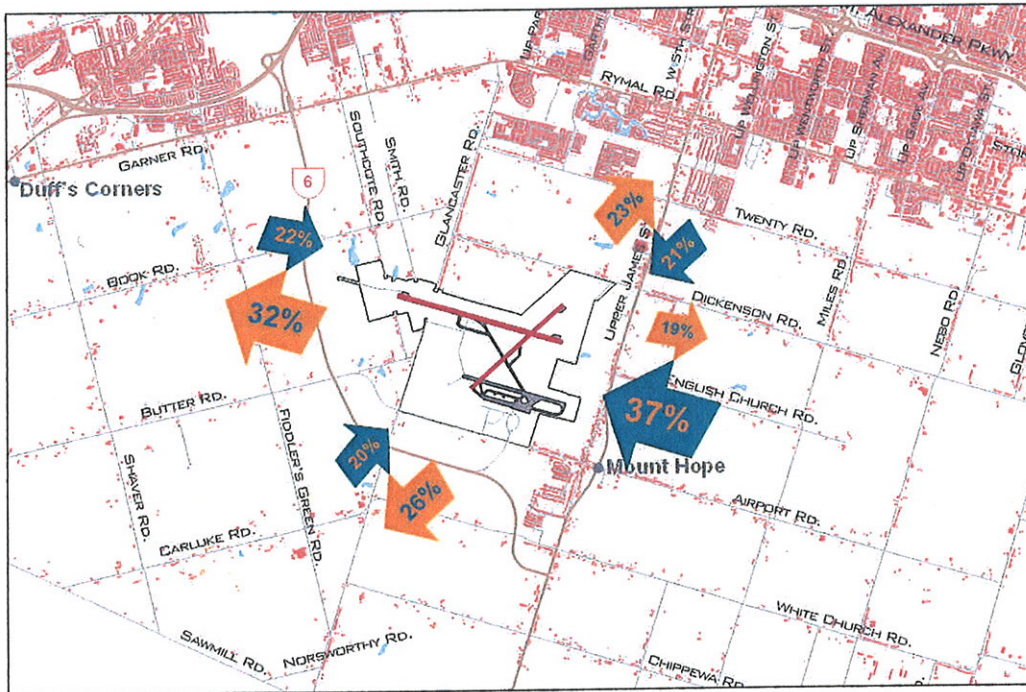


Figure 4 shows the synthesis of runway use during 2005. Table 5 presents the runway use by aircraft category (jet, piston, turbo).

<sup>1</sup> All civil aviation aircrafts must comply to applicable noise criteria. Most ICAO countries have committed to comply with the noise criteria described in chapters 2 and 3 of appendix 16 of the Convention on Civil Aviation, adopted in 1971. This is the origin of the term *chapter*. The U.S.A. have adopted similar criteria, described in the FAA Federal Air Regulations (FAR) Part 36. The word *stage* is used in the U.S.A. instead of *chapter*. Since the two sets of criteria are almost identical, both designations are equivalent. Following the adoption of these criteria, non-certified aircraft (DC-8, B707, Trident, Caravelle, etc.) have been withdrawn, design of new models not chapter 3 compliant was stopped, and production of existing models not chapter 3 compliant was stopped. ICAO and FAA now prohibit the operation of aircraft not complying with chapter 3 criteria. In the U.S.A., FAR Part 161 prohibits the operation of chapter 2 aircrafts since January 1<sup>st</sup>, 2000. In Canada, RAC 602.105 prohibits the operation of chapter 2 aircrafts since April 2002.

**Figure 4. Synthesis of runway use**



**Table 5. Runway use by type of engines**

Runway	Global		Jets		Pistons		Turbos	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
06	20%	23%	7%	13%	36%	39%	22%	20%
12	22%	19%	36%	28%	5%	4%	19%	22%
24	21%	26%	12%	12%	34%	36%	19%	36%
30	37%	32%	44%	47%	25%	22%	40%	22%
Total	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

Runway 30 comes first both for arrivals, with 37% of all arrivals, and for departures, with 32% of all departures. Almost half of all jet movements occur on Runway 30.

A description of the aircraft classes used in the calculations is given in Table 6 below. Aircraft with very few movements are not listed in Table 3 but are found in Appendix 1.

**Table 6. Aircraft classes**

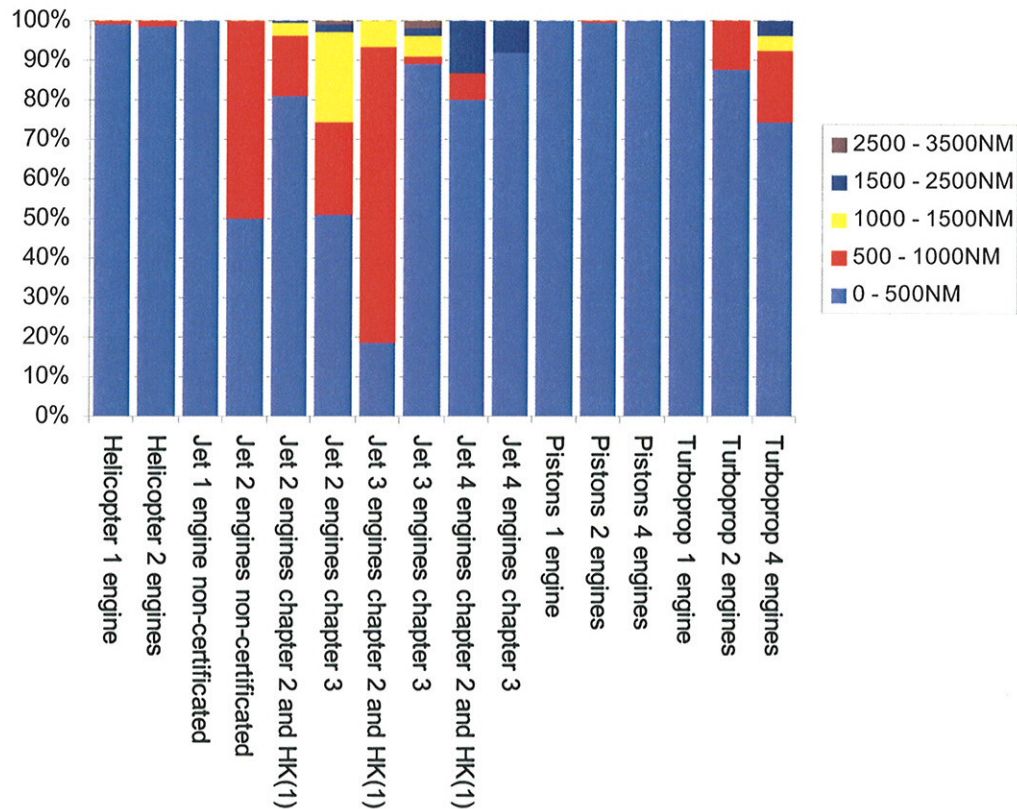
<b>Class</b>	<b>Aircraft type</b>
Helicopter 1 engine	Bell 206, Aerospatiale AS350/550, Robinson R44, Hughes 369/500, etc.
Helicopter 2 engines	Sikorsky S-76, Bell 212, Aerospatiale AS355/555, Bell 412, etc.
Jet 1 engine non-certificated	McDonnell Douglas F16 (only 2 movements in 2005).
Jet 2 engines non-certificated	McDonnell Douglas F18 (only 5 movements in 2005).
Jet 2 engines chapter 2 et HK <sup>(1)</sup>	Boeing 737-200, McDonnell Douglas DC-9, Learjet 24/25.
Jet 2 engines chapter 3	Boeing 737-300/500/700/800, Canadair Regional Jet, Cessna 550, Boeing 757, IAI 1125, Falcon 20, BAe 125, HS 125, Canadair Challenger, etc.
Jet 3 engines chapter 2 et HK <sup>(1)</sup>	Boeing 727.
Jet 3 engines chapter 3	Falcon 50 and 900.
Jet 4 engines chapter 2 et HK <sup>(1)</sup>	McDonnell Douglas DC-8-60, etc.
Jet 4 engines chapter 3	McDonnell Douglas DC-8-70.
Pistons 1 engine	Piper PA-24/28/32/38, Cessna 152/172/182/206, etc.
Pistons 2 engines	Piper PA-23/30/31/34/44, Beech 18/58, etc.
Turboprop 1 engine	Cessna Caravan, Pilatus PC-12, etc.
Turboprop 2 engines	Beech 90/99/1900, Piper Cheyenne, Jetstream 31, etc.
Turboprop 4 engines	Lockheed Hercules, etc.

<sup>(1)</sup>HK : hushkits.



Figure 5 shows the range distribution for itinerant departures for each aircraft class.

**Figure 5. Range distribution (nautical miles).**



Movements with unknown range have been given the average value of for its aircraft type.

Most departures have destinations within 500 nautical miles (926 km), this category includes Ottawa, Montreal, etc. Many jet departures have destinations in the 500 to 1000 nautical miles (926 – 1 852 km) range, this category includes Winnipeg, Moncton, Halifax, Thunder Bay, etc. The main destinations in the 1 000 to 1 500 nautical miles (1 852 – 2 778 km) range are Calgary and Edmonton.

### 3.1.3 Flight Paths

Three main sources of information were used to compile the flight paths for use in the calculations: published SIDs (Glanbrook One and Hamilton Seven), actual flight paths obtained from the airport noise and flight track monitoring system and provided by the Airport Operator, and information obtained from NavCanada personnel.

## 3.2 Results

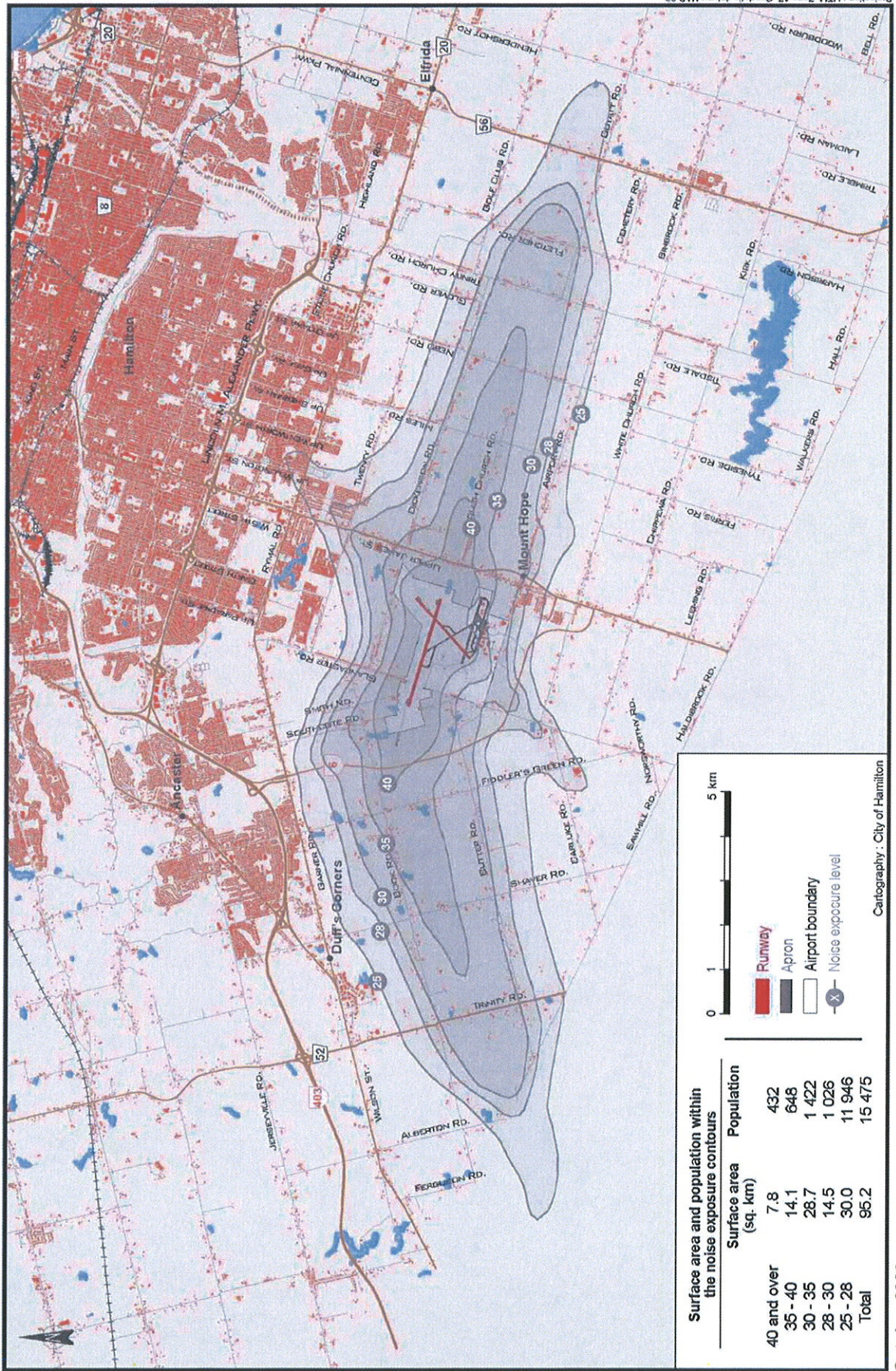
The NEF/NEP contours are shown on figures 6 through 12:

- figure 6: noise exposure contours, 2005 historical data;
- figure 7 : noise exposure forecast (NEF), 2010;
- figure 8: NEF, 2010, with Runway 06 extended to 9 000';
- figure 9: noise exposure projection (NEP), 2015, with extended Runway 06;
- figure 10: NEP, 2015, with extended Runway 06 and displaced threshold of Runway 12-30 removed (10 000');
- figure 11: NEP, 2025, with extended Runway 06, Boeing 727 replaced by Boeing 767, and Boeing 737-200 replaced by Boeing 737-500/600/700/800;
- figure 12: NEP, 2025, with extended Runway 06 and displaced threshold removed, Boeing 727 replaced by Boeing 767, and Boeing 737-200 replaced by Boeing 737-500/600/700/800;



# 2005 Noise Exposure Contours John C. Munro Hamilton International Airport

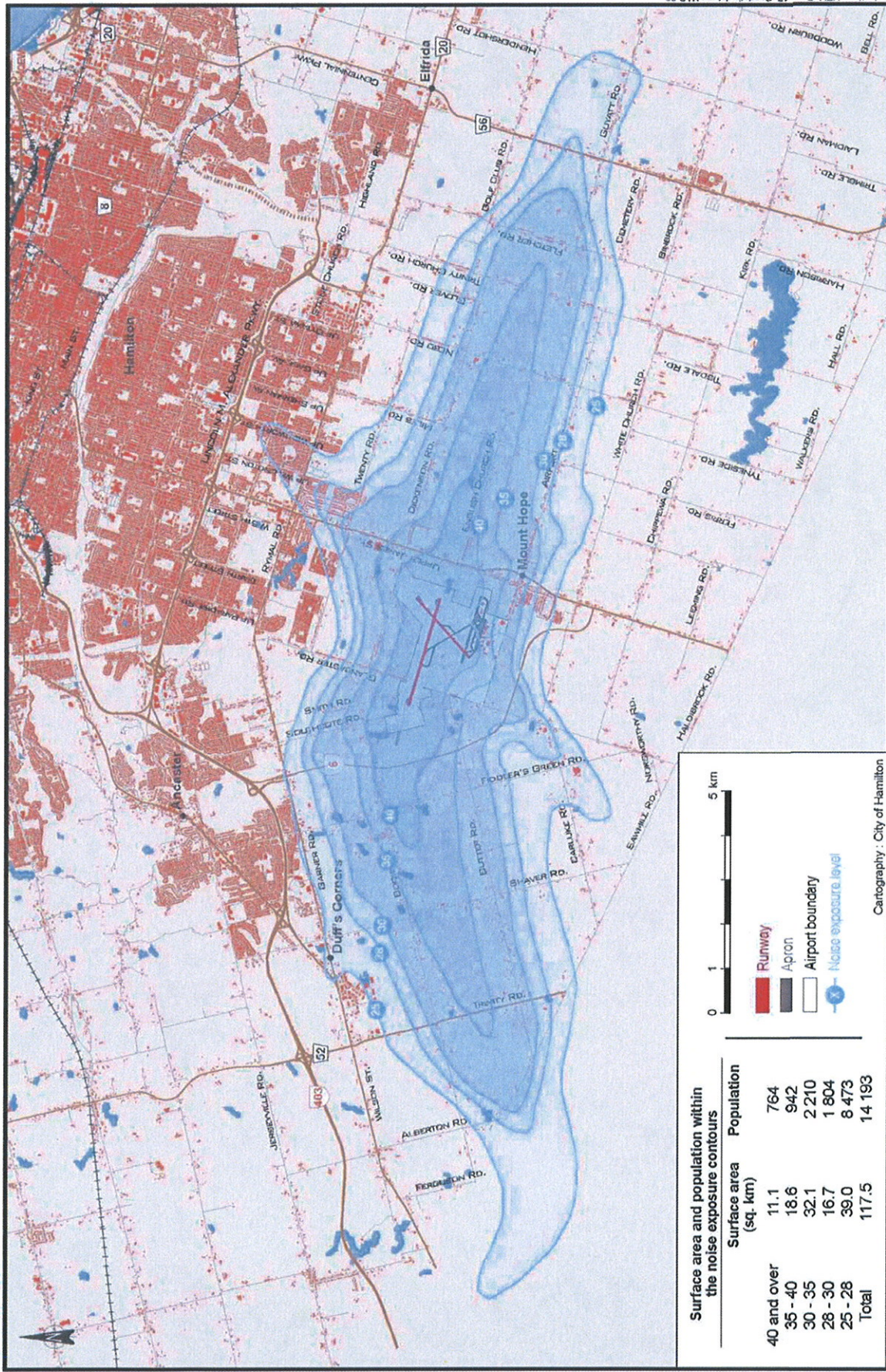
Figure 6.





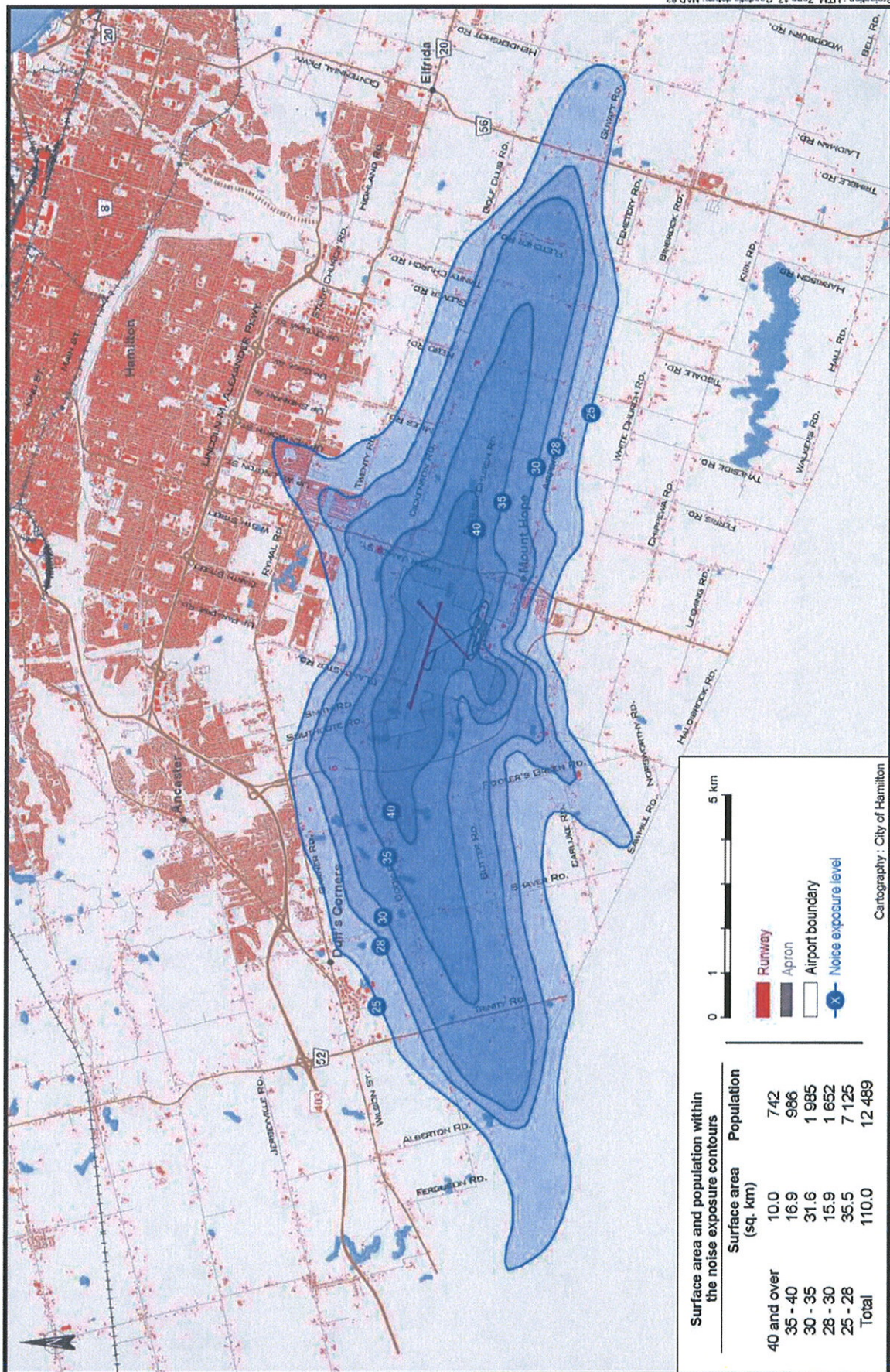
# 2010 Noise Exposure Forecast John C. Munro Hamilton International Airport

Figure 7.



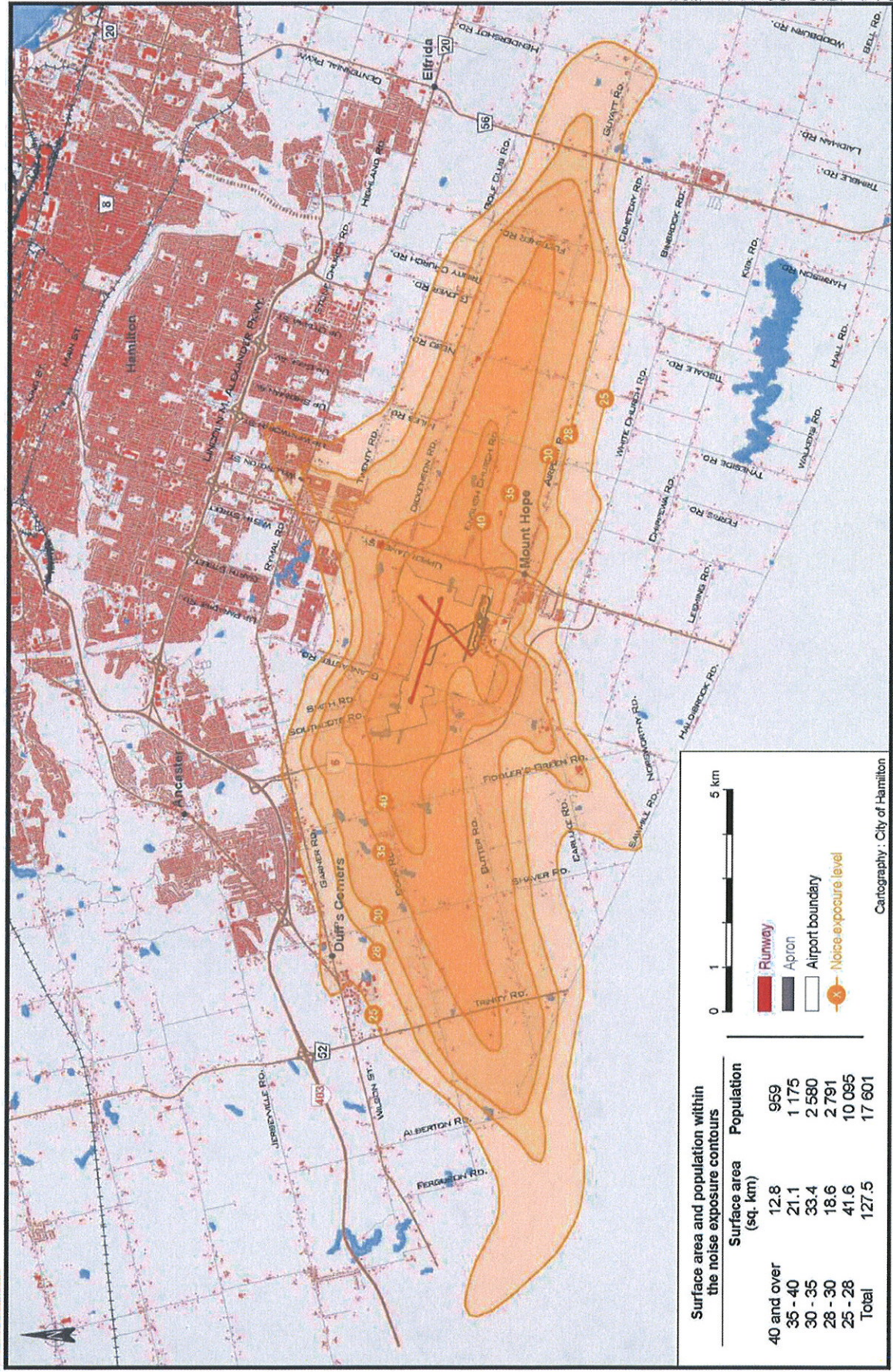


**Figure 8.**  
**2010 Noise Exposure Forecast**  
**Extended Runway 06**  
**John C. Munro Hamilton International Airport**



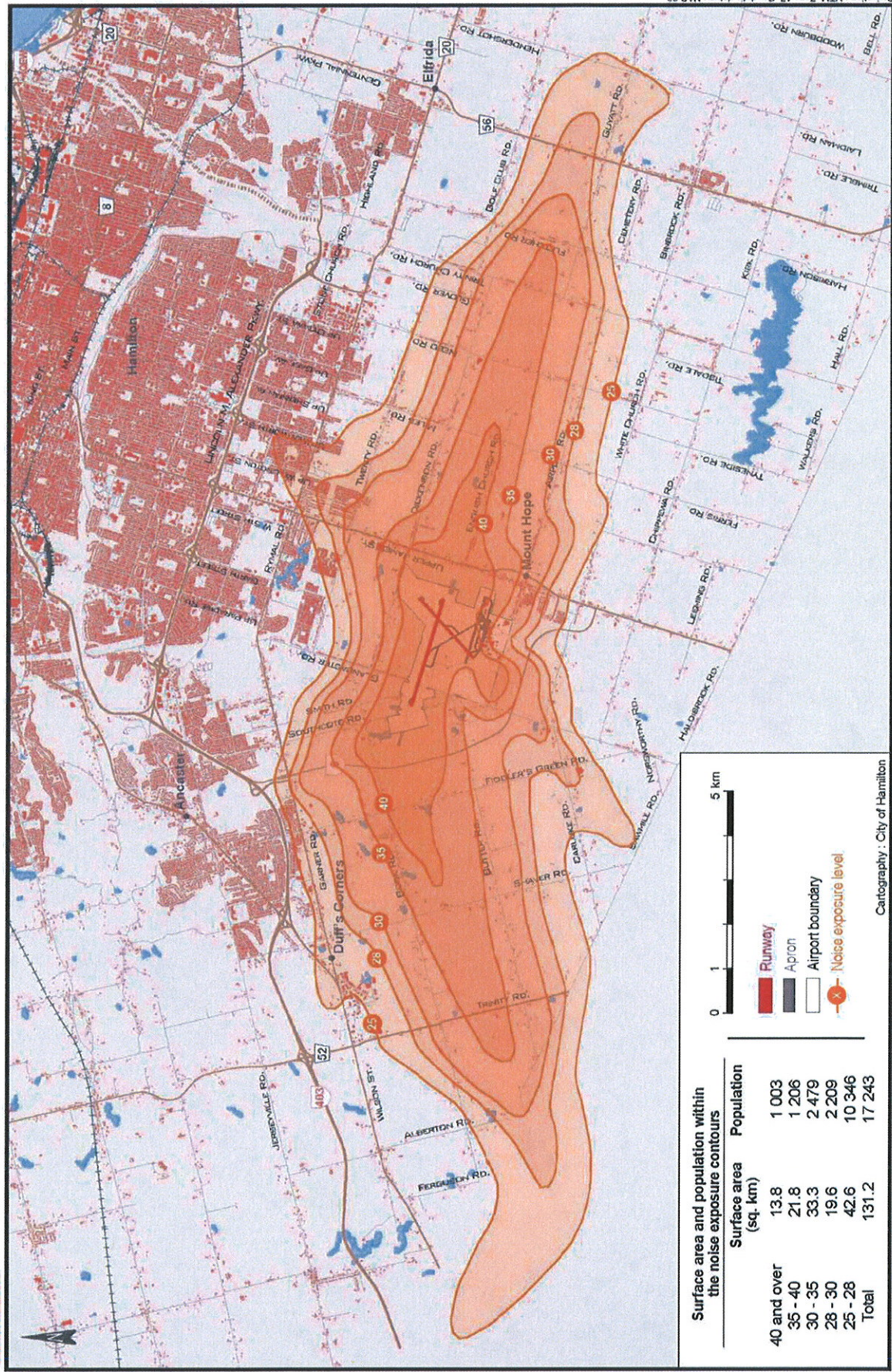


**Figure 9.**  
**2015 Noise Exposure Projection**  
**Extended Runway 06**  
**John C. Munro Hamilton International Airport**



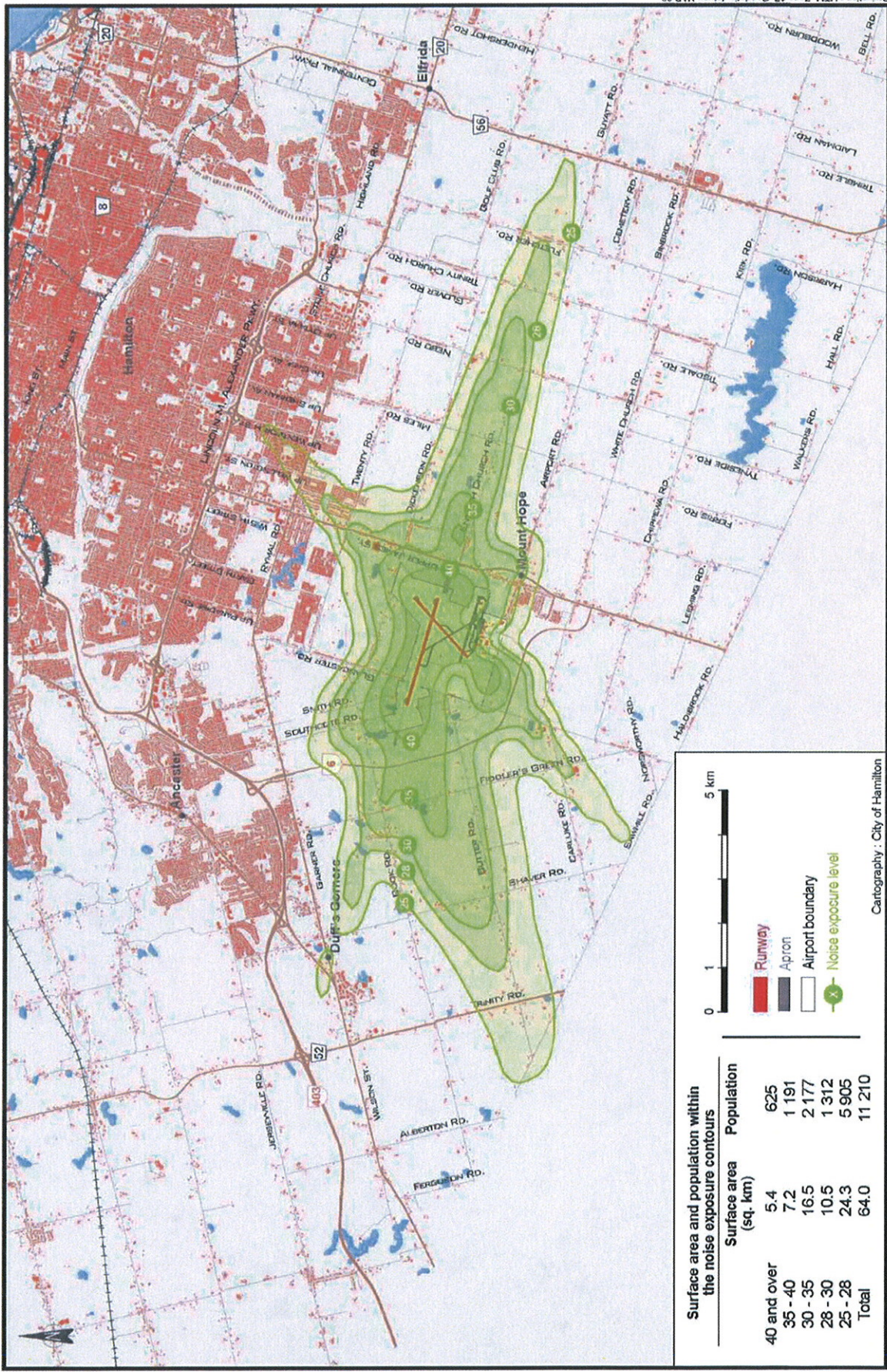


**Figure 10.**  
**2015 Noise Exposure Projection**  
**Extended Runway 06, Runway 12 displaced threshold removed**  
**John C. Munro Hamilton International Airport**



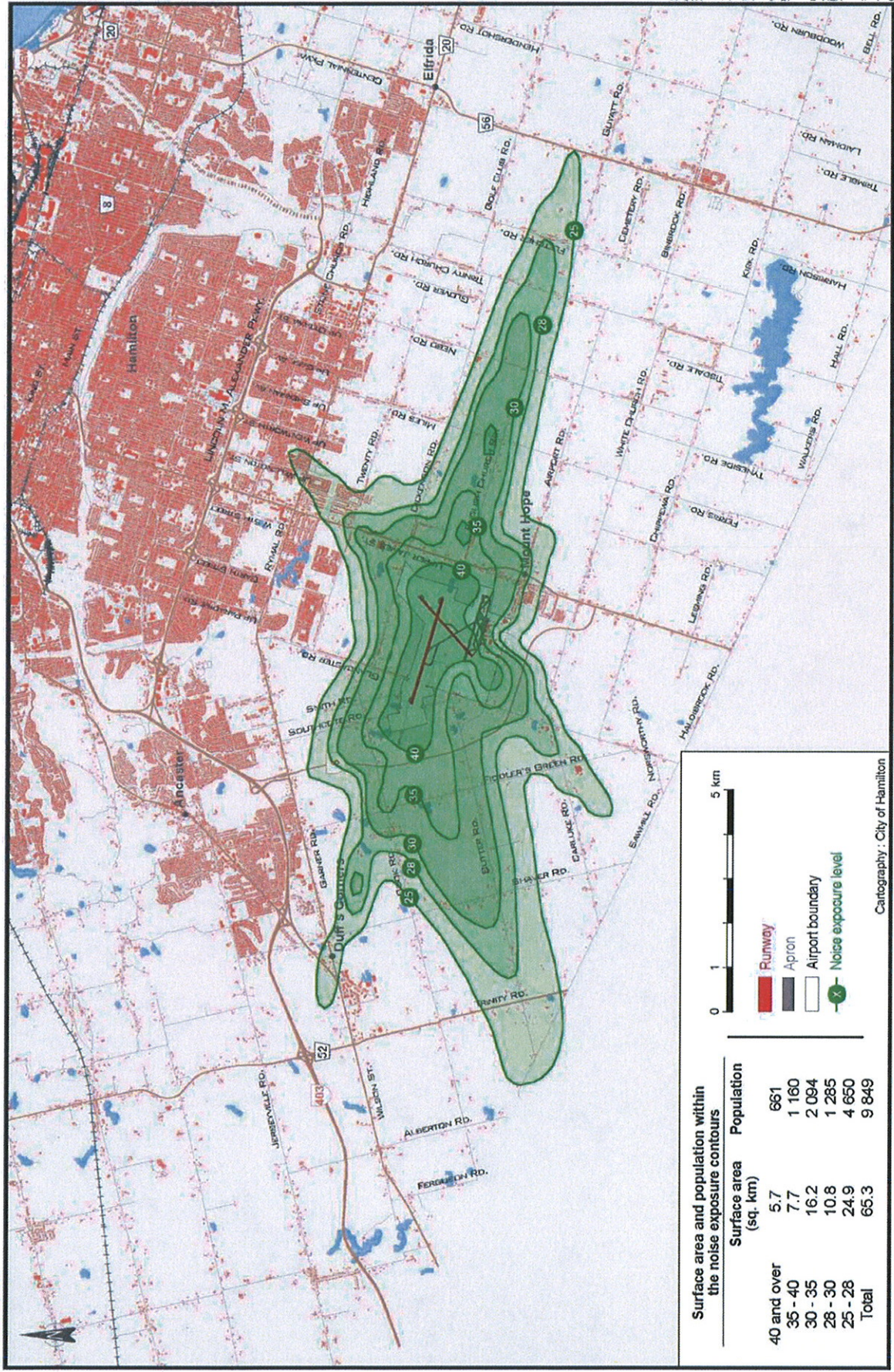


**Figure 11.**  
**2025 Noise Exposure Projection**  
**Extended Runway 06**  
**John C. Munro Hamilton International Airport**





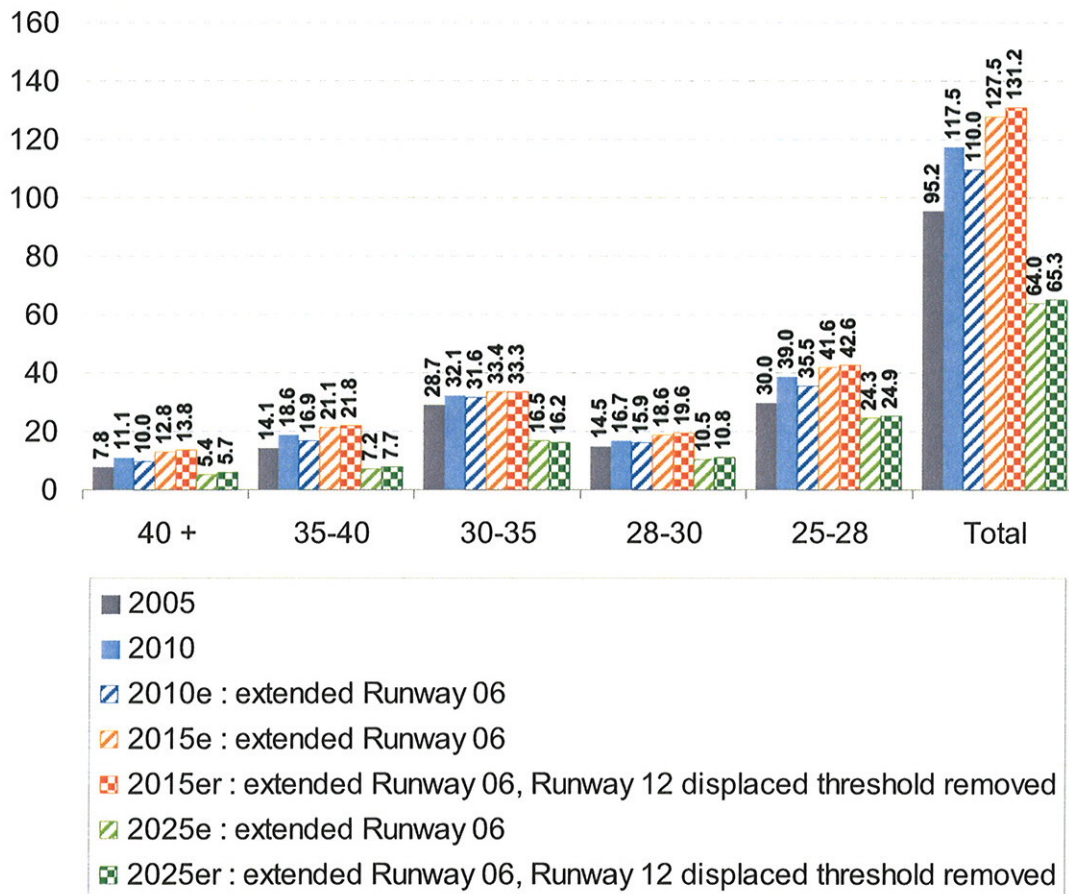
**Figure 12.**  
**2025 Noise Exposure Projection**  
**Extended Runway 06, Runway 12 displaced threshold removed**  
**John C. Munro Hamilton International Airport**



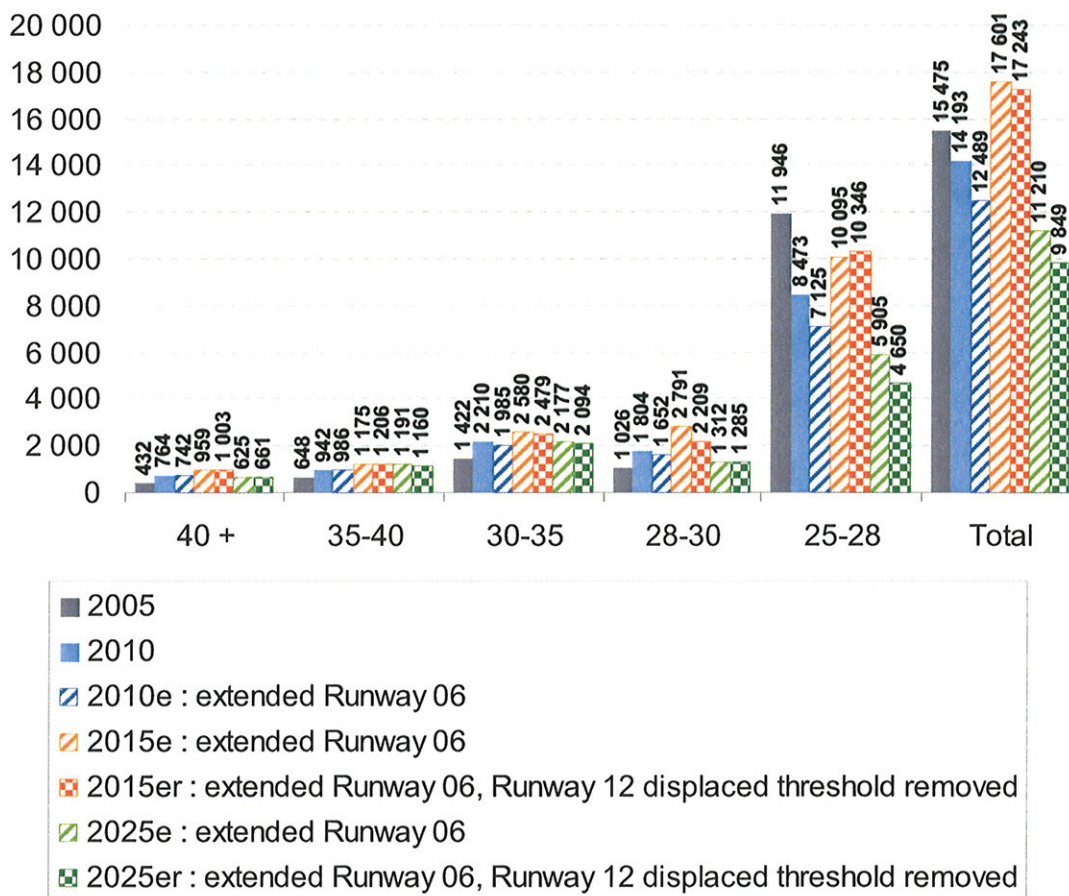


Surface area and population under the noise exposure contours are presented in figures 13 and 14.

**Figure 13. Surface area (km<sup>2</sup>)**



**Figure 14. Population**



In table 7 below compares the total surface area and population with 2005. The noise exposure contours expand until 2015 but shrink considerably from 2015 to 2025. Several factors are responsible for these variations:

- the constant increase of itinerant traffic, doubling from 2005 to 2025, causes expansion of the noise exposure contours;
- the evolution of the fleet mix, with an increasing proportion of larger aircraft, also causes the noise exposure contours to expand;
- the phase out of older and noisier aircraft (Boeing 727 and 737-200) from 2015 to 2025 has a considerable effect in shrinking the 2025 noise exposure contours to a surface area quite

smaller than it was in 2005, the shrinking is comprehensible considering that the footprint of a Boeing 727 is 30 times larger than the footprint of a Boeing 767;

- the extension of Runway 06, with the runway use modification coming with it, brings a 6% reduction of the total surface area of the noise exposure contours in 2010;
- the removal of the displaced threshold of Runway 12-30, bringing its landing length to 10 000 feet, causes a slight increase in the surface area of the noise exposure contours in 2015 and 2025.

**Table 7. Comparison of surface area and population**

<i>NEF / NEP</i>	<i>Surface area</i>		<i>Population</i>	
	<i>km<sup>2</sup></i>	<i>vs. 2005</i>	<i>Number</i>	<i>vs. 2005</i>
2005	95.2	-	15 475	-
2010	117.5	+23%	14 193	-8%
2010e	110.0	+16%	12 489	-19%
2015e	127.5	+34%	17 601	+14%
2015er	131.2	+38%	17 243	+11%
2025e	64.0	-33%	11 210	-28%
2025er	65.3	-31%	9 849	-36%



## 4. CONCLUSION

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The noise exposure contours, forecasts, and projections have been computed in accordance with Transport Canada methodology. Surface area and population counts under each set of contours were also compiled.

The noise exposure contours will expand until 2015 but shrink considerably from 2015 to 2025. The expansion of the noise exposure contours is caused mainly by itinerant traffic increase and larger aircraft proportion increase. The shrinkage of the noise exposure contours, from 2015 to 2025, is caused mainly by the phase out of older and noisier aircrafts, the phase out will predominate over the other factors in the 2015 to 2025 period. The extension of Runway 06 will also contribute to the reduction of noise in the vicinity of the airport.

## BIBLIOGRAPHY

INTERNATIONAL CIVIL AVIATION ORGANIZATION, Recommended standards and practices, Environment protection, Appendix 16 to the international civil aviation convention, Volume 1, "Aircraft Noise", second edition, 1988.

TRANSPORT CANADA, Aviation Group, « NEF micro computer system user manual », June 1990, TP 6907.

TRANSPORTS CANADA, « Land use planning in the vicinity of airports », 2006, TP 1247.

TRANSPORTS CANADA, « Air Traffic Designators », TP 143, 2005.

FAA, U.S. Department of transportation, Advisory Circular AC36-1h, « Noise Levels for U.S. Certificated and Foreign Aircraft », 2001.



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## APPENDIX 1

### Detailed fleet structure





Hamilton

Draft Report – NOISE IMPACT AND EVALUATION STUDY, JOHN C. MUNRO HAMILTON INTERNATIONAL AIRPORT

Aircraft	D1*	D2*	D3*	D4*	Chapter	MTOW	Manufacturer	Model	NEFCAL ID	Number
1111		1	P						SKYHAWK**	3
A109	L	2	H	R		3 000	AGUSTA	A-109, Power	BH12/CH135**	8
A119	L	1	H	R		2 700	AGUSTA	AGUSTA	BH06**	2
A124	H	4	J	R	2	405 000	ANTONOV	An-124 Ruslan	74720B	5
A306	H	2	J	R	3	172 000	AIRBUS	A-300B4-600	A310	1
A310	H	2	J	R	3	164 000	AIRBUS	A-310 (CC-150 Polaris)	A310	53
A319	M	2	J	R	3	76 000	AIRBUS	A-319	EA32**	18
A320	M	2	J	R	3	77 000	AIRBUS	A-320	EA32**	72
A321	M	2	J	R	3	83 000	AIRBUS	A-321	EA32**	4
A748	M	2	T	R		22 000	HAWKER SIDDELEY	HS-748	HS748A	2
AA1	L	1	P	F		1 000	AMERICAN	AA-1 Yankee, Trainer, Tr2	SKYHAWK**	2
AA5	L	1	P	F		1 000	AMERICAN	AA-5 Traveler	SKYHAWK**	12
AC11	L	1	P	R		2 000	ROCKWELL	112, 114 Commander, Alpine Commander	GASEPF	18
AC12	L	1	P	R		2 000	ROCKWELL INT. CORP.	ROCKWELL INT. CORP.	GASEPF	4
AC90	L	2	T	R		5 000	ROCKWELL	690/840 Turbo/Jetprop Commander 840	CNA441	7
AC95	L	2	T	R		6 000	ROCKWELL	695 Jetprop Commander 980/1000	CNA441	1
AEST	L	2	P	R		3 000	PIPER	PA-60, Aerostar	BEC58P	88
AN12	M	4	T	R		61 000	ANTONOV	An-12	C130	2
AN24	M	2	T	R		22 000	ANTONOV	An-24	CVR580	1
AS50	L	1	H	F		3 000	AEROSPATIALE	AS-350/550 Ecureuil, Astar, SuperStar, Fennec	HR35**	91
AS55	L	2	H	F		3 000	AEROSPATIALE	AS-355/555 Ecureuil 2, TwinStar, Fennec	BH12/CH135**	38
AS65	L	2	H	F		4 100	AEROSPATIALE	SA365N1 Dauphin 2	BH12/CH135**	6
ASTR	M	2	J	R	3	11 000	IAI	1125 Astra (C-38)	IA1125	534
ATRH	L	1	P			600	Evektor-Aerotechnik a.s.	SPORTSTAR	SKYHAWK**	1
B06	L	1	H	F		2 000	BELL	206A/B/L, 406, LongRanger (JetRanger)	BH06**	558
B190	M	2	T	R		8 000	BEECH	1900 Airliner (C-12J)	DHC6	1 761



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B212	L	2	H	F	6 000	BELL	212, Twin Two-Twelve (UH-1N, Twin Huey)	BH12/CH135**	58
B222	L	2	H	R	4 000	BELL	222	BH22**	2
B25	M	2	P	R	16 000	NORTH AMERICAN	B-25, TB-25, PBJ Mitchell	NAVAJO**	15
B350	M	2	T	R	6 000	BEECH	B300 Super King Air 350	DHC6	222
B412	L	2	H	F	6 000	BELL	412, Griffon (CH-146)	BH12/CH135**	22
B430	L	2	H	R	5 000	BELL	430	BH12/CH135**	2
B721	M	3	J	R	2	77 000 BOEING	727-100 (C-22)	727Q7	64
B722	M	3	J	R	2	96 000 BOEING	727-200	727Q15	5 437
B732	M	2	J	R	2	53 000 BOEING	737-200, Surveiller (CT-43, VC-96)	737D17	880
B733	M	2	J	R	3	63 000 BOEING	737-300	737300	2
B735	M	2	J	R	3	61 000 BOEING	737-500	B73F**	130
B737	M	2	J	R	3	78 000 BOEING	737-700, BBJ (C-40)	B73F**	3 275
B738	M	2	J	R	3	77 000 BOEING	737-800	B73F**	743
B752	M	2	J	R	3	116 000 BOEING	757-200 (C-32)	757RR	585
B762	H	2	J	R	3	180 000 BOEING	767-200	767JT9	9
B763	H	2	J	R	3	187 000 BOEING	767-300	767JT9	10
BE10	L	2	T	R	6 000	BEECH	100 King Air (U-21F)	DHC6	217
BE18	L	2	P	R	4 000	BEECH	18 (C-45 Expeditor)	BEC58P	154
BE19	L	1	P	F	1 000	BEECH	19 Musketeer Sport, Sport	BEC58P	26
BE20	L	2	T	R	6 000	BEECH	200, 1300 Super King Air, Commuter (C-12A)	SD330	255
BE23	L	1	P	F	2 000	BEECH	23 Musketeer, Sundowner	GASEPF	10
BE30	M	2	T	R	7 000	BEECH	300 Super King Air	DHC6	29
BE33	L	1	P	R	2 000	BEECH	33 Bonanza (E-24)	GASEPV	94
BE35	L	1	P	R	2 000	BEECH	35 Bonanza	GASEPV	24
BE36	L	1	P	R	2 000	BEECH	36 Bonanza	GASEPV	50
BE40	M	2	J	R	3	8 000 BEECH	400 BeechJet (T-1, T-400)	CNA500	81
BE55	L	2	P	R	3 000	BEECH	55 Baron (T-42)	BEC58P	58



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BE58	L	2	P	R	3 000	BEECH	58 Baron	BEC58P	162
BE60	L	2	P	R	4 000	BEECH	60 Duke	BEC58P	4
BE65	L	2	P	R	4 000	BEECH	65 Queen Air (U-8F Seminole)	BEC58P	2
BE76	L	2	P	R	2 000	BEECH	76 Duchess	BEC58P	2
BE95	L	2	P	R	2 000	BEECH	95 Travel Air	BEC58P	8
BE99	L	2	T	R	5 000	BEECH	99 Airliner	DHC6	1 028
BE9L	L	2	T	R	5 000	BEECH	90, A90-E90 King Air (T-44, VC-6)	CNA441	726
BE9T	L	2	T	R	5 000	BEECH	F-90 King Air	CNA441	4
BK17	L	2	H	F	4 000	MBB	BK-117	BH12/CH135**	4
BL8	L	1	P	F	2 000	BELLANCA	8 Decathlon, Scout	SKYHAWK**	3
C130	M	4	T	R	71 000	LOCKHEED	Hercules	C130	34
C150	L	1	P	F	1 000	CESSNA	150, A150, Commuter, Aerobat	SKYHAWK**	110
C152	L	1	P	F	1 000	CESSNA	152, A152, Aerobat	SKYHAWK**	546
C170	L	1	P	F	1 000	CESSNA	170	SKYHAWK**	6
C172	L	1	P	F	2 000	CESSNA	172, P172, R172, Skyhawk, Cutlass (T-41)	SKYHAWK**	1 153
C177	L	1	P	F	2 000	CESSNA	177, Cardinal	SKYHAWK**	142
C180	L	1	P	F	2 000	CESSNA	180, Skywagon 180 (U-17C)	SKYHAWK**	6
C182	L	1	P	F	2 000	CESSNA	182, Skylane	SKYHAWK**	364
C185	L	1	P	F	2 000	CESSNA	185, A185 Skywagon, Skywagon 185 (U-17A/B)	SKYHAWK**	39
C195	L	1	P	F	2 000	CESSNA	195 (LC-126)	SKYHAWK**	4
C206	L	1	P	F	2 000	CESSNA	206, P206, T206, TP206, Super Skywagon	SKYHAWK**	173
C207	L	1	P	F	2 000	CESSNA	207 (Turbo) Stationair	SKYHAWK**	3
C208	L	1	T	F	4 000	CESSNA	208 Caravan 1, (Super)Cargomaster	GASEPF	3 868
C210	L	1	P	R	2 000	CESSNA	Centurion	SKYHAWK**	75
C212	M	2	T	F	8 000	CASA	C-212 Aviocar (T-12, D-3, Tp-89)	CNA441	21
C25A	L	2	J	R	3	5 613	CESSNA AIRCRAFT CO. 525	CNA500	36
C310	L	2	P	R	3 000	CESSNA	310, T310 (U-3, L-27)	BEC58P	76



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C320	L	2	P	R	3 000	CESSNA	320 (Executive)Skynight	BEC58P	2
C335	L	2	P	R	3 000	CESSNA	335	BEC58P	2
C340	L	2	P	R	3 000	CESSNA	340	BEC58P	23
C402	L	2	P	R	3 000	CESSNA	401, 402, Utililiner, Businessliner	BEC58P	6
C404	L	2	P	R	4 000	CESSNA	404 Titan	BEC58P	4
C414	L	2	P	R	3 000	CESSNA	414, Chancellor	BEC58P	73
C421	L	2	P	R	4 000	CESSNA	421, Golden Eagle, Executive Commuter	BEC58P	54
C425	L	2	T	R	4 000	CESSNA	425 Corsair, Conquest 1	CNA441	12
C441	L	2	T	R	5 000	CESSNA	441 Conquest, Conquest 2	CNA441	12
C500	L	2	J	R	6 000	CESSNA	500 Citation, Citation 1	CNA500	2
C501	L	2	J	R	6 000	CESSNA	501 Citation 1SP	CNA500	29
C525	L	2	J	R	5 000	CESSNA	525 CitationJet, Citation CJ1	CNA500	132
C550	M	2	J	R	7 000	CESSNA	550, S550, 552 Citation 2/S2/Bravo	MU3001	655
C560	M	2	J	R	8 000	CESSNA	560 Citation 5/5 Ultra, Citation 5 Ultra Encore	MU3001	85
C56X	M	2	J	R	9 000	CESSNA	560XL Citation Excel	MU3001	150
C650	M	2	J	R	10 000	CESSNA	650 Citation 3/6/7	LEAR35	66
C680	M	2	J	R	13 600	CESSNA AIRCRAFT CO.	Cessna 680	LEAR35	4
C72R	L	1	P	R	2 000	CESSNA	172RG Cutlass RG	SKYHAWK**	109
C750	M	2	J	R	15 000	CESSNA	750 Citation 10	CL600	41
C77R	L	1	P	R	2 000	CESSNA	177RG Cardinal RG	GASEPV	8
C82R	L	1	P	R	2 000	CESSNA	R182, TR182 (Turbo)Skylane RG	SKYHAWK**	1
CAT	M	2	P	A	14 000	CONSOLIDATED	PBY, OA-10, A-10 Catalina, Canso (28)	NAVAJO**	24
CH7A	L	1	P	F	2 000	CHAMPION	Citabria, Traveler, Tri-Con, Tri-Traveler	SKYHAWK**	9
CL30	M	2	J	R	17 000	BOMBARDIER	BD-100 Challenger 300	CL601	6
CL60	M	2	J	R	15 000	CANADAIR	CL-600/601/604 Challenger (CC-144)	CL601	209
COL3	L	1	P		1 500	Lancair	LC40-550FG	SKYHAWK**	2
CRJ1	M	2	J	R	22 000	CANADAIR	RJ-100 Regional Jet	CL601	25

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CRJ2	M	2	J	R	3	24 000	CANADAIR	RJ-200 Regional Jet	CL601	1 145
CVLP	M	2	P	R		23 000	CONVAIR	CV-240/340/440 Convairliner	DC3	2
CVLT	M	2	T	R		25 000	CONVAIR	CV-540/580/600/640 (VC-131H)	CVR580	90
DA40	L	1	P			1 200	DIAMOND AIRCRAFT	DA40	SKYHAWK**	28
DC3	M	2	P	R		13 000	DOUGLAS	DC-3 (C-41, C-47 Skytrain, Skytrooper, Dakota)	DC3	4
DC3T	M	2	T	R		13 000	PROFESSIONAL AVIATI	Jet Prop DC-3 (C-47TP Super Dakota)	DHC6	2
DC4	M	4	P	R		34 000	DOUGLAS	DC-4 (C-54 Skymaster)	DC6	2
DC86	H	4	J	R	2	152 000	MCDONNELL DOUGLAS	DC-8-60	DC8QN	23
DC87	H	4	J	R	3	162 000	MCDONNELL DOUGLAS	DC-8-70	DC870	23
DC91	M	2	J	R	2	42 000	DOUGLAS	DC-9-10	DC910	155
DC93	M	2	J	R	2	55 000	DOUGLAS	DC-9-30	DC9Q9	359
DH2T	L	1	T	F		3 000	DE HAVILLAND	DHC-2 Mk3 Turbo Beaver	GASEPV	2
DH82	L	1	P	F		1 000	DE HAVILLAND	DH-82 Tiger Moth, Queen Bee	GASEPV	10
DH8A	M	2	T	R		16 000	DE HAVILLAND	DHC-8-100 Dash 8 (E-9, CT-142, CC-142)	DHC8	13
DH8C	M	2	T	R		20 000	DE HAVILLAND	DHC-8-300 Dash 8	DHC8	9
DH8D	M	2	T	R		26 000	DE HAVILLAND	DHC-8-400 Dash 8	DHC8	2
DHC1	L	1	P	F		1 000	DE HAVILLAND	DHC-1 Chipmunk	GASEPV	45
DHC6	L	2	T	F		6 000	DE HAVILLAND	DHC-6 Twin Otter (CC-138)	DHC6	6
DHC7	M	4	T	R		20 000	DE HAVILLAND	DHC-7 Dash 7 (O-5, EO-5)	DHC7	5
DV20	L	1	P	F		1 000	DIAMOND	DA-20/22, DV-20 Katana, Speed Katana	SKYHAWK**	99
E110	M	2	T	R		6 000	EMBRAER	EMB-110/111 Bandeirante (C/EC/P/R/SC-95)	DHC6	17
E120	M	2	T	R		10 000	EMBRAER	EMB-120 Brasilia (VC-97)	DHC6	2
E135	M	2	J	R	3	19 000	EMBRAER	ERJ-135	CL600	2
E145	M	2	J	R	3	21 000	EMBRAER	ERJ-145	CL600	2
E170	M	2	J	R	3	34 000	EMBRAER	ERJ-170	CL601	10
EC20	L	1	H	F		2 000	EUROCOPTER	EC-120 Colibri	HR33**	10
EC30	L	1	H	F		2 400	EUROCOPTER	Eurocopter EC130B4	HR35**	6





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EC50	L	2	H	F	4 800	EUROCOPTER	EUROCOPTER	HR35**	1
EC55	L	2	H	F	4 800	EUROCOPTER	Eurocopter EC155B/B1	HR35**	57
EH10	M	3	H	R	15 000	WESTLAND	EH-101, Merlin, Helliner, Cormorant	BH12/CH135**	22
ERCO	L	1	P	F	1 000	ALON	A-2 Aircoupe	SKYHAWK**	1
F100	M	2	J	R	3	45 000	FOKKER 100	CL600	12
F18	M	2	J	R	0	23 000	MCDONNELL DOUGLAS FA-18, CF-188, Hornet, Super Hornet	F18**	7
F28	M	2	J	R	2	30 000	FOKKER F-28 Fellowship	F28MK2	2
F2TH	M	3	J	R	3	17 000	DASSAULT Falcon 2000	CL600	28
F406	L	2	T	R	5 000	CESSNA	F406 Caravan 2	CNA441	8
F8L	L	1	P		850	Sequoia	FALCO	SKYHAWK**	62
F900	M	3	J	R	3	21 000	DASSAULT Falcon 900 Mystere 900 (T-18)	LEAR35	59
FA10	M	2	J	R	3	9 000	DASSAULT Falcon 10, Mystere 10	LEAR35	74
FA11	L	1	P	F	1 000	FAIRCHILD	F-11 Husky	SKYHAWK**	10
FA20	M	2	J	R	3	15 000	DASSAULT Falcon 20, Mystere 20 (T-11, TM-11)	LEAR35	427
FA50	M	3	J	R	3	18 000	DASSAULT Falcon 50, Mystere 50 (T-16)	LEAR35	51
FA62	L	1	P	F	2 000	FAIRCHILD	M-62 (PT-19/23/26, T-19 Cornell)	SKYHAWK**	31
FBA2	L	1	P	F	2 000	FOUND	FBA-2, Bush Hawk	SKYHAWK**	2
FFLY	M	1	P		7 300	Fairey Aviation	F.F. 46 FIREFLY	SKYHAWK**	17
FINC	L	1	P	F	1 000	FLEET	10, 11, 16 (Finch)	SKYHAWK**	2
FL21	L	2	P	F	2 000	FLEET	Fleet 60K (Fort)	NAVAJO**	8
FURY	L	1	P		5 200	HAWKER	HAWKER MARK 20	SKYHAWK**	43
G159	M	2	T	R	16 000	GRUMMAN	G-159 Gulfstream 1 (TC-4 Academe, VC-4)	HS748A	2
GALX	M	2	J	R	3	16 000	IAI 1126 Galaxy	IA1125	14
GLEX	M	2	J	R	3	42 000	BOMBARDIER BD-700 Global Express	CL600	124
GLF2	M	2	J	R	2	32 000	GRUMMAN G-1159, G-1159B Gulfstream 2 (C-20J, VC-11)	GIIB	15
GLF3	M	2	J	R	2	32 000	GULFSTREAM G-1159A Gulfstream 3 (C-20A/B/C/D/E)	GIIB	8
GLF4	M	2	J	R	3	34 000	GULFSTREAM G-1159C Gulfstream 4 (C-20F/G/H)	CL600	26





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GLF5	M	2	J	R	3	41 000	GULFSTREAM	G-1159D Gulfstream 5 (C-37)	CL600	2
GLTU	L	1	T			1 300	Glasair/J.T.S. SADLER	GLASAIR III TURBINE	DC3	36
H25A	M	2	J	R	2	12 000	HAWKER SIDDELEY	HS-125-1/2/3/400/600 (Dominie, EC-93)	LEAR25	5
H25B	M	2	J	R	3	13 000	HAWKER SIDDELEY	HS-125-700	LEAR35	220
H25C	M	2	J	R	3	15 000	BRITISH AEROSPACE	Bae-125-1000	LEAR35	2
H269	L	1	H	F		1 000	SCHWEIZER	269, 300, TH-300, Sky Knight (TH-55 Osage)	BH47/H13**	8
H500	L	1	H	F		2 000	MCDONNELL DOUGLAS	MD-500, MD-530F/MG, Defender, Nightfox	BH06**	11
H53	M	2	H	R		34 000	SIKORSKY	S-65 (CH-53A/C/D/G Sea Stallion)	HV34/CH47**	2
IL76	H	4	J	R	2	190 000	ILYUSHIN	IL-76/78/82, Gajaraj	DC8QN	2
J3	L	1	P	F		1 000	PIPER	J-3 Cub (L-4, NE)	GASEPF	1
JS31	M	2	T	R		7 000	BRITISH AEROSPACE	Bae-3100 Jetstream 31 (T.Mk.3)	BA31**	214
L188	M	4	T	R		53 000	LOCKHEED	L-188 Electra	L188	2
LA25	L	1	P	A		2 000	LAKE	LA-250/270 Renegade, Seawolf, Seafury	GASEPV	4
LA4	L	1	P	A		2 000	LAKE	LA-4/200, Buccaneer	GASEPV	32
LANC	M	4	P	R		23 000	AVRO	683 Lancaster	DC6	102
LJ24	M	2	J	R	2	7 000	LEARJET	24	LEAR25	79
LJ25	M	2	J	R	2	7 000	LEARJET	25	LEAR25	108
LJ31	M	2	J	R	3	8 000	LEARJET	31	LEAR35	12
LJ35	M	2	J	R	3	9 000	LEARJET	35, 36 (C-21, C-35, R-35, VU-35, RC-36, U-36)	LEAR35	167
LJ40	M	2	J	R	3	9 231	LEARJET CORP.	40	LEAR35	4
LJ45	M	2	J	R	3	10 000	LEARJET	45	LEAR35	50
LJ55	M	2	J	R	3	10 000	LEARJET	55	LEAR35	20
LJ60	M	2	J	R	3	11 000	LEARJET	60	LEAR35	65
LNC2	L	1	P	R		1 000	LANCAIR	Lancair 200/235/320/360	SKYHAWK**	1
LNC4	L	1	P	F		2 000	LANCAIR	Lancair 4	SKYHAWK**	2
M20P	L	1	P	R		2 000	MOONEY	M-20, M-20A-J/L/R (non-turbocharged)	GASEPV	42
M20T	L	1	P	R		2 000	MOONEY	M-20KM, Bravo, Encore (turbocharged)	GASEPV	111



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M4	L	1	P	F	2 000	MAULE	M-4 Bee Dee, Jetasen, Rocket, Astro Rocket	SKYHAWK**	7
M7	L	1	P	F	2 000	MAULE	M-7-235, MT-7 Super Rocket, Star Rocket	SKYHAWK**	2
MD82	M	2	J	R	3	68 000 MCDONNELL DOUGLAS MD-82		MD82	10
MD83	M	2	J	R	3	73 000 MCDONNELL DOUGLAS MD-83		MD83	6
MS76	L	2	J	R	2	MORANE-SAULNIER	MORANE-SAULNIER	LEAR25	4
MU2	L	2	T	R	5 000	MITSUBISHI	MU-2, Marquise, Solitaire (LR-1)	DHC6	189
NK	L	1	P	R	2 300	VICKERS/SUPERMARINE	SPLITFIRE	SKYHAWK**	2
P180	L	2	T	R	6 000	PIAGGIO	P-180 Avanti	DHC6	153
P28A	L	1	P	F	2 000	PIPER	PA-28-140/150/160/180 Archer, Cadet, Cherokee	GASEPF	63
P28B	L	1	P	F	2 000	PIPER	PA-28-201T/235/236 Cherokee, Dakota	GASEPV	6 159
P28R	L	1	P	R	2 000	PIPER	PA-28R-180/200/201 Cherokee Arrow	GASEPV	203
P28T	L	1	P	R	2 000	PIPER	PA-28RT Arrow 4, Turbo Arrow 4	GASEPV	47
P3	M	4	T	R	65 000	LOCKHEED	P-3 Orion, CP-140 Aurora, Arcurus (L-185)	C130	12
P32R	L	1	P	R	2 000	PIPER	PA-32R Cherokee Lance, Saratoga SP, Turbo	GASEPV	30
P46T	L	1	T	R	2 000	PIPER	PA-46T Malibu Meridian	GASEPF	162
P51	L	1	P	R	5 000	NORTH AMERICAN	P-51, F-51, A-36 Mustang	SKYHAWK**	4
PA12	L	1	P	F	1 000	PIPER	PA-12 Super Cruiser	GASEPF	4
PA18	L	1	P	F	1 000	PIPER	PA-18 Super Cub (L-18C, L-21, U-7)	GASEPF	10
PA22	L	1	P	F	1 000	PIPER	PA-22 Tri-Pacer, Caribbean, Colt	GASEPF	68
PA23	L	2	P	R	2 000	PIPER	PA-23-150/160 Apache	BEC58P	6
PA24	L	1	P	R	2 000	PIPER	PA-24 Comanche	GASEPV	170
PA25	L	1	P	F	2 000	PIPER	PA-25 Pawnee	GASEPV	1
PA27	L	2	P	R	3 000	PIPER	PA-23-235/250 Aztec, Turbo Aztec (U-11)	GASEPV	303
PA30	L	2	P	R	2 000	PIPER	PA-30/39 Twin Comanche	BEC58P	193
PA31	L	2	P	R	4 000	PIPER	PA-31/31P Navajo, Chieftain, Mojave, T-1020	BEC58P	333
PA32	L	1	P	F	2 000	PIPER	PA-32 Cherokee Six, Saratoga, Turbo Saratoga	GASEPV	143
PA34	L	2	P	R	3 000	PIPER	PA-34 Seneca	BEC58P	224





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PA38	L	1	P	F	1 000	PIPER	PA-38 Tomahawk	GASEPF	468
PA44	L	2	P	R	2 000	PIPER	PA-44 Seminole, Turbo Seminole	GASEPV	698
PA46	L	1	P	R	2 000	PIPER	PA-46 Malibu, Malibu Mirage	GASEPV	47
PAY1	L	2	T	R	5 000	PIPER	PA-31T1-500 Cheyenne 1	CNA441	96
PAY2	L	2	T	R	5 000	PIPER	PA-31T-620/T2-620 Cheyenne, Cheyenne 2	CNA441	501
PAY3	L	2	T	R	6 000	PIPER	PA-42-720 Cheyenne 3	CNA441	46
PC12	L	1	T	R	5 000	PILATUS	PC-12, Eagle	CNA441	513
R22	L	1	H	F	1 000	ROBINSON	R-22	BH47/H13**	1
R44	L	1	H	F	2 000	ROBINSON	R-44 Astro	BH06**	27
RBEL	L	1	P		750	Murphy	Murphy	SKYHAWK**	6
RC70	L	2	P	R	3 000	ROCKWELL	700, 710 Commander	BEC58P	39
RV4	L	1	P	F	1 000	VAN'S	RV-4	SKYHAWK**	2
RV6	L	1	P	F	1 000	VAN'S	RV-6	SKYHAWK**	4
RV7	L	1	P		800	VAN'S	RV-7A	SKYHAWK**	299
RV8	L	1	P		900	Harmon	HARMON ROCKET II	SKYHAWK**	3
S10	L	1	P	F	2 000	STINSON	10, 105, HW-75, HW-80, Voyager	SKYHAWK**	2
S61	M	2	H	R	9 000	SIKORSKY	S-61A/B/D/L/N (CH-124 Sea King)	SK76/H60**	3
S76	L	2	H	R	5 000	SIKORSKY	S-76, H-76, AUH-76, Spirit, Eagle (HE-24)	SK76/H60**	161
SC7	L	2	T	F	6 000	SHORT	SC-7 Skyvan, Skyliner	CNA441	21
SEAW	L	1	P		1 500	SEAWIND	SEAWIND	SKYHAWK**	4
SF34	M	2	T	R	12 000	SAAB	340 (S100 Argus)	SF340	3
SH33	M	2	T	R	10 000	SHORT	SD3-30, 330, Sherpa (C-23)	SD330	10
SH36	M	2	T	R	12 000	SHORT	SD3-60, 360	SD330	97
SR20	L	1	P	F	2 000	CIRRUS	SR-20	SKYHAWK**	44
SR22	L	1	P		1 500	CIRRUS	SR22	SKYHAWK**	111
ST75	L	1	P	F	2 000	BOEING	75 Kaydet	SKYHAWK**	565
SW3	M	2	T	R	6 000	FAIRCHILD	SA-226TB, SA-227TT Merlin 3	CNA441	21



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SW4	M	2	T	R	8 000	FAIRCHILD	Metro 3/23, Expediter 23, Merlin 23/23E	CNA441	24
T2	L	1	J	R	6 000	ROCKWELL INT. CORP.	Buckeye T-20	LEAR25	2
T28	L	2	P	R	4 000	NORTH AMERICAN	T-28, AT-28, Trojan	NAVAJO**	8
T6	L	1	P	R	4 000	NORTH AMERICAN	T-6, AT-6, BC-1, SNJ, Texan, Harvard	SKYHAWK**	513
TAYB	L	1	P		500	Taylorcraft	TC12D	SKYHAWK**	1
TBM7	L	1	T	R	3 000	SOCATA	TBM-700	GASEPF	12
TC12	L	1	P	F	1 000	TAYLORCRAFT	TC12D	SKYHAWK**	1
TCRH	L	1	P	F	600	Tecnam	Tecnam	SKYHAWK**	11
TEX2	L	1	T	R	4 000	RAYTHEON	T-6 Texan 2, CT-156 Harvard 2	GASEPF	4
TF19	L	1	P	F	1 000	TAYLORCRAFT	19, F-19 Sportsman	SKYHAWK**	1
TRIN	L	1	P	R	2 000	SOCATA	TB-20/21 Trinidad	SKYHAWK**	8
UH1	L	1	H	F	5 000	BELL	204, 205 (UH-1A-M Huey)	BH05**	4
ULAC	L	1	P	F	1 000	ULTRA LIGHT	ultralight/microlight aircraft/aéronef ultra-léger	SKYHAWK**	2
VAMP	1	J			6 000	De Havilland	DH115 Vampire T.55	T1114**	2
WACO	L	1	P	F	2 000	WACO	O, E, GXE, CTO	SKYHAWK**	2
WW24	M	2	J	R	3	11 000 IAI	1124 Westwind, Westwind 1/2, Sea Scan	LEAR35	43
XL2	L	1	P	F		LIBERTY	XL-2	SKYHAWK**	2
Z42	L	1	P	F	2 000	ZLIN	Z-42/142/242	SKYHAWK**	13

\*\* : Noise data in the RUN file.

\*D1 : Weight : \*D2 : Number of engines \*D3 : Engine type : \*D4 : Landing gear :

L – light P – pistons F – fix  
M – medium T – turboprop R – retractable  
H – heavy J – jet A – amphibian

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## APPENDIX 2

### Synthesis of movements

## Itinerant aircraft classes

Aircraft	Arrivals			Departures			Total
	Day	Night	Total	Day	Night	Total	
Helicopter 1 engine	323	40	363	342	17	359	722
Helicopter 2 engines	149	44	193	153	36	189	382
Jet 1 engine non-certificated	1	1	2	2	0	2	4
Jet 2 engines non-certificated	4	1	5	6	0	6	11
Jet 2 engines chapter 2 and HK <sup>1</sup>	504	266	770	478	363	841	1 611
Jet 2 engines chapter 3	3 191	1 560	4 751	3 178	1 493	4 671	9 422
Jet 3 engines chapter 2 and HK <sup>1</sup>	1 613	1 142	2 755	783	1 963	2 746	5 501
Jet 3 engines chapter 3	39	16	55	35	20	55	110
Jet 4 engines chapter 2 and HK <sup>1</sup>	11	4	15	12	3	15	30
Jet 4 engines chapter 3	9	2	11	10	2	12	23
Pistons 1 engine	5 187	1 032	6 219	5 535	808	6 343	12 562
Pistons 2 engines	1 018	263	1 281	1 045	249	1 294	2 575
Pistons 4 engines	48	3	51	52	1	53	104
Turboprop 1 engine	485	1 796	2 281	906	1 410	2 316	4 597
Turboprop 2 engines	1 772	1 164	2 936	2 098	790	2 888	5 824
Turboprop 4 engines	25	3	28	25	2	27	55
Total	14 379	7 337	21 716	14 660	7 157	21 817	43 533

<sup>1</sup>HK : hushkits

- Day : 7 h - 22 h
- Night : 22 h - 7 h





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## Runway use, arrivals

Aircraft	06		12		24		30		60		99 <sup>2</sup>	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Helicopter 1 engine	0	0	0	0	0	0	0	0	323	40	0	0
Helicopter 2 engines	0	0	0	0	0	0	0	0	149	44	0	0
Jet 1 engine non-certificated	0	1	0	0	0	0	1	0	0	0	0	0
Jet 2 engines non-certificated	0	0	0	0	2	0	1	1	0	0	1	0
Jet 2 engines chapter 2 and HK <sup>1</sup>	37	16	220	101	34	17	206	128	0	0	7	4
Jet 2 engines chapter 3	369	117	899	516	539	185	1 302	729	0	0	82	13
Jet 3 engines chapter 2 and HK <sup>1</sup>	37	25	953	251	99	99	496	745	0	0	28	22
Jet 3 engines chapter 3	1	2	8	6	9	2	19	6	0	0	2	0
Jet 4 engines chapter 2 and HK <sup>1</sup>	0	0	5	1	0	0	5	3	0	0	1	0
Jet 4 engines chapter 3	0	0	5	0	0	0	4	1	0	0	0	1
Pistons 1 engine	1 766	301	208	37	1 653	309	1 083	252	0	0	477	133
Pistons 2 engines	176	58	63	16	201	39	154	69	0	0	424	81
Pistons 4 engines	12	1	1	1	16	0	19	0	0	0	0	1
Turboprop 1 engine	82	553	89	238	112	235	138	755	0	0	64	15
Turboprop 2 engines	249	220	363	253	339	289	761	384	0	0	60	18
Turboprop 4 engines	4	1	7	0	5	1	6	0	0	0	3	1
Total	2 733	1 295	2 821	1 420	3 009	1 176	4 195	3 073	472	84	1 149	289

<sup>1</sup>HK : hushkits.

<sup>2</sup>Runway 99 : missed approach or unknown runway, distributed on runways according to runway use for each specific aircraft type.

## Runway use, departures

Aircraft	06		12		24		30		60		99 <sup>2</sup>	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Helicopter 1 engine	0	0	0	0	0	0	0	0	0	342	17	0
Helicopter 2 engines	0	0	0	0	0	0	0	0	153	36	0	0
Jet 1 engine non-certificated	1	0	0	0	0	0	1	0	0	0	0	0
Jet 2 engines non-certificated	0	0	0	0	2	0	3	0	0	0	1	0
Jet 2 engines chapter 2 and HK <sup>1</sup>	67	30	153	134	50	26	199	169	0	0	9	4
Jet 2 engines chapter 3	698	186	513	225	701	168	1 186	900	0	0	80	14
Jet 3 engines chapter 2 and HK <sup>1</sup>	58	3	326	938	18	9	353	991	0	0	28	22
Jet 3 engines chapter 3	2	8	4	2	13	2	14	8	0	0	2	0
Jet 4 engines chapter 2 and HK <sup>1</sup>	0	0	6	0	0	0	5	3	0	0	1	0
Jet 4 engines chapter 3	0	0	4	0	0	0	6	1	0	0	0	1
Pistons 1 engine	2 067	248	161	17	1 793	243	1 067	167	0	0	447	133
Pistons 2 engines	201	46	34	22	251	54	158	42	0	0	401	85
Pistons 4 engines	20	0	1	0	11	0	20	0	0	0	0	1
Turboprop 1 engine	223	189	114	285	304	762	205	157	0	0	60	17
Turboprop 2 engines	428	145	476	260	590	163	551	205	0	0	53	17
Turboprop 4 engines	6	1	5	0	5	0	6	0	0	0	3	1
Total	3 771	856	1 797	1 883	3 738	1 427	3 774	2 643	495	53	1 085	295

<sup>1</sup>HK : hushkits.

<sup>2</sup>Runway 99 : missed approach or unknown runway, distributed on runways according to runway use for each specific aircraft type.

## Distances (nautical miles)

Aircraft	Departures						Arrivals		Total
	0 - 500	500 - 1000	1000 - 1500	1500 - 2500	2500 - 3500				
Helicopter 1 engine	356	3	0	0	0	0	363	722	
Helicopter 2 engines	186	3	0	0	0	0	193	382	
Jet 1 engine non-certificated	2	0	0	0	0	0	2	4	
Jet 2 engines non-certificated	3	3	0	0	0	0	5	11	
Jet 2 engines chapter 2 and HK <sup>1</sup>	681	128	29	3	0	0	770	1 611	
Jet 2 engines chapter 3	2 373	1 092	1 068	103	35	4 751	2 755	5 501	
Jet 3 engines chapter 2 and HK <sup>1</sup>	516	2 052	174	4	0	2 755	5 501		
Jet 3 engines chapter 3	49	1	3	1	1	55	110		
Jet 4 engines chapter 2 and HK <sup>1</sup>	12	1	0	2	0	15	30		
Jet 4 engines chapter 3	11	0	0	1	0	11	23		
Pistons 1 engine	6 343	0	0	0	0	6 219	12 562		
Pistons 2 engines	1 282	7	0	0	0	0	0		
Pistons 4 engines	53	0	0	0	0	51	0		
Turboprop 1 engine	2 316	0	0	0	0	2 281	0		
Turboprop 2 engines	2 531	353	3	1	0	2 936	5 824		
Turboprop 4 engines	20	5	1	1	0	28	55		
Total	16 734	3 648	1 283	116	36	21 716	43 533		

<sup>1</sup>HK : hushkits.