YQG | YOUR QUICK GATEWAY

WINDSOR INTERNATIONAL AIRPORT

MASTER PLAN 2010

WINDSOR INTERNATIONAL AIRPORT

December 3, 2010

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Windsor International Airport
Master Plan

Prepared for:

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Executive Summary

1. The Windsor International Airport is owned by the City of Windsor and operated by Your Quick Gateway (Windsor) Inc.(YQG), a wholly owned Federal share corporation of the City of Windsor under a long-term management agreement.

2. The Windsor International Airport Master Plan is the overall planning document that will guide the development of the Airport and assist the City and private sector in making land use decisions involving surrounding lands.

3. The Master Plan provides an in-depth profile of the physical conditions and capacities of the Airport's facilities and infrastructure and determines requirements to meet future needs and development potential, while recognizing the financial implications of improvements.

4. The goal of the Master Plan is to stimulate cost effective development on the Windsor International Airport lands through the short (2010-2015), medium (2016-2020) and long-term (2021-2031) planning horizons.

5. The Master Plan builds on the vision of YQG and the City to also facilitate long range planning and development on the surrounding lands that support and reinforce the City's investment in Windsor International Airport.

6. Windsor International Airport has the potential to be a driver of economic activity and support businesses and industries that rely on air transportation.

7. In order to attract increased economic activity to the Airport lands, additional capacity needs to be provided in terms of land available for development with appropriate access and municipal services.

8. The Master Plan addresses these issues and aims to identify lands required for airport related commercial development as well as identify areas for non-airport related employment uses on lands deemed surplus to the projected long-term needs of the Airport.

9. The Windsor International Airport property is approximately 813 hectares in size and is located within the Sandwich South Planning District in the City of Windsor, approximately 8 km south of the Windsor Downtown area.

10. The Airport is part of the Windsor-Essex Region, composed of the City of Windsor and the County of Essex. The Windsor-Essex Region has a strategic gateway location on the Canada/U.S. border. Its proximity to the Metro Detroit area and the location of important transportation infrastructure has allowed Windsor-Essex to be a central focus for NAFTA trans-border business activity.

11. The Windsor-Detroit gateway is the busiest commercial land border crossing in North America – with approximately 3.5 million trucks crossing each year.

12. From a strategic market perspective, the Windsor-Essex Region is centrally located within an 8-hour drive from almost half of the North American population. Detroit's market accounts for an additional 4.5 million people within 65 kilometres of the Airport and about 25 million people can be reached within 400 kilometres.

13. Windsor's strategic gateway location creates opportunities for cross-border, multi-modal business between Detroit/Windsor, the Windsor International Airport and the Sandwich South Planning District. The City of Windsor is a focal point for traffic flows into Canada from the Detroit/Chicago corridor. Windsor is part of the Continental Gateway Initiative, which focuses on developing a sustainable, secure and efficient multi-modal transportation system, including roads, rail, ports, airports, inter-modal facilities and border crossings.

14. The Sandwich South Planning District, which includes the Windsor International Airport, has the potential to become Ontario's primary western business gateway and a major multi-modal hub and logistics cluster for products entering and leaving Canada to the United States. The multi-modal hub links the Airport to Highway 401 and the Lauzon Parkway extension, the Ambassador Bridge, the 3rd International Crossing and Windsor-Essex Parkway, the Detroit-Windsor Tunnel, the Detroit-Windsor Truck Ferry, the Windsor Port, CP Rail and Canadian National Railway.

15. The portion of the Windsor International Airport lands being used for the operating airport are designated "Airport" in the City of Windsor Official Plan.

16. Over 250 hectares of lands on the Airport property located to the east of the operating airport are designated "Future Employment Area" in the Official Plan. These lands are being planned by the City to accommodate non-airport related employment and business park uses in support of the gateway and multi-modal hub concept.

17. Windsor International Airport currently includes an air terminal building, two runways, seven taxiways and two public aprons as well as air navigation facilities, aviation service facilities and other airport support uses. The core development area is located in the southwest quadrant of the Airport property.

18. The existing runways, taxiways and aprons require regular maintenance and periodic resurfacing.

19. The City of Windsor recently invested $1.2 million in infrastructure improvements to the air terminal building. The objective of the project was to improve circulation, provide additional aircraft gates, and expand the capacity of the passenger departure lounge. The interior of the air terminal building was renovated to reflect a modern, up-to-date interior design. The grounds were landscaped in the spring of 2008 to create a strong first impression and recognize the Airport's commitment to protecting the environment.

20. A passenger capacity assessment of the existing air terminal building indicated that space is limited in the international arrivals and baggage hall which affects international processing standards. The terminal building has the capacity to process one international passenger flight at a time within the arrivals hall. This lack of space creates congestion for international flights. The check-in area and concourse are also comparatively undersized, and cannot accommodate multiple departing flights, causing passengers to queue in the concessions and vending area.

21. Regarding air cargo, the Windsor International Airport currently does not provide dedicated cargo services. Any cargo arriving or departing the Airport is handled either on the ramp or through a private/charter flight company on an ad-hoc basis. The Airport has a temporary hangar with a loading dock to accommodate low volumes of cargo.

22. Regarding future business, Windsor International Airport is exploring multiple opportunities for the Airport lands, including an inter-modal cargo transfer facility called a "Cargo Village" and a maintenance/repair/operations facility (MRO) for aircraft. The Cargo Village project includes a cargo transfer facility, forwarding, customs brokers, distributors, warehouses and trucking activities. It is intended that additional non-airport related businesses will develop in the adjacent business park and on surrounding lands in the South Sandwich Planning District.

23. The Cargo Village and MRO projects have far reaching implications for the City of Windsor by helping to "kick start" the development of the multi-modal hub and create new attendant employment opportunities for residents of Windsor-Essex. The Cargo Village's indirect economic benefits include an increase in passenger traffic activity and additional revenue for the Airport.

24. Developing passenger forecasts for Windsor International Airport is difficult because passenger choice of airport is highly sensitive to fare differentials. It is especially significant that travel to high volume Canadian destinations has often been considerably cheaper from Detroit than from Windsor. Services to Canada from

Detroit are often more direct than from Windsor and competition is stronger. These factors make the traffic volumes of any airport in a multi-airport region such as Windsor-Detroit problematic. Traffic depends primarily on the scheduling and pricing decisions of the airlines. It is difficult to quantify latent traffic and actual airport traffic volumes severely underestimate the market size. Therefore a passenger traffic market study is required to determine the true size of the Windsor-Essex market for the Windsor International Airport. There are no satisfactory statistics available to estimate this market in the absence of this type of study.

25. The Master Plan made the following recommendations regarding improvements and major upgrades to airport facilities:

Airfield System

Runways

- Land be reserved for extension of Runway 07-25 to 3,048m (10,000 ft.) in the event of regular use by B747-400 cargo aircraft and these aircraft have a requirement to carry higher loads over longer distances than may be undertaken with the current runway length.
- It is recommended that the Airport continue regular maintenance of runway facilities, particularly Runway 12-30.

Taxiways

- Land be reserved to allow future extension of Taxi 'H' to serve an extension of Runway 07-25 and to provide access to airside commercial land.
- Taxiway be constructed north of Runway 07-25 to provide access to the planned employment lands.
- Taxiway be developed on the east side and parallel to Runway 12-30 to provide access to the new south employment areas This taxiway will also provide access for heavy aircraft to/from these employment lands to Runway 07-25.

Aprons

- Apron I be expanded in the vicinity of Taxi 'G' in the event parking is required on a regular basis for B747-400 cargo aircraft. This will protect the precision approach zoning surface supporting Runway 12-30.
- Land be reserved for westerly expansion of Apron III in the event passenger growth beyond the traffic forecasts is achieved.
- Land reserve be established in the infield adjacent to Taxi 'H' for ultimate development of a new apron and associated air terminal complex.

Capacity

- Due to the current and expected aircraft movement volumes at the Windsor International Airport, the current airside capacity is expected to meet the needs of the Airport for the planning horizon.
- Additional runways will not be required within the planning horizon as current capacity is adequate. The addition of taxiways paralleling Runways 07-25 and 12-30 will further increase the maximum throughput capacity of the runway system.

Air Navigation Facilities

Air Traffic Control Tower

- Land reserve be established in the infield near the intersection of Runways 07-25 and 12-30 for construction of a new control tower should this be required due to development of higher buildings and structures in certain portions of the infield.

Air Terminal Building

Current Air Terminal Capacity

- Estimated that departing passengers in the air terminal are currently experiencing LOS 'B' Level (Conditions of stable flow; high level of comfort); there is adequate space for travelers in pre-boarding security and departure lounge areas.

Operational Deficiencies

- Passengers arriving on international flights are currently experiencing a LOS 'E' or lower during peak periods as the arrival and baggage hall is smaller than the recommended size, suggesting that unstable flow and capacity limiting conditions are present.
- Air terminal building requires a larger capacity for international and trans-border passengers arriving at Windsor International Airport.
- Immediate expansion program be undertaken to provide additional space for passenger check-in queuing, international and trans-border arrivals, related amenities and concessions.
- Current building configuration is not considered optimal as some functions meet or exceed space requirements.
- To achieve a better level of service, the air terminal building be modestly expanded from it current size of 4,716m^2 to 5,250m^2 along with some minor reconfigurations to optimize functional space assignment.

Short-Term Requirements (2010 – 2015)

- Air terminal building ground floor area be expanded to a minimum of 5,800m^2 to serve the projected growth in peak passenger volumes in the short-term (to 2015). Some reconfiguration is also required to achieve an acceptable level of service.
- Areas requiring expansion include Check-in, Passenger Screening, Departures Holdroom, Domestic Arrivals and International Arrivals.
- Given the age of the air terminal building (opened in 1958), an engineering study of the complete building be undertaken to confirm the need, identify costs and develop the optimum strategy for making the required improvements.

Medium-Term (2020) and Long-Term (2030) Requirements

- There is adequate space for significant air terminal expansion in both westerly and southerly directions as existing roads and parking can be realigned.
- Medium-Term and Long-Term expansion follow a westerly axis paralleling the current and future Apron III layout and that expansion proceed southerly towards the groundside to increase the overall width of the air terminal building.

Access Roads and Parking

- The Lauzon Parkway Improvements Environmental Assessment study will confirm the preferred solutions for roadway improvements including the suitability of site access locations to the Airport lands.
- Complete traffic impact studies to confirm external roadway improvement measures to accommodate development.
- Parking study be undertaken immediately to determine current and future demand characteristics and requirements at the Airport.
- Additional lands be reserved in the general vicinity of the air terminal building to accommodate long-term parking growth.

Utilities and Services

Water Supply

- Assessment of the Airport's existing on-site water distribution system be carried out to identify opportunities to modify/expand the existing system.

Stormwater Drainage

- Environmental studies of the woodlot and provincially significant wetlands be updated and compiled in a more comprehensive biological inventory for flora, fauna and aquatic species.
- Comprehensive functional stormwater management study be completed to identify an appropriate strategy for implementing the necessary runoff control and mitigating measures for the development of these lands, including the phased implementation of the stormwater management facilities.

Electrical and Communications

Field Electrical Centre

- Engineering study be undertaken in the short-term to assess the existing systems, equipment and components in the field electrical centre to determine the life expectancy of the facility.

Aircraft Services

Fuel Facilities

- Develop a bulk fuel storage facility on a lot in the employment lands located at the west end of Phelps Drive to permit both airside and/or groundside access for fuel tankers with minimal disruption to Airport operations.

De-icing Facilities.

- Designated de-icing area be established on Apron III as operations increase in the future.

Airport Maintenance

Maintenance and Fire Hall Building

- As airport maintenance requirements increase, that consideration is given to constructing a new maintenance building at an alternate location, including consideration for combining this with emergency response services.

26. The Master Plan provided the following recommendations regarding improvements and major upgrades to general aviation facilities:

Air Cargo

- Develop air cargo facilities in two (2) phases along with a Cargo Village as recommended in Air Cargo Development Study (Lufthansa Consulting).
- Airside service road be constructed linking Apron III to Apron I, and Apron I to the north employment lands as required to support air cargo facilities development.

Cargo Village

- Develop cargo village in accordance with Air Cargo Development Study (Lufthansa Consulting).

Multi-Modal Port

- Lands be reserved for a multi-modal port with a configuration of roughly 235 ha.

Pre-Clearance Facility

- A pre-clearance facility could be located in or adjacent to the air cargo building. If it also serves truck traffic, it would need to be near in or adjacent to the Cargo Village.
- Sufficient land is also available in the Sandwich South area to accommodate a pre-clearance facility.

Aircraft Maintenance and Support

- Lands be reserved for the development of a maintenance, repair and overhaul facility in the airside employment lands.

Airport Business Park

- Lands be reserved for the development of a business park on the lands deemed surplus to the operating airport.

General Aviation

- Lands be se aside to attract new and expand existing general aviation uses.

Airport Related Commercial

- Lands be reserved within the infield area of the Airport property for major Airport related business and employment uses.
- Development of high structures in certain portions of the infield area may interfere with sight lines from the current air traffic control tower. All proposed infield development projects be subject to review by Airport management and if a sight line issue is identified, relocation of the air traffic control tower to a new infield location may be necessary in order for the development to proceed.

27. The Master Plan recommended a Development Plan to meet the current and future airside, air terminal and groundside requirements of Windsor International Airport. The plan allocates sufficient land to accommodate Airport growth beyond the planning horizon.

28. The Development Plan recommended certain projects along with the trigger points when each project will be required.

Development Plan

Project	Phasing Trigger	ROM Cost	Refer. Sect.
Airport Lands			
Construct partial parallel taxiway north of Runway 07-25.	To provide access to new north employment lands, as demand develops.	$ 10 million	5.1.2
Construct taxiway on the east side and parallel to Runway 12-30.	To provide access to the new south employment lands and access by heavy aircraft from these lands to Runway 07-25, as demand develops.	$ 3.5 million	5.1.2
Expand Apron I in the vicinity of Taxi 'G' to accommodate Code E aircraft.	To provide parking for B747-400 cargo aircraft as demand develops and Runway 12-30 requires precision approach zoning protection.	$ 2 million	5.1.3
Maintain Runways to extend the life of these assets.	Short-term repaving of Runway 12-30 (2016).	$ 1.5 million	5.1.1
Construct airside service road linking Apron III to Apron I, and Apron I to the north employment lands.	As required to support air cargo facilities developments.	$210,000	6.2
Expand ATB to approximately 5,250m^2 to provide additional space for passenger check-in queuing, international and trans-border arrivals, related amenities, and concessions.	Immediate requirement to serve current peak hour passengers (TPHP) of 157.	$2.0 million	5.3.3
Expand ATB to 5,800m^2 to meet projected growth in passenger traffic in the short-term.	Expansion anticipated in the short-term (5 years) to serve projected peak hour passenger (TPHP) growth to 253.	$2.5 million	5.3.4
Prepare engineering study of the ATB.	Prepare prior to embarking on ATB improvement programs.	$50,000	5.3.4
Complete drainage and pavement resurfacing of private groundside and airside roadways serving the Airport operations.	Short-term to medium-term need, subject to roadway conditions.	$ 1.5 million	5.4.1
Prepare Airport parking study.	Immediate requirement to determine current and future demand characteristics and requirements for parking.	$35,000	5.4.2
Prepare engineering study of the FEC.	Short-term requirement to assess the existing systems, equipment and components in the FEC and the life expectancy of the facility.	$15,000	5.6.3
Construct a new maintenance building at another location on site, including consideration for combining this with emergency response services needs.	Medium-term, as maintenance requirements increase.	$ 2.5 million	5.9.3
Develop a Secondary Plan/Official Plan Amendment to re-designate future employment area to permit employment uses including a Business Park and establish road and servicing network.	Short-term.	By City Planning & Eng. Depts.	6.6

Project	Phasing Trigger	ROM Cost	Refer. Sect.
Develop Phase I air cargo facility.	Immediate investment to foster air cargo development.	$ TBD	6.3
Develop North Side Employment Lands.	Development of Phase II air cargo facilities, or shortage of general aviation development land.	$ TBD	6.3
Develop South Side Employment Lands.	Development of large MRO and/or aerospace manufacturing on adjacent employment lands.	$ TBD	6.8
Develop Cargo Village.	Assemble as critical mass of related businesses develops on Airport lands in vicinity of each other	$ TBD	6.3
Develop Multi-Modal Port.	Development of Multi-Modal Rail/Truck Facility.	$ TBD	6.4
Complete a stormwater management (SWM) plan for the Airport lands and implement stormwater management measures.	Immediate need for SWM Plan. Short-term to longer-term implementation of SWM facilities in stages as development proceeds.	$50,000 $15.6 million	5.5.3 and 5.10
Protect and maintain environmental sensitive area adjacent the Airport Woodlot.	Immediate to short-term.	N/A	5.5.3 and 5.10
Complete environmental studies to confirm the significance of the natural environment and mitigating measures resulting from development impacts.	Short-term.	$ TBD	5.5.3 and 5.10
Surrounding Lands			
Complete environmental assessment studies for County Road 42 and Lauzon Parkway.	Immediate.	$ TBD	2.4.2
Implement the preferred road improvement alternatives arising from the above environmental assessment studies.	Short to medium-term.	$ TBD	2.4.2
Complete traffic impact studies to confirm external roadway improvement measures to accommodate development.	Progressive studies as development opportunities arise.	$ TBD	2.4.2
Confirm existing water distribution system capacity and associated improvements in the interim until trunk feedermains are completed by WUC.	Immediate to short-term. Trunk watermain facilities from Banwell (North of EC Row) to Cabana (East of Howard).	$ 26.3 million	5.5.1
Complete a sanitary servicing study to confirm the opportunities to expand the drainage area boundary for the trunk sanitary.	Medium-term.	$ 50,000	5.5.2
Complete improvements to the Little River Pollution Control Plant, as required to meet sewage flow demands from the expanded service area.	Longer-term.	$ TBD	5.5.2

29. The Recommended Land Use Plan shown on Figure 7.1 of the Master Plan addresses the short, medium and long-term development potential of the Windsor International Airport.

30. The Recommended Land Use Plan:

- Provides sufficient land to meet the long-term requirements of all essential aviation activities at Windsor International Airport;
- Provides flexibility to accommodate targeted airport and non-airport related business investments that support the development of a strategic gateway and multi-modal hub centred on the Windsor International Airport and the Sandwich South employment area;
- Ensures that land is developed for uses that are compatible with the safe and efficient operation of aircraft at the Windsor International Airport;
- Ensures that land is developed in a manner that is compatible with the adjacent Community;
- Guides the development of Windsor International Airport in a logical and orderly manner ; and
- Protects the interests of the City as well as the tenants within boundaries of the Windsor International Airport property.

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1 Introduction

1.1 Plan Objectives

The Windsor International Airport Master Plan is the overall planning document that will guide the development of the Airport and assist the City and private sector in making land use decisions involving surrounding lands. The Master Plan provides an in-depth profile of the physical conditions and capacities of the Airport's facilities and infrastructure and determines requirements to meet future needs and development potential, while recognizing the financial implications of improvements.

The master planning process builds on the vision of YQG and the City to facilitate long range planning and development on the surrounding lands that support and reinforce the City's investment in Windsor International Airport. The goal of the Master Plan is to stimulate cost effective airport development throughout the short, medium and long-term planning horizons.

The objectives of the Master Plan are:

- to ensure safe operation of all aircraft that utilize the facility;
- to ensure that sufficient land area is reserved for both commercial and non-commercial uses;
- to ensure that Airport development is, to the extent possible, in harmony with the surrounding physical environment;
- to provide guidance to Airport management in day-to-day decisions that protect the Airport's long-term development goals; and
- to provide a strong communication tool to key stakeholders, such as airlines, the aviation industry, industries, and government officials.

1.2 Community Goals and Objectives

The City of Windsor Community Strategic Plan was adopted by Council in 2007. The Plan includes a vision, mission statement, pillars and priorities for the City. It assists in identifying a common vision to guide all future planning, including the Windsor International Airport Master Plan. The Strategic Plan has been linked with the City's five year Review of the Official Plan, departmental business plans and the 2007 budget process reflecting Council's priorities for the 2007-2010 term. The City's vision and mission statement are, respectively:

- **Vision -** Windsor – Dream, Dare, Do: Windsor is a desirable City full of history and potential, with a diverse culture, a durable economy, and a healthy environment, where citizens share a strong sense of belonging and a collective pride of place.
- **Mission -** Our City is built on relationships – between citizens and their government, businesses and public institutions, City and region – all interconnected, mutually supportive, and focused on the brightest future we can create together.

The Community Strategic Plan defines four pillars, each one containing a set of objectives. The following objectives are very relevant to the Windsor International Airport Master Plan:

Pillar 1 - Our Economy: Cultivated & Competitive

- Grow Business – Cultivate a positive and diverse economic environment for business growth.
- Capitalize on Our Strengths – Promote tourism and hospitality, making the most of our advantages as a key Canadian gateway.

Pillar 2 - Our Society: Diverse & Caring

- Invest in Quality Living – Invest in the common good, maintaining convenient City services and enhancing our public spaces.

Pillar 3 - Our Environment: Clean & Efficient

- Maintain Infrastructure – Improve the physical infrastructure, buildings, and public structures.
- Make Transportation Efficient and Convenient – Provide transportation systems that enhance physical mobility and better serve the economic and social needs of all citizens.

Pillar 4 - Our Government: Responsive & Responsible

- Improve Financial Success – Maintain and improve the City's financial health.
- Make Services Responsive – Be accountable for providing top quality municipal services that serve citizens better.
- Form Beneficial Partnerships – Develop innovative partnerships between the public, private, and not for profit sectors.

Consultations with airport stakeholders and staff at the City of Windsor suggest that local residents would like to position the Windsor International Airport as a greater economic driver within the community and the region as a whole.

Stakeholders expressed a desire for the airport to attract a wide variety of businesses, including those within the aviation industry, and non-aviation related businesses.

More specifically, the community wishes to position the Windsor International Airport as an inter-modal cargo facility by providing the capacity for air, road, and potentially rail services.

The Airport has the potential to be a driver of economic activity and support businesses and industries that rely on air transportation. In order to attract increased economic activity to Airport lands, additional capacity needs to be provided in terms of land available for development with appropriate access and municipal services. The Master Plan addresses these issues and aims to identify lands available for airport related commercial development within the short, medium and long-term planning horizons, as well as areas for non-Airport related employment uses on lands surplus to the projected long-term needs of the airport.

2.1 Geographic Context

The Windsor International Airport (CYQG) is situated in Southwestern Ontario, approximately 330 air km from Toronto, and 163 air km from London, Ontario. The Airport is located at 42° 16' 32" north latitude, 82° 57' 20" west longitude, at an elevation of 527.1m Above Sea Level (ASL).

The Airport lands encompass approximately 813 hectares and are located within the City of Windsor, approximately 8 km south of the Windsor Downtown area.

In addition, the Airport is located in the Windsor-Essex Region, composed of the City of Windsor and the County of Essex. The City of Windsor is located in the northwest portion of Essex County. The County is formed by seven municipalities, including LaSalle, Amherstburg, Essex, Kingsville, Leamington, Lakeshore and Tecumseh. The Windsor-Essex Region is located in the southwestern corner of Ontario and is part of a peninsula surrounded by water on three sides: Lake St. Clair located to the north, the Detroit River to the west and the Lake Erie to the south. The Municipality of Chatham-Kent is located to the east.

The Windsor-Essex Region has a strategic gateway location on the Canada/U.S. border. Its proximity to the Metro Detroit area and the location of important transportation infrastructure has allowed Windsor-Essex to be a central focus for NAFTA trans-border business activity. The area has an important concentration of research, innovation and advanced manufacturing for the automotive, aerospace, renewable and non-renewable energy and recreational products industries. In addition, its geographical location provides the area with milder winters and a long growing season. Consequently, Windsor-Essex has become one of Canada's most important agricultural areas including an important wine industry.

Figure 2-1 shows the geographic location of the City of Windsor within the North American context. Figure 2-2 shows the location of the Windsor International Airport within the context of the City of Windsor and the County of Essex.

FIGURE 2-1
City of Windsor Location

From a strategic market perspective, the Windsor-Essex Region is centrally located within an 8-hour drive from almost half of the North American population. Detroit's market accounts for an additional 4.5 million people within 65 kilometres of the Airport and about 25 million people can be reached within 400 kilometres. In addition, Windsor-Detroit is the busiest commercial land border crossing in North America – with approximately 3.5 million trucks crossing each year.

WINDSOR AIRPORT
MASTER PLAN

FIGURE 2-2 - LOCATION OF THE WINDSOR AIRPORT

WINDSOR AIRPORT
WATERBODY
HIGHWAY
LOCAL ROADS
SECONDARY ROADS

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by Alana Evers
Map checked by Karl Tanner

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Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

File Location: \\dillon.ca\DILLON_DFS\Oakville\V:\PROJECTS\DRAFT\2009\09-2665 Windsor Airport\09-2665 Graphics

There are two other major airports within the regional area - the London International Airport in London, Ontario, and the Detroit Metro Airport in Detroit, Michigan which are located approximately 170 km and 32 km respectively from the Windsor International Airport.

2.2 Population and Employment Forecast

This section provides a demographic profile of the Windsor-Essex Region.

Population influences the demand for air travel. As the Windsor-Essex Region grows, the demand for transportation will also increase. According to the 2008 *Windsor-Essex and City of Windsor Population and Housing Projections* Report completed in 2008 by Lapointe Consulting as part of the City of Windsor Official Plan Review, the Windsor-Essex Region had a population of 393,400 people in 2006 and a projected population of 491,821 persons by 2031. The Region is projected to grow by 98,426 persons in the 25-year projection period from 2006 to 2031. Table 2-1 shows projected population growth for Windsor-Essex.

Table 2-1 – Population Growth, Windsor-Essex, 2006-2031

Year	Population	5-Yr. Change	
		Change	% Change
2006	393,395		
2011	399,405	6,010	1.5%
2016	420,528	20,853	5.2%
2021	444,971	24,713	5.9%
2026	469,350	24,379	5.5%
2031	491,821	22,471	4.8%
20-Yr. Change 2006-2026		**75,955**	**19.3%**
25-Yr. Change 2006-2031		**98,426**	**25.0%**

Source: Lapointe Consulting, 2008

The City of Windsor had a population of 216,473 persons in 2006, with a projected population of 267,700 by 2031, an increase of 51,197 persons in the 25-year period. Average annual growth is expected to be low (0.33%) over the 2006 to 2011 period, but will subsequently increase to around 1% annually. These population projections were based on the 2006 census. Table 2-2 summarizes projected population for the City to 2031.

Regarding housing growth, the City is expected to achieve a total growth of 26,243 housing units by 2031, with an average annual growth rate of 1,040 units per year.

Table 2-2 – Population Growth, City of Windsor, 2006-2031, Reference Scenario

Year	Population	5-Yr. Change		Annual Growth Rate
		Change	% Change	
2006	216,473			
2011	220,037	3,564	1.6%	0.33%
2016	230,985	10,948	5.0%	0.98%
2021	243,055	12,070	5.2%	1.02%
2026	256,034	12,979	5.3%	1.05%
2031	267,670	11,636	4.5%	0.89%
20-Yr. Change 2006-2026				**39,561**
25-Yr. Change 2006-2031				**51,197**

Source: Lapointe Consulting, 2008

In terms of employment, EDP Consulting as part of the City's Official Plan Review estimated that the City of Windsor will be around 141,800 in 2026, an increase of 21,140 jobs from 2006 and 2026 (under the preferred Base Case Scenario). It is estimated that around 9,445 of the projected new jobs will locate on the employment lands in the Sandwich South Planning District which contains the Airport.

2.3 Activity and Outlook

The demand for air travel is largely influenced by the strength of the provincial, regional and local economy. Current and anticipated economic conditions, their impacts on labour force participation, and income all influence air travel, whether it is for business or personal purposes.

2.3.1 Provincial Economy

Ontario is home to approximately 13,069,182 (2009) people and is one of the fastest growing economies in Canada.

In 2009, the Ontario Real Gross Domestic Product (GDP) grew to $567,199 (million, nominal), averaging about 37.1% of Canada's GDP. The service industry has become the fastest growing component of Ontario's GDP as there is an ever growing shift from goods production (resource and manufacturing) to service based businesses.

The economic recession of 2008-10 has affected every world region in a unique way. Ontario will likely witness the following economic impacts:

- Increased unemployment in the manufacturing sector;
- Weakened trans-border exports due to dollar parity; and
- Increased taxes on select goods and services (HST; in effect July 1, 2010).

Each economic sector faces a unique set of opportunities and constraints. While the motor vehicle and parts industry slowly recovers in certain areas of the Province, the construction sector is seeing a substantial rise in activity. The Province is a strong supporter of providing financial stimuli to kick start the economy through investment in public infrastructure renewal. That includes new and upgraded roads, public transit, water and sanitary services and public buildings. As well, residential construction activity is picking up as the demand for housing increases.

2.3.2 Windsor-Essex Region Economy

Compared to the Provincial average, the Windsor-Essex Region is more slowly emerging out of the recession of 2008-10. As a major industrial centre in Southwestern Ontario, over 25% of the population works within the manufacturing sector.

The largest percent of the population in Essex County are employed in sales and service occupations (approximately one in ten), followed closely by trades, transport and equipment operators, and related occupations.

A year over year comparison of housing starts in Essex County showed positive growth for the months of January and February 2010. The spring and summer housing market looks positive as borrowing costs stabilize and the resale market tightens.

Various infrastructure projects are underway or planned in the Windsor-Essex Region. Highway 3, which runs northwest to southeast through the County of Essex, is currently being widened to four lanes to accommodate a more efficient and smoother flow of traffic. Of strategic importance to the Southern Ontario economy, planning is well underway for the third border crossing between Windsor and Detroit and the Windsor-Essex Parkway connecting link to Highway 401.

2.3.3 Windsor Economy

The City of Windsor is a focal point for goods movement into and within the Windsor-Essex Region. Approximately one third of all trade between Canada and the United States passes through the City of Windsor. It is estimated that 40% of all truck traffic between the two Countries passed through Windsor. In 2008, 5,224,139 metric tonnes of freight moved through the City[1].

The forecasted growth in real gross domestic product (GDP) for the City of Windsor in 2010 is 2.6%. According to EDP Consulting Employment

[1]Source: Windsor-Essex Development Commission – 2009 Community Profile: City of Windsor

Projections & Employment Lands Needs Analysis (2008), the City is currently undergoing substantial economic change as it adjusts to the global restructuring in the automotive manufacturing sector and related sectors. A decline occurred in the size of the employed labour force in 2007, due to closures and downsizing in the automotive manufacturing sector. In addition, the high Canadian dollar relative to the U.S. dollar also negatively impacted the manufacturing, retail and tourism sectors. The average size of the Windsor CMA labour force in 2007 was 156,200, slightly higher than the 2001 level, but around 5% lower than the 2006 level.

The City's economy is shifting from heavy manufacturing towards the service sector and more light and advanced manufacturing in a knowledge based economy.

Windsor is part of the Continental Gateway Initiative, which focuses on developing a sustainable, secure and efficient multi-modal transportation system, including roads, rail, ports, airports, inter-modal facilities and border crossings.

Opportunities exist for trans border business between Detroit/Windsor, the Windsor International Airport and the Sandwich South Planning District. With the Airport as the hub, the proposed employment lands in Sandwich South have the potential to become Ontario's primary western business gateway and a major logistics cluster for products entering Canada from the United States as well as cargo coming from or departing for Europe and Asia.

2.4 Transportation System

2.4.1 Air

The Windsor International Airport is served by four airlines providing scheduled and charter air services. Scheduled air services are available to the public, while charter operations generally serve tour wholesalers, private individuals and businesses. The Airport supports both jet and turbo-prop aircraft and can accommodate aircraft as large as a Boeing 747 and Antonov 225. Scheduled air services are provided by Air Canada Jazz and WestJet, while charter services are provided by Sunwing and Cameron Air.

Air Canada provides daily scheduled service to and from Toronto's Lester B. Pearson Airport using their affiliated regional service carrier Jazz. The aircraft used for these short-haul flights are Dash 8-100/300. Air Canada Jazz operates seven flights per day on weekdays and six flights on weekends between Windsor and Toronto, catering to both origin/destination passengers between the two Cities as well as connecting traffic.

WestJet has signed a three year commitment to serve Windsor. It launched seasonal scheduled service from Windsor to Calgary daily, between May 31, 2010 and October 30, 2010 using a Boeing 737-700 aircraft.

Sunwing operates a weekly non-stop charter flight from Windsor to Varadero and Havana, Cuba during the winter months (December to April) using a Boeing 737-800 aircraft.

Cameron Air provides charter flights to Pelee Island during the winter months. The air service utilizes a variety of single and multi-engine, turbo-prop aircrafts for the short-haul flights. Ferry and private boat transit take over the task of providing transportation to and from the Island during the spring, summer and fall months. However, private charter flights are still available for individuals.

2.4.2 Road

The Windsor International Airport is easily accessed from the major roadway network and transportation facilities, including the International border crossings (the bridge and tunnel), the Windsor Port, the VIA Rail station, the Windsor Transit Terminal, and Provincial Highways 401 and 3 (see Figure 2.3). The Province of Ontario, the City of Windsor and the County of Essex are in the planning, design and/or implementation stages of roadway improvements that will benefit the regional economy including the Airport.

The existing road network and related road improvements that have been confirmed and/or are proposed, position the Airport well to meet the transportation needs of future development.

Environmental assessment studies will confirm the preferred solutions for the planned and proposed roadway improvements, including the suitability of site access locations to the Airport lands. As well, there will be a need to complete site specific traffic impact studies to confirm roadway and access improvements necessary to accommodate site specific development proposals on the Airport lands.

The existing area road network as shown on Figure 2-3, is described in further detail below:

County Road 42

County Road 42 directly abuts the southerly limit of the Airport property and provides the primary access to the Airport. County Road 42 is under the jurisdiction of the City of Windsor. County Road 42 becomes Division Road, west of the CN Pelton Spur railway crossing.

The Essex-Windsor Regional Transportation Master Plan (October 2005) identified the need for the widening of County Road 42 to a four lane cross-section within a 5 to 10 year time frame.

Recently, the Ministry of Transportation, Ontario (MTO) announced their intention to complete an Environmental Assessment for improvements to County Road 42 and Lauzon Parkway, including an extension of Lauzon Parkway to Highway 401 and Highway 3, the construction of a new east-west arterial roadway south of County Road 42, and the completion of a Secondary Plan for the Sandwich South Planning District. A large portion of the Planning District is planned for employment land uses.

The results of these planning and preliminary design studies will confirm the preferred roadway improvements, as well as access locations and corridor control provisions that are required to accommodate development of the Airport lands.

At this time, it is expected that no direct access for development of individual sites would be provided along County Road 42. Individual site access could be accommodated from an internal road network, with intersection locations along County Road 42, as generally shown on Figure 8-1.

Lauzon Parkway

Lauzon Parkway is an arterial road under the jurisdiction of the City of Windsor. It currently extends from County Road 42 northerly, and includes a full access interchange at the E C Row Expressway.

The Essex-Windsor Regional Transportation Master Plan (October 2005) identified the need for the widening of Lauzon Parkway to a four lane cross-section from E.C. Row Expressway to County Road 42 within a 5 to 10 year time frame. Furthermore, it was recommended that Lauzon Parkway be extended to Highway 401 and Highway 3 within a 5 to 10 year timeframe.

As noted earlier, the proposed Environmental Assessment being initiated by MTO will confirm the preferred roadway improvements, as well as opportunities for access from the Airport lands to Lauzon Parkway. The extension of Lauzon Parkway to Highway 401 and the broader Provincial Highway network is expected to stimulate future development opportunities at the Airport.

It is recommended that future access to Lauzon Parkway be provided to support the transportation needs of future development on the Airport lands.

E.C. Row Expressway

E.C. Row Expressway is a controlled access highway under the jurisdiction of the City of Windsor. Interchanges in close proximity to the Airport exist at Walker Road, Central Avenue, Jefferson Boulevard and at Lauzon Parkway.

The Essex-Windsor Regional Transportation Master Plan (October 2005) identified the need for the widening of the E.C. Row Expressway to six lanes from Huron Church Road to Banwell Road within a 10 to 20 year time frame.

Based on capacity limitations at the Central Avenue interchange, as well as property limitations and railway conflicts at the Jefferson Boulevard interchange, improved access from the Airport lands to the E.C. Row Expressway could be facilitated by providing the following roadway connections:

- New access to Lauzon Parkway;

- New access to Wheelton and Pillette near Walker Road; and
- Improved secure/controlled access to Jefferson Boulevard for limited use, as required to eliminate through-traffic use across the Airport lands.

Walker Road

Walker Road is a local arterial road under the jurisdiction of the City of Windsor. Walker Road provides access to Highway 401, Highway 3 and the E.C. Row Expressway. It was recently improved from Division Road to Highway 3. Based on recent funding announcements, it is expected that Walker Road will soon be improved from Division Road to north of the E.C. Row Expressway.

Walker Road connects to Highway 3 and southern Essex County.

Jefferson Boulevard

Jefferson Boulevard is a local collector road under the jurisdiction of the City of Windsor. Due to property limitations, including the location of the CP Railway corridor, a partial interchange exists at E.C. Row Expressway and Jefferson Boulevard. There are limited opportunities to further improve this interchange, thereby restricting opportunities to utilize this location to access Airport lands.

At this time, it is suggested that a secure/controlled access to Jefferson Boulevard be provided from the Airport lands, as outlined above.

Local Roads

Wheelton Road, Foster Avenue, Pillette Road, and Airport Road serve as available local roadway connections directly to the Airport lands. These roads are under the jurisdiction of the City and provide opportunities for access.

Connection to these roads will require further traffic impact studies to confirm the suitability for access and any associated roadway improvements required to accommodate the development needs.

Highway 401

As previously noted, Highway 401 is a controlled access provincial highway under the jurisdiction of the MTO. Access to Highway 401 from the Airport is currently via Walker Road to Division Road/County Road 42. In recent years, the MTO has widened and improved Highway 401 from Tilbury to Windsor.

Within the next three to five years, the Windsor-Essex Parkway and the proposed additional international crossing is expected to be implemented as a significant improvement to the Windsor-Detroit border crossing route, a major trade corridor between Canada and the U.S.

2.4.3 Rail

The Windsor Airport property directly abuts the existing Canadian Pacific (CP) Railway's Windsor Subdivision at the northeast corner of the property (see Figure 2.3). The CP Rail Windsor Subdivision has direct access to CP's international rail tunnel for rail cargo traffic. In recent years, road-rail grade separations have been completed along this rail corridor at Walker Road, Howard Avenue (currently underway) and at Tecumseh Road West.

CP is currently in the process of completing a federal Environmental Assessment study to implement the new Continental Rail Gateway, a rail tunnel under the Detroit River. The tunnel which currently handles double-stacked rail cars would be enlarged, further enhancing the significance of this rail corridor.

The Windsor Airport property also directly abuts the existing Canadian National (CN) Railway's Pelton Spur line along the west property line of the Airport lands. The Pelton Spur provides a rail link between CP and CN rail lines, including the Essex Terminal Railway further to the north.

2.4.4 Water

The Port of Windsor provides for a connection to sea and Great Lakes faring ships (see Figure 2.3). The Port is the third largest port on the Great Lakes in terms of volume. It contains inter-modal facilities and marine fuel facilities including the recently announced Sterling Fuels facility. Access between the Airport and

the Port of Windsor is currently possible by road via the E.C. Row Expressway and Huron Church Road.

The upcoming implementation of the Windsor-Essex Parkway will further facilitate this access.

Access between the Airport and the Port of Windsor could also be accomplished via rail corridors, utilizing the Essex Terminal Railway and connections to CN and CP rail lines. Improvements to rail facilities in proximity to the Airport, including an extension of rail lines into the Airport lands is required to accommodate this mode of transport.

2.4.5 Multi-modal Opportunities

Windsor's strategic gateway location raises opportunities for cross-border, multi-modal business between Detroit/Windsor, the Windsor International Airport and the Sandwich South Planning District. The City of Windsor is a focal point for traffic flows into Canada from the Detroit/Chicago corridor. Windsor is part of the Continental Gateway Initiative, which focuses on developing a sustainable, secure and efficient multi-modal transportation system, including roads, rail, ports, airports, inter-modal facilities and border crossings.

The Sandwich South planning area is strategically located for the potential development of a multi-modal hub linking the Windsor Airport; Highway 401, CP Rail and Canadian National Railway, the Ambassador Bridge, Detroit-Windsor Tunnel, the Detroit-Windsor Truck Ferry, the Windsor Port, the Lauzon Parkway extension and the 3rd International Crossing and Windsor-Essex Parkway. The employment lands in Sandwich South with the Airport lands at its centre have the potential to become Ontario's primary western business gateway and a major multi-modal hub and logistics cluster for products entering Canada from the United States.

The Community Based Strategic Rail Study, April 2008 (updated August 2008) confirmed the ability to physically accommodate a rail facility on Airport lands. The Master Plan should protect the flexibility to accommodate a future rail-truck multi-modal facility in the northeast corner of the Airport lands.

2.5 Municipal Planning Context

2.5.1 Sandwich South Planning District

The Windsor International Airport is located within the Sandwich South Planning District. The Planning District covers 2,530 hectares and is situated at the eastern limits of Windsor. This area was annexed into the City of Windsor in 2003. Official Plan Amendment (OPA #60), adopted by Council in 2007, incorporated these lands into the City of Windsor Official Plan.

The Sandwich South lands are needed by the City of Windsor to accommodate future population and employment growth, as noted in the Land Supply Report prepared by Dillon Consulting Limited.

Currently, the Sandwich South Lands, south and east of the Airport, are primarily used for agricultural purposes. This area represents a large supply of potentially serviced vacant lands in large holdings suitable for new residential and employment land uses, including industrial uses that require larger blocks of lands. Servicing is being extended into the Sandwich South area, as part of the Federal stimulus package (Canada's Economic Action Plan).

OPA #60 designated a variety of uses for the Sandwich South lands, with three main land uses accounting for most of the area: Future Urban Area, Future Employment Area and Airport. Other planned land uses in the area are Business Park, Industrial, Residential, Mixed Use, Open Space and Natural Heritage.

A large area towards the centre of Sandwich South is designated as "Future Urban Area". Areas south of the Airport boundary adjacent to Highway 401 are designated as "Future Employment Area". The "Airport" designation is approximately 431 hectares, and includes active Airport uses. The remainder of the Airport lands are designated Future Employment Area and Natural Heritage. Areas adjacent to the Airport, south of County Road 42 at the northeast corner of the Sandwich South Lands are designated "Business Park". Areas to the extreme east, adjacent to Banwell Road are designated "Mixed Use". A small area on Baseline Road, east of 8th Concession Road is designated "Residential". Figure 2-4 shows the land use designations in OPA #60.

OPA #60 defined "Future Urban Area" and "Future Employment Area" as unserviced areas expected to be developed within 20 years. "Future Urban Areas" are generally to be developed for residential uses, but will also include associated community supportive uses, such as parks and open space, institutional, commercial and small-scale employment. "Future Employment Areas" are intended to accommodate future Industrial and Business Park designations.

OPA #60 requires that secondary planning be carried out to delineate in more detail the specific configuration of various land uses, road systems and servicing infrastructure prior to proceeding with development in the Future Urban Area and Future Employment Area.

A subsequent amendment to the Official Plan Amendment (OPA #74) for the lands in the East Pelton Secondary Plan Area was adopted by City Council in 2009. Initiated by private property owners, the amendment provides for the development of the new Southwest Detention Facility by the Ontario Realty Corporation.

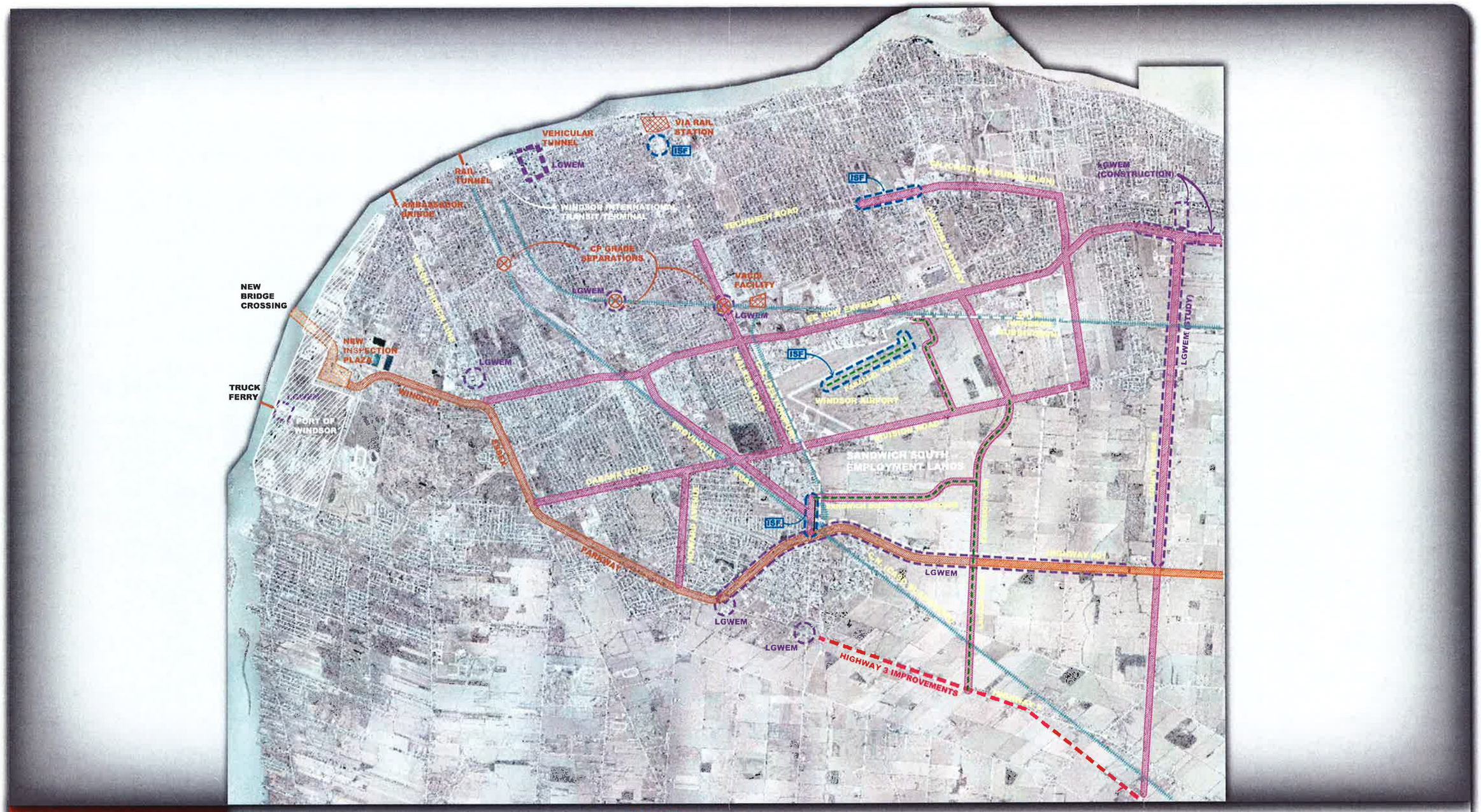
The East Pelton area is located in the southwestern portion of the Sandwich South Planning District and covers approximately 206 hectares. The area is bounded generally by 7th Concession Road to the west, 8th Concession Road to the east, Highway 401 to the south and lands south of Baseline Road. The Secondary Plan redesignated the lands located in the southern part of the planning area from "Future Urban Area" to "Mixed Uses", "Major Institutional", "Commercial Centre", "Minor Institutional" and "Private Recreation". The balance of the East Pelton Planning Area remained as "Future Urban Area".

Pressure to redesignate the rest of the "Future Urban Area" and "Future Employment Area" within the Sandwich South area will likely occur in the short to medium-term, particularly since infrastructure services have been extended to the area. According to the Land Needs Study prepared by Dillon Consulting Limited as part of the Official Plan Review, the City of Windsor requires 333 gross hectares of residential land supply to meet projected 20 year housing demands. A significant portion of the Sandwich South lands will need to be redesignated from Future Urban Area to residential land uses to satisfy the projected housing demand.

With respect to the City's employment lands needs, it is estimated that about 9,445 new jobs will be located on Business Park / industrial employment lands between 2007 and 2026 (EDP Consulting, 2008). Approximately 500 to 625 gross hectares of employment lands are needed to accommodate projected needs by 2026. The Land Supply Study indicated that the City has a shortfall of approximately 375-500 gross hectares of designated employment lands. Sandwich South has about 1,036 gross hectares of Future Employment Lands, which can accommodate the City's employment needs for the next 20 years.

Over 250 hectares of land on the Airport property are designated "Future Employment Area" in Sandwich South. These lands are located east of the operating Airport area and are being planned as a Business Park to accommodate non-Airport related employment uses. These uses will benefit from close proximity and connections to the Airport. These lands require an Official Plan Amendment to redesignate them from "Future Employment Area" to a Business Park type designation to accommodate development. It is recommended that these lands be redesignated for employment uses.

Land is available on the Airport property for a wide range of employment land uses – both Airport related and non-Airport related. Potential synergies could be developed between employment uses on the Airport and local industry (manufacturing, warehousing, etc.). This will further increase and diversify Airport revenues, as well as attract businesses to the Sandwich South Planning District.



WINDSOR AIRPORT MASTER PLAN

FIGURE 2-3 - EXISTING EXTERNAL TRANSPORTATION

PLANNED AND RECENTLY IMPLEMENTED TRANSPORTATION IMPROVEMENTS

WINDSOR BIIG (BORDER INITIATIVES IMPLEMENTATION GROUP)
- LET'S GET WINDSOR-ESSEX MOVING (LGWEM)
- DRIC

INFRASTRUCTURE STIMULUS FUND (ISF) ROADWAY PROJECTS

PROPOSED TRANSPORTATION IMPROVEMENTS ARISING FROM:
- E-W RTMP (2005)
- WALTS (1999)
- SANDWICH SOUTH PLANNING STUDY

Notes:
1. Conceptual Layout
2. All dimensions approximate

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by DAM
Map checked by PMM/FRF

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

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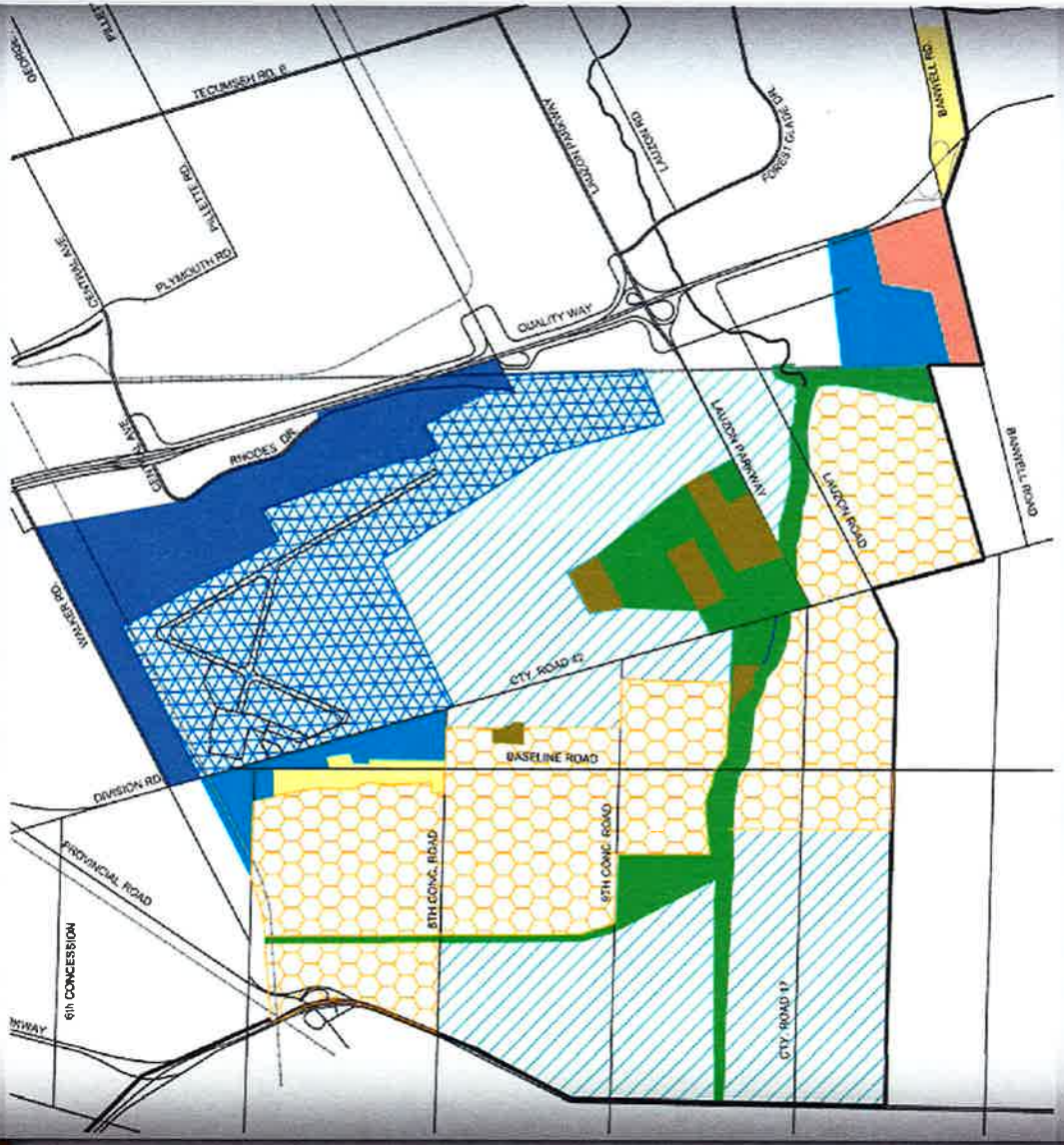

WINDSOR AIRPORT MASTER PLAN

FIGURE 2-4 - SANDWICH SOUTH DISTRICT: OFFICIAL PLAN DESIGNATIONS

- RESIDENTIAL
- MIXED USE
- FUTURE URBAN AREA
- OPEN SPACE
- NATURAL HERITAGE
- FUTURE EMPLOYMENT AREA
- BUSINESS PARK
- INDUSTRIAL
- AIRPORT

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by Paddy Kennedy
Map checked by Karl Tanner

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/a
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Status: n/a
Date: December 2010

N E S W

2.5.2 City of Windsor

The Airport has an important role in the economic development of the City of Windsor. As such, the City's Official Plan mandates that "Council shall maximize the economic development potential provided by the Windsor International Airport by promoting the development of employment land uses, including multi-modal facilities, in the vicinity of the Airport". In addition, the City shall protect the Airport from incompatible development.

The City of Windsor Official Plan designates the lands around the Airport for various employment type uses. The areas west of the Airport are designated "Industrial, the areas along Walker Road are "Commercial Corridor" and the areas north of the Airport, along the E.C. Row Expressway, are designated "Industrial" and "Business Park".

2.5.3 Essex County

In terms of planned land uses, lands located to the east and south of the Sandwich South Planning District in Essex County are designated as "Agricultural Areas" in the County Official Plan. Lands south of the Highway 401, east of 9th Concession, are designated as "Settlement Areas".

At the local municipal level, the areas to the east and south of the Sandwich South Planning District are designated as "Agricultural Area" in the Town of Tecumseh Official Plan (formerly Township of Sandwich South), and the lands south of Highway 401 and east of 9th Concession are designated as "Business Park".

2.5.4 Windsor-Detroit

A new border crossing and connecting link to Highway 401 (the Windsor-Essex Parkway) are being proposed by the Border Transportation Partnership, which represents the Government of Canada (Transport Canada), the Province of Ontario (Ministry of Transportation), the United States (Federal Highway Administration) and Michigan (Michigan Department of Transportation).

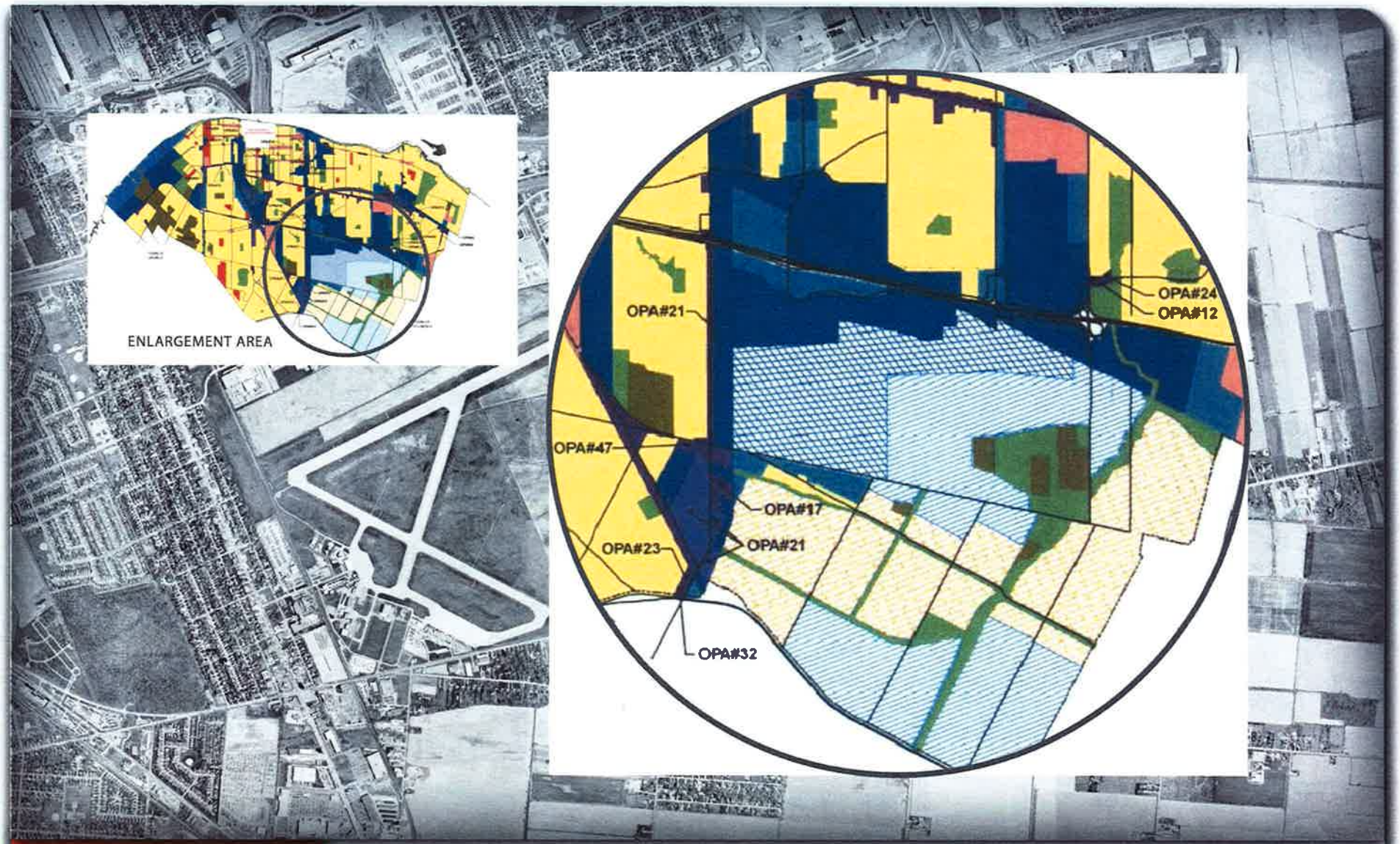
The Windsor-Detroit corridor is highly significant to the economies of Canada and the U.S. Approximately one third of Canada-U.S. surface trade passes through Windsor-Detroit and over 80% of all goods crossing the Detroit River are carried by truck. The current border crossings (Ambassador Bridge and Detroit-Windsor Tunnel) and associated connections are nearing capacity. Due to the significance of this border crossing to the national, provincial/state and local economies, both countries are taking the necessary steps to provide for the continuous flow of people, goods and services.

The Windsor-Essex Parkway will provide an access road to a new Canadian inspection plaza and river crossing in west Windsor. It will provide a direct route connecting Highway 401 in Windsor to Interstate 75 in Detroit. This project will be one of the most significant highway investments made in Ontario, with an estimated cost of $1.6 billion. The Parkway will be a below-grade, six lane freeway with eleven tunnels and service roads. It will improve community linkages and provide extensive new trails, green space and other recreational areas.

Implementation of the Parkway, and the new plaza and crossing, will have a positive impact on the local, regional, provincial and national economies by facilitating the efficient and safe movement of goods, people and services between the two countries. This third international crossing will provide both Canada and the U.S. with more reliability in their cross-border transportation system and reduce the likelihood of disruption to transportation service in the corridor. This project will also create a significant amount of employment during the construction period (approximately 12,000 project-related jobs), thus helping to energize economies on both sides of the border.

The proposed Windsor-Essex Parkway and the Detroit River International Crossing are key elements for the improvement of the cross-border transportation system between the cities of Windsor and Detroit. This project will also bring new opportunities for growth to the Airport and Sandwich South Planning District.

Figure 2-5 illustrates land use in the vicinity of the Airport.



WINDSOR AIRPORT
MASTER PLAN

FIGURE 2-5 - LAND USE IN AIRPORT VICINITY

RESIDENTIAL	MAJOR INSTITUTIONAL	WATERFRONT RECREATION	FUTURE EMPLOYMENT AREA	MIXED USE
OPEN SPACE	FUTURE URBAN AREA	WATERFRONT PORT	NATURAL HERITAGE	INDUSTRIAL
BUSINESS PARK	WATERFRONT RESIDENTIAL	COMMERCIAL CENTRE	COMMERICAL CORRIDOR	AIRPORT

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by Alana Evers
Map checked by Karl Tanner

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

File Location: \\dillon.ca\DILLON_DFS\Oakville\V:\PROJECTS\DRAFT\2009\09-2665 Windsor Airport\09-2665 Graphics

2.6 Community Concerns

2.6.1 Airport Physical Development

Extensive stakeholder consultations were held during the preparation of the Windsor International Airport Master Plan. Stakeholder consultations included, but were not limited to, Airport tenants, private businesses and management, and staff at the City of Windsor. Consultations with Airport stakeholders indicated certain concerns with Windsor International Airport. Some individuals expressed concerns about the current age of the air terminal building; however, they also indicated that the current facility supports current passenger volumes. If air passenger traffic were to increase substantially, the air terminal's capability to process passengers may be affected. Further discussion of the Air Terminal Building is included in Chapter 5.

2.6.2 Aviation Related Businesses

Consultations with stakeholders of Airport related businesses revealed several concerns regarding the Airport. A commonly shared concern, with implications for all Airport related development, is limited traffic volume to and from the Windsor International Airport. The low traffic flow may impact future business for current and prospective tenants. Other issues expressed by stakeholders include:

- an increased need for more hangars, infrastructure and services;
- passenger congestion in the Air Terminal Building during peak hours;
- the need for additional maintenance facilities and equipment; and
- increased aircraft noise if the Airport is expanded.

2.6.3 Non-Aviation Related Businesses

Non-aviation development issues expressed by stakeholders included concerns regarding permit approvals from the City of Windsor, as well as the perceived high taxes currently being paid for operating on Airport property. Another issue associated with building and operating on Airport property, is the perceived unequal determination of market value for each structure. Stakeholders suggest that a fair market value is necessary to help foster new building land leases and construction activity. It is noted that MPAC is responsible for the market value assessments.

3 Airport Profile

3.1 Role and Designation

3.1.1 Role

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

The Windsor International Airport is certified in accordance with the requirements of Transport Canada Document TP312E – Aerodrome Standards and Recommended Practices. The Airport Certificate acknowledges that the Airport meets all regulatory and operational requirements of the Canadian Aviation Regulations (CARs), and enables the Airport to accept scheduled air services.

The Airport serves the needs of scheduled and charter air operators, general aviation users, and low volume cargo operations. In order to maximize the economic capabilities of the Airport, the role of the Windsor International Airport should be to provide:

- a point of service for local, regional and international air services;
- infrastructure to support air cargo and multi-modal freight operations;
- infrastructure to support an inter-modal cargo transfer facility;
- a business hub and tourist gateway to the Windsor-Essex region;
- a base for corporate and private aircraft owners and operators;
- infrastructure to support national and international aerospace manufacturing, aircraft overhaul and maintenance;
- a base for general aviation activities and support;
- a base for flying training activities; and
- utilization of Airport owned lands that are surplus to the long-term needs of the Airport to provide for an emerging Business Park, green economy and transportation related uses in the Sandwich South planning district.

3.1.2 Designation

The Windsor International Airport is owned by the City of Windsor and operated by Your Quick Gateway (Windsor) Inc., a wholly owned Federal share corporation of the City of Windsor under a long-term management agreement. It is not classified under Transport Canada's National Airports System.

3.2 History

The Airport has an extensive history dating back to 1920 when the Border Cities Aero Club was formed by local aviation enthusiasts. Inspired by Charles Lindbergh, local flyers attempted an aerial journey from the current Airport site, at that time a grass field, to Windsor, England. Although this flight was affected by inclement weather, the idea of establishing an Airport persisted within three local organizations: the Border Cities Aero Club, the Aviation Committee of the Chamber of Commerce and the Aerial League. The Airport was officially opened as Walker Field on September 8, 1928, with a large air show, including an international air race to Los Angeles.

In 1929, the site was declared a customs point of entry to Canada and the 113 hectare site was named Walker Airport. The Airport lands were donated by the Walker Family through a 5 year, no fee lease agreement. In 1931, the Airport was used by Canadian Airways on daily airmail routes which continued until 1932.

In 1934, the Aero Club advised the Department of Transportation's Civil Aviation Branch that they would

have to vacate the Airport lands as Walker Farms wanted the lands back due to financial difficulties during the depression. At this time, a large portion of the Airport lands were given back to the Walker family. The remaining portion of the site was licensed as an Airport on June 12, 1936.

The federal Department of Transport (DOT) and the local Chamber of Commerce continued discussions on Airport development in 1937 and the DOT agreed to build an Airport on a site to be provided by the City of Windsor. Following the rejection of a location on Huron Church Line, the Walker site was selected.

The DOT agreed to operate the Airport until December 31, 1941, at which point the City would take over.

In 1939, Walker Field was re-licensed in the name of the Border Cities Aero Club and the DOT submitted two proposals for Airport development. It asked for an early decision so Trans-Canada Airways (TCA) services could be extended to Windsor.

In 1940, the Department of National Defence located a flying school at the Walker site under the British Commonwealth Air Training Plan (BCATP) for World War II. Following this decision, 3 runways were constructed measuring 1,143m (3,750'), 1,037m (3,400'), and 915m (3,000') in length. All three runways were 60m (200') in width. An administration building and control tower were also constructed. Trans Canada Airways officially began operations on August 1, 1940, and the Airport was officially opened by Minister C.D. Howe in October of 1940.

Following World War II, the Royal Canadian Air Force buildings were transferred to the DOT after flying training ceased under the BCATP. In 1948, two runways were extended to 1,600m (5,250') and 1,585m (5,200') to permit operation of TCA's North Star (DC-4) Vickers aircraft. Runway 07-25 was further extended to 2,104m (6,900') in 1954 to accommodate TCA's Viscount Aircraft fleet.

In 1950, the City of Windsor informed the DOT that it did not intend to exercise the option to take over the Airport and ownership was transferred to the DOT. A new air terminal building was completed in 1958, similar to designs at the Saskatoon and Quebec City Airports. Many war surplus buildings were removed during this period of time.

In the early 1960's, TCA began utilizing larger Vickers Vanguard aircraft to serve the Windsor Airport and Canadian Pacific Airlines even offered DC-8 services to Mexico City. This air service continued until 1970.

Runway 07-25 was extended to 2,409m (7,900') in 1969 to accommodate Air Canada's DC-9 aircraft and the air terminal building was expanded in 1976-77 to meet growing passenger demand.

During the recession from 1983 to 1985, the Airport went through extensive improvements as a result of the Federal Government's Special Recovery Capital Projects Program. Several infrastructure improvements were made including a fire hall addition, resurfacing for Runways 07-25, Foxtrot, and all taxiways, aprons, and car parks. Water and electrical distribution upgrades were also conducted during this time, along with the replacement of high intensity approach and runway edge lighting systems.

The Windsor International Airport was served by several air carriers between 1985 and 1992, including Air Canada, South West Air, Skycraft Aviation, Air Ontario, Ontario Express, Sims Air and Windsor Helicopters.

In 1998, the ownership of the Airport was transferred from Transport Canada to the City of Windsor.

At the time of transfer, the Windsor Airport property included a significant area of land not currently needed for Airport operations. The proceeds from the sale of lands revert to the Airport.

On January 1, 1999, Airport operations were contracted by the City of Windsor to Serco Aviation Services Ltd. Serco operated the Airport until 2007 when its contract was terminated and the City re-acquired control of the Airport and formed YQG to operate the Airport. The City is the sole shareholder of the corporation.

3.3 Current Infrastructure

Windsor International Airport includes two runways, seven taxiways, and two public aprons. The core development area is located in the southwest quadrant of the Airport property. The Airport is illustrated in Figure 3-1.

Airport information has been derived from various aeronautical references, including the Airport Operations Manual (AOM), Canada Flight Supplement (CFS), and the Canada Air Pilot (CAP). Table 3-1 shows key data specific to the Windsor International Airport. This data is generally used for aviation operations and Airport planning purposes.

Table 3-1 – Aerodrome Data

Reference Point (coordinates)	N 42° 16' 32" W 82° 57' 20"
Reference Point Elevation	189.6m ASL
Aerodrome Elevation	189.6m ASL
Aerodrome Magnetic Variation	7°W

3.3.1 Runways

The layout of an Airport's runways impacts the growth and development potential of the Airport, both with respect to their capability and dimensions and protective zoning areas (also known as obstacle limitation surfaces) required around the runway system, as described in the following sections.

Runway 07-25

Windsor's primary runway 07-25 is 2,743m x 61m (9,000 ft x 200 ft). The runway has a paved asphalt surface and is considered a Code 4E (P) Precision facility by Transport Canada. The runway includes a graded area width of approximately 180m (600 ft) which provides a flat, obstacle free area in the event of an aeroplane running off the runway. The runway strip associated with Runway 07-25 is 300m (984 ft) in width, (150m on either side of the runway centreline) and extends 60m beyond the runway thresholds. Fixed objects are not permitted within the runway strip, except frangible visual aids required for air navigation purposes.

Runway 25 has a displaced threshold of 348m (1,143 ft) while Runway 07 has a displaced threshold of 275m (902 ft). Declared distances used for aircraft runway performance calculations are shown in Table 3-2.

Table 3-2 – Runway 07-25 Declared Distances

Declared Distances	07	25
Take-Off Run Available (TORA)	9,000 ft	9,000 ft
Take-Off Distance Available (TODA)	9,984 ft	9,330 ft
Accelerate Stop Distance Available (ASDA)	9,000 ft	9,000 ft
Landing Distance Available (LDA)	8,098 ft	7,857 ft

Runway 12-30

Windsor's secondary runway - Runway 12-30 measures 1,570m (5,150 ft) in length with a declared width of 46m (150 ft). This runway also has a paved asphalt surface and is considered a Code 3D (NP) Non-Precision facility by Transport Canada. Declared distances for Runway 12-30 are shown in Table 3-3.

Table 3-3 – Runway 12-30 Declared Distances

Declared Distances	RWY 12	RWY 30
Take-Off Run Available (TORA)	5,150 ft	5,150 ft
Take-Off Distance Available (TODA)	5,445 ft	5,445 ft
Accelerate Stop Distance Available (ASDA)	5,150 ft	5,150 ft
Landing Distance Available (LDA)	4,580 ft	4,829 ft

Obstacle Limitation Surfaces (OLS) are established for Runways 07-25 and 12-30, as shown in Table 3-4. These limit development and land use in the vicinity of the runway, and outside the Airport property boundary.

Table 3-4 – OLS Runway 07-25 and 12-30

Description	07-25	12-30
Approach Surface		
Length of Inner Edge	300m	150m
Distance from Threshold	07 – 0m 25 – 60m	60m
Divergence	15%	15%
Length	15,000m	3,000m
Slope	2% (1:50)	2.5% (1:40)
Transitional Surface Slope: 14.3% (1:7)		
Outer Surface		
Elevation	189.6m	189.6m
Dimensions	2,743m	1,570m

3.3.2 Taxiways

Several taxiways connect the Airport's core development area to both runways. Taxiway 'A' connects Apron I to Runway 12-30 and is classified as a Code E facility. Taxiway 'A' is 30m wide.

Taxiway 'D' connects Apron III to the threshold of Runway 30, measures 23m in width, and is also classified as a Code E facility.

Taxiway 'E' is an uncontrolled taxiway originating at Taxiway 'G' and connects to several commercial development areas. Taxiway 'E' measures 10.5m in width and is classified as a Code B pavement surface.

Taxiway 'F' connects the mid points of Runways 07-25 and Runway 12-30 from Taxiway 'G' and the public apron areas. This taxiway is classified as a Code E facility with a pavement width of 23m.

Taxiway 'G' runs parallel to Runway 12-30 and connects Aprons I and II. The portion of Taxiway 'G' to the east of Taxiway 'F' measures 23m in width, while west of Taxiway 'F', the pavement surface measures 30m in width. Taxiway 'G' is classified as a Code E facility.

Taxiway 'H' was constructed in 2010 as a 23m wide asphalt paved facility that is located parallel to runway 07-25. Taxiway 'H' is a Code E facility from the threshold of Runway 25 to taxiway 'F'.

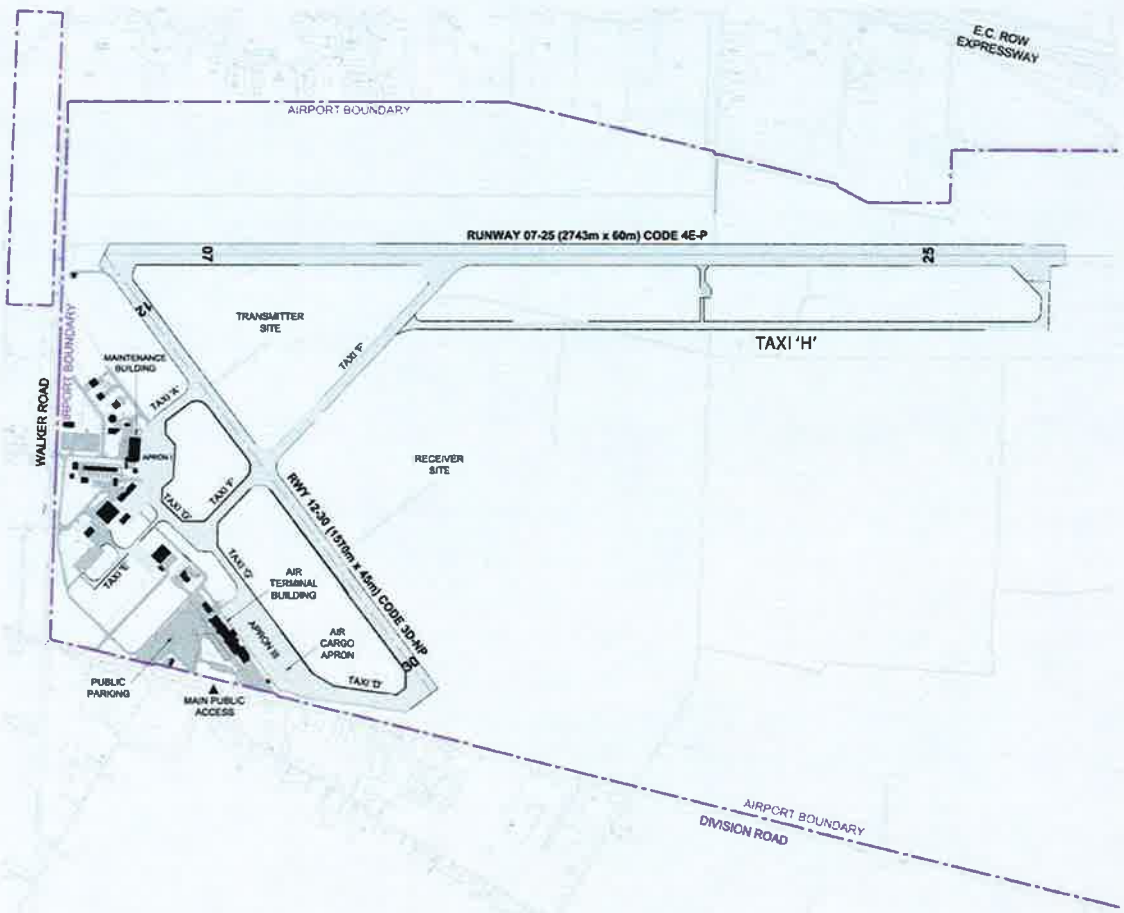
Taxiway 'I' was also constructed in 2010 as a 10.5m wide asphalt paved facility, located at the midpoint between the threshold of runway 25 and taxiway 'F', intersecting with taxiway 'H'. Taxiway 'I' is a Code B facility. Taxiway 'I' replaces the Holdbay near the mid-point of Runway 07-25.

3.3.3 Aprons

The Airport currently operates two public aprons. Apron I has an area of 20,805m^2 and is primarily used for itinerant aircraft operations, including low volume cargo services. Apron I is comprised of a paved asphalt surface with a Pavement Load Rating (PLR) of 10. Based on the size and strength of Apron I, a representative aircraft can be accommodated on Apron I, which can include, but is not limited to Boeing 737-800, Airbus 320-200, and business aircrafts, such as the Bombardier Global Express, Gulfstream V, and various other commuter and general aviation types.

Apron III is considered the Airport's primary passenger apron. This apron is situated adjacent to the Air Terminal Building (ATB) and Nav Canada's Air Traffic Control (ATC) tower. Unlike Apron I, Apron III is rigid concrete with a PLR of 10. Pavement markings for an aircraft stand taxi lane, a vehicle corridor, and several aircraft stands are provided. Apron III has sufficient capacity for several aircraft, depending on size and placement.

Several small aprons are situated within the Airport's core development area. These aprons are classified as private and used by Airport tenants for business and recreational flying purposes.



WINDSOR AIRPORT MASTER PLAN

FIGURE 3-1 - SITE PLAN

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by Alana Evers
Map checked by Karl Tanner

N W E S

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

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3.3.4 Air Navigation Facilities

Air navigation facilities generally provide increased Airport reliability and availability, especially during periods of darkness, low visibility, and low cloud ceiling heights. Protective areas of varying degrees are required around each air navigation facility, depending on the equipment. Future developments must consider these protective requirements. The air navigation systems currently in operation at the Windsor International Airport are described in this section.

Non-Directional Beacon

A non-directional beacon (NDB) located approximately 3.8 Nautical Miles (NM) prior to the threshold supports a non-precision instrument approach to Runway 25. This navigational aid can be used by aircraft operators in isolation, or in combination with an Instrument Landing system when a precision approach is preferred.

The non-precision NDB approach offers a minimum descent altitude of 392 feet Above Ground Level (AGL), and visibility limits of greater than one statute mile.

RNAV/GPS

Non-precision instrument approach capability is also provided for Runway 07 using an RNAV Approach. An RNAV approach (which uses GPS satellites to aid navigation) allows an approaching aircraft to descend to a minimum descent altitude of 399 feet AGL, and has a standard visibility requirement of 1 ¼ statute miles.

VOR/DME

Runway 30 is provided with a published non-precision approach. Non-precision approaches can be executed on Runway 30 by utilizing the YQG VHF Omnidirectional Range (VOR), and its co-located Distance Measuring Equipment (DME). This installation is located approximately 3.6 NM prior to the threshold of Runway 30. The VOR/DME non-precision approach provides a minimum descent altitude of 379 feet AGL and visibility requirement of at least 1 ¼ statute miles.

Instrument Landing System

Windsor International Airport is equipped with an Instrument Landing System (ILS) supporting precision approaches to Runway 25. The ILS consists of a localizer antenna providing horizontal guidance to aircraft and a glide path antenna providing vertical guidance. The precision approach supporting Runway 25 provides a minimum descent altitude of 200 feet AGL, and can be utilized when the local visibility is greater than ½ statute miles, or the Runway Visual Range (RVR) is greater than 2,600 feet.

Visual Aids

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

- Aerodrome Beacon;
- Aircraft Radio Control Aerodrome Lighting – Type K (ARCAL);
- Lighted Wind Direction Indicators (5);
- High-Intensity Simplified Short Approach Lighting (SSLAR) (Rwy 25);
- Low-Intensity Centre Row Approach Lighting (Runways 07 and 12);
- Precision Approach Path Indicators (PAPIs) – P2 Type (All Runways);
- High-Intensity Runway Edge Lighting (Rwy 07-25);
- Medium-Intensity Runway Edge Lighting (Rwy 12-30);
- Runway Identification Lights (Rwy 07); and
- Guard Lighting for Low Visibility.

3.3.5 Aviation Service Facilities

Air Traffic Control

The Windsor International Airport is equipped with an Air Traffic Control (ATC) tower operated by Nav Canada. The ATC tower issues instructions and clearances to aircraft operating on the Airport, and within the designated Class D control zone extending 6NM from the Airport in all directions.

Air Traffic Control services are provided to operating aircraft within the normal operating hours of 0630 – 2230 local time via both 'Ground' and 'Tower' radio frequencies.

Flight Services

The Windsor International Airport is not equipped with a Flight Service Station (FSS), as the Airport is provided with ATC services. Pre-flight and in-flight information services, such as pilot weather briefings, meteorological and aeronautical information, aeronautical broadcasts, flight planning and visual flight rules (VFR) alerting, and other pre and en-route associated services are provided by Windsor ATC.

Pilots operating at or near the Windsor International Airport can also request flight planning information via a Remote Communications Outlet (RCO) connected to London Flight Services. Both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) flight planning services are provided by the FSS. The London Flight Services station can also be contacted by landline at 1-866-992-7433.

Aviation Weather

An Automatic Weather Observation System (AWOS) has been installed at the Airport. However, as of January 2010, the system had not yet been commissioned.

An operational weather observation site is located south of the Air Terminal Building and provides local weather information to Environment Canada and Nav Canada. This site measures standard meteorological data, such as temperature, wind direction, barometric pressure, ceiling height, precipitation and other data.

Flight crews can obtain weather information through contacting the FSS in London. Local ATC staff provide meteorological aviation reports (METARs) as well as Terminal Area Forecasts (TAF).

Aviation Communications

Aviation communications are available using several aviation radio frequencies. An Automatic Terminal Information Service (ATIS) is provided at the Windsor International Airport.

The ATIS is a continuous broadcast, updated on a regular basis (usually hourly during normal hours of operation), conveying information related to active runways, altimeter settings, available approaches, notice to airmen (NOTAM) and other operational information pertinent to aircraft operations. The Windsor International Airport ATIS is available on 134.5 MHz.

A 'Ground' frequency is also operational at the Windsor International Airport. Pilots are required to communicate with ATC via this frequency when receiving IFR clearances, and taxiing to and from the active runways. The 'Ground' frequency is available on 121.7 MHz.

A 'Tower' frequency is provided and designated for pilots operating on active runways, and within the Class D airspace surrounding the Windsor International Airport. This frequency is available on 124.7 MHz and designated as an uncontrolled Mandatory Frequency (MF) outside Nav Canada's normal operating hours.

Detroit TRACON

The Detroit terminal radar control unit controls air traffic over Windsor International Airport between the altitudes of 3,000 ft. and 8,000 ft. This is coordinated with the Windsor ATC Tower.

Aviation Support Facilities

Several aviation support facilities are available at the Airport. These support facilities include:

- Hangar space provided by Mara-Tech Aviation;
- De-icing services by Airway Aviation and Mara-Tech Aviation;
- Minor aircraft repair works provided by WCS Aviation (adjacent to the Windsor Flying Club lease area);
- Airside maintenance services: rubber, snow and ice removal;

- Aircraft rescue and fire fighting services;
- Aircraft tie-down and plug-in services provided by Airway, Maratech and Windsor Flying Club (generally for members only);
- Short-term public aircraft parking available on Apron II, Apron III and on Apron I, beside Great Lakes Flight Centre; and
- Branded AVGAS (100LL) and Jet A aviation fuel through Esso (provided through Great Lakes Flight Centre).

3.3.6 Passenger Facilities

The Air Terminal Building (ATB) is a two-storey structure that houses air carriers, the travelling public (as well as "meeters and greeters"), concessions, and Airport-based employees. The second floor of the ATB is primarily used as an administrative space for Airport staff, and also leased to third parties. Nav Canada operates a control tower located above the second floor of the ATB. The total area of the ground floor of the ATB is approximately 4,478m^2.

The City of Windsor recently invested $1.2 million in infrastructure improvements to the terminal. The objective of the project was to improve circulation, provide additional aircraft gates, and expand the capacity of the passenger departure lounge. The interior of the ATB was renovated to reflect a modern, up-to-date interior design. The grounds were landscaped in the spring of 2008 to create a strong first impression and recognize the Airport's commitment to protecting the environment.

Space is limited in the international arrivals and baggage hall, which affects international processing standards. The current ATB has the capacity to process one international passenger flight (B737-800) at a time within the arrivals hall. This lack of space creates congestion for international flights. The check-in area and concourse are also comparatively undersized, and cannot accommodate multiple departing flights, causing passengers to queue in the concessions and vending area.

3.3.7 Cargo Facilities

Currently, the Windsor International Airport does not provide dedicated cargo services but do facilitate expedited cargo. Any cargo arriving or departing the Airport is handled either on the ramp or through a private/charter flight company on an ad-hoc basis. The Airport has a temporary hangar with a loading dock to accommodate low volumes of cargo.

3.4 Land Use

The Airport occupies approximately 813 hectares of land and is zoned 'Airport' in the City's Zoning By-law.

3.4.1 Site Opportunities and Constraints

The Airport is both enhanced and constrained by human-made structures and natural features on-site and in the surrounding area.

- The CN Railway is located directly to the west of the threshold of Runway 07 and is considered a constraint to future development at the site, specifically the expansion of Runway 07-25 to the west. Although the Airport owns the parcel of land directly to the west of the railway, the use of this land for aviation related activities is unlikely.
- County Road 42 lies directly south of the Airport and is considered as a major transportation artery connecting the City of Windsor to parts of the County of Essex.
- An environmental protection area lies within the Airport boundary in the southeast quadrant. This area contains provincially significant wetlands and woodlots and is designated "Provincially Significant Wetland" in the City's Official Plan.
- Lauzon Parkway lies to the east of the Airport and is a major north-south transportation artery. The future development of the Parkway, including new interchanges at Highway 401 and Highway 3, will improve access to the provincial transportation network and enhance opportunities for development on the operating Airport site, as well as the adjacent Business Park on surplus lands.

- The CP Railway also borders the Airport property to the northeast. Although Runway 07-25 can be extended in this direction, the registered zoning must be adhered to and the existing displaced threshold of Runway 25 maintained.
- The adjacent CP line also provides an opportunity for a potential multi-modal rail/truck facility on the Airport lands.
- An electrical substation operated by Hydro One is located east-northeast of the threshold of Runway 25. This facility also constrains the future expansion of Runway 07-25 to the east.
- The adjacent substation will provide sustained electrical power to potential industrial users in the Business Park.
- Existing hydro transmission towers and building structures located to the east of the Airport would encroach within the obstacle limitation surfaces should runway 07-25 be extended in the future.
- Commercial and industrial land uses are adjacent to the Airport on the north boundary. They will not be affected by increased aircraft flight activity on the Airport site. The location of new ground side facilities on the north side of the Airport in close proximity to the north boundary must address land use compatibility issues such as noise and lighting.
- The north property boundary limits opportunities to complete a proposed ring road system on the Airport lands.
- Enhanced air and ground services at the Airport will provide new opportunities for other businesses that benefit from locating in close proximity to the Airport.

3.4.2 Current Airport Land Use Plan

An Airside Land Reserve Plan was prepared by LPS Aviation Inc. in June, 2003 for Serco. The plan's key objective was to provide a rational and comprehensive framework for the use and development of Airport lands, permitting the balanced fulfilment of present, as well as short and long-term needs. The plan also identified surplus land within the Airport property.

The Land Reserve Plan has been utilized by Airport management since 2003. Several recommendations were made for future land use and Airport expansion in the Airside Land Reserve Plan. These recommendations have been considered in developing the Master Plan, as well as a number of new issues and requirements.

3.4.3 On-Airport Land Use Regulations

Land use on the Airport property must respect the requirements of Transport Canada's TP312E. These aerodrome standards and recommended practices place various restrictions necessary within the Airport land area and include specific criteria for building structures on the property.

3.4.4 Vicinity Land Use

All lands in the vicinity of the Airport are subject to Windsor Airport Zoning Regulations pursuant to Section 5.4 of the Aeronautics Act of Canada. Zoning regulations in this section include:

- Preventing lands adjacent to or in the vicinity of an Airport or aerodrome site from being used or developed in a manner that is incompatible with the safe operation of an aerodrome or aircraft; and
- Preventing land uses that would cause interference with signals or communications to and from aircraft from locating adjacent to or in the vicinity of equipment or facilities used to provide services relating to aeronautics.

In the general vicinity, land use is governed by Transport Canada TP1247E Land Use in the Vicinity of Airports, and recent modifications by Nav Canada.

3.5 Airport Standards and Zoning

3.5.1 Airport Physical Standards

Canadian Airports that are 'Certified' are required to comply with national standards for Airport activities and construction.

All current operations and future expansion planning activities must observe Transport Canada's Aerodrome Standards and Recommended Practices (TP312). Compliance with these standards is compulsory to maintain the Airport's Operating Certificate.

Protective regulations are established around certain Airport facilities, components and stations to protect the safety and security of aircraft operations.

3.5.2 Physical Zoning

Physical zoning refers to the protection of the land and airspace of the obstacle limitation surface around an Airport.

An obstacle limitation surface is an area that defines the maximum permitted height of a structure in the airspace of an aerodrome so that aircraft operations can be conducted safely. Obstacle limitation surfaces include the take-off/landing zone, approach, transitional and outer surfaces. Zoning criteria are described in Transport Canada's Aerodrome Standards and Recommended Practices (TP312) and are based on runway reference codes.

Each runway has its own type of physical zoning, depending on the reference code assigned. Runway 07-25 is Code 4E-P and Runway 12-30, is Code 3D-(NP) standards.

Figure 3-2 illustrates both the Code 4E-P and Code 3D-(NP) physical zoning requirements established for both runways at the Airport.

3.5.3 Electronic Zoning

Future Airport developments and operations must also be compatible with a diverse range of electronic transmissions taking place on or near the Airport, all of which are essential to the safety of aircraft and Airport operations. Electronic zoning is designed to protect the reliability of the electronic systems of the aerodrome.

Electronic zoning criteria are identified in Transport Canada's document entitled TP1247 – Land Use in the Vicinity of Aerodromes.

The Airport is equipped with several navigation aids: an Instrument Landing System (ILS) which includes a localizer and glide path indicator, two receiver/transmitters, as well as directions finding equipment such as a VHF Omni-directional Range / Distance Measuring Equipment (VOR/DME) and a Non-Directional Beacon (NDB). All of these systems have been identified in Section 3.3.4 of the Master Plan.

Future Airport developments must follow the electronic zoning restrictions for navigational aids first established by Transport Canada and now maintained by Nav Canada.

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

3.5.4 Vicinity Land Use Zoning

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

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

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

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

Although the Windsor International Airport was not designated as a NAS Airport by Transport Canada, registered zoning is currently in place and is entitled:

Windsor Airport Zoning Regulations
Regulations Respecting Zoning at Windsor Airport, Current to August 27, 2009

Off-Airport land affected by these regulations is annotated on the Land Title to alert owners of the restrictions. All Airport development falling within the affected zones is subject to these restrictions and guidelines.

According to Airport management, the current Zoning Regulations require revision, primarily because the former Runway 02-20 is still included within the regulations, although the runway has been decommissioned and currently designated as Taxiway 'F'. It is recommended that the Registered Zoning at the Airport be revised to remove the former Runway 02-20 from the regulations and reconfirm protection for ultimate runway lengths in the future.

A review of the Regulations suggests that the zoning associated with Runway 12-30 has been configured based on a Precision Instrument runway, although Runway 12-30 is being operated as a Non-Precision Instrument facility.

Discussions with Airport management raised questions about changing the Registered Zoning of this runway to reflect the current non-precision designation. Analysis suggests that the Airport should retain the current Precision Instrument zoning associated with the runway as it provides more conservative protection for current runway operations.

Maintaining the current Precision Instrument zoning designation will also allow the Airport to designate the runway as a Precision Instrument facility in the future, without modifying the regulations once more sophisticated satellite based precision approach systems come into use.

Land uses surrounding the Airport property are also subject to policies and provisions of the City of Windsor and the Town of Tecumseh Official Plans and Zoning By-laws, as outlined in Section 2.5.

3.5.5 Noise Projections

One of the most significant environmental impacts of Airport activity can be noise generated by aircraft landing or taking off. To estimate potential noise impacts on areas in the vicinity of Airports, Noise Exposure Forecast contours (NEF) are prepared based on the types of aircraft operating at the Airport and flight frequencies. NEF contours are presented to measure the likely level of community response to aircraft noise.

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

A noise exposure forecast was prepared in November 2009 and provided to Airport management for review as part of the Master Plan.

NEF contours are presented in Figure 3-4. These contours were based on a high air traffic growth scenario, from which a representative peak day traffic distribution was calculated. The peak traffic was assumed to be primarily assigned to Runway 07-25, due to prevailing wind direction and availability of an Instrument Landing System (ILS).

Table 3-5 – Community Noise Response Predictions

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

The NEF contours appear to be conservative since:

- The model represents the high growth scenario;
- Some of the aircraft used in the model may now be considered outdated, and
- New aircraft technologies are quieter.

Increased activity levels at the Windsor International Airport could impact the size and shape of the NEF contours, depending on the frequency and types of expected aircraft use. Given that the Airport is interested in developing an inter-modal transfer hub on Airport lands, air cargo activities may increase in the medium to long-term.

In general it is expected that the increased air cargo activities could impact noise exposure to the community. However, based on the cargo volumes presented in previous feasibility studies, such as those prepared by Lufthansa Consulting, increased air cargo activities are only expected to generate approximately three additional air cargo flights per day in the maximum growth scenario and will not affect the noise exposure forecast.

3.6 Meteorological Assessment

A detailed aviation meteorological study was prepared to support the Master Plan. The study was used to determine if the Master Plan should include any actions to improve the availability and/or usability of the Airport. Many climatological and geographic factors are typically considered in an Airport meteorological assessment.

The Airport is located to the south-southeast of the City Centre, with the primary Runway (07-25) oriented in a northeast/southwest direction. A secondary Runway (12-30) is also available and oriented in an east-southeast/west-northwest direction.

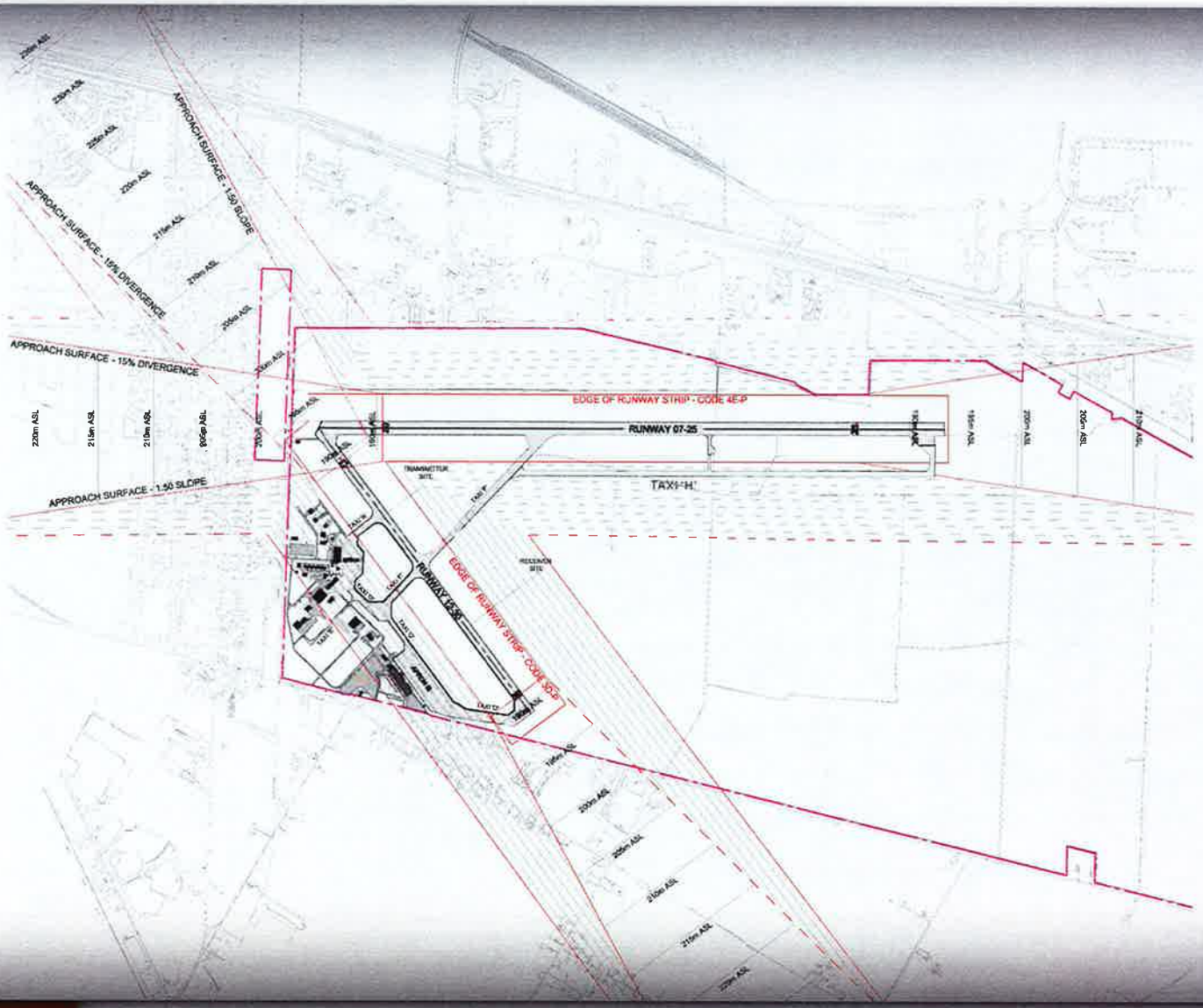
Factors that affect the ability of a runway to meet its design needs are:

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

Custom-developed software was used to down load, process and analyse very large Environment Canada database information.

Temperature

Based on more than 30 years of weather data accumulated at Windsor, the daily average temperature ranges from a low of -4.5° C in January to a high of +22.7° C in July. With this modest range (compared to other Airports in Canada) there is little variable effect on aircraft performance. In terms of average daily maximum temperature, the maximum is in July at +27.9° C and daily minimum values have been recorded in January at -8.1° C. There are only 8.1 days per year on average with a maximum high of above 30° C where aircraft performance could be particularly poor. The current runway alignments and supporting navigation systems are adequate for the types of aircraft proposed for the long-term and there is no need for runway modifications due to temperature.



WINDSOR AIRPORT MASTER PLAN

FIGURE 3-2 - AIRPORT PHYSICAL ZONING

Notes

1. Conceptual Layout
2. All dimensions approximate

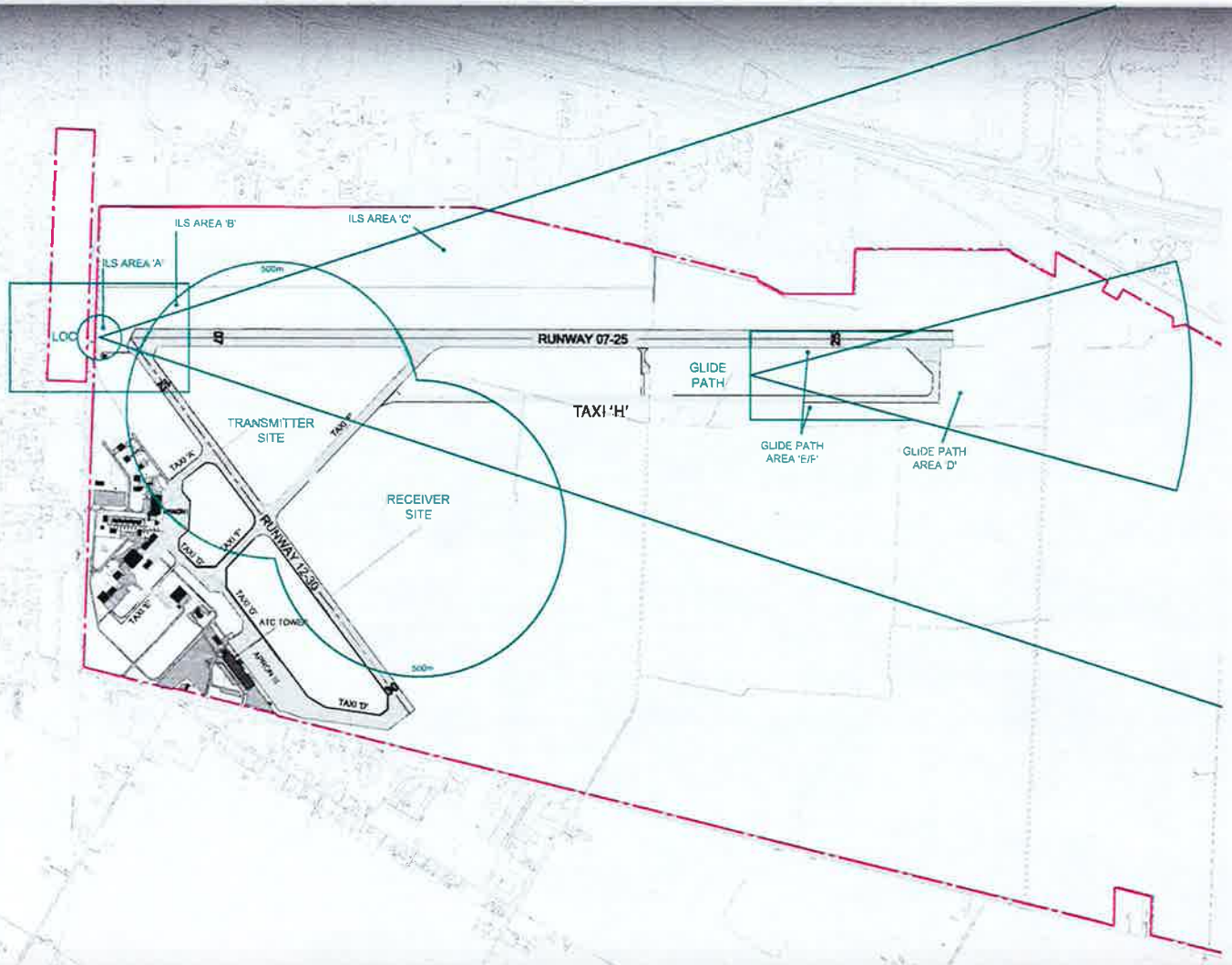
YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by AIM
Map checked by EGL

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010



WINDSOR AIRPORT MASTER PLAN

FIGURE 3-3 - AIRPORT ELECTRICAL ZONING

ILS LOCALIZER
Area A: No objects > 1.2m
Area B: No metallic objects > 1.2m
Area C: No metal walled structure > 0.8 degrees subtended
No structural steel work > 1.6 degrees subtended
No non-metal object > 2.4 degrees subtended
No service roads < 180m

ILS GLIDEPATH
Area D: No metallic fences, power lines, telephone lines, buildings, roads, railroads
Approach lighting horizontal bars to be avoided within 600m
Area E: Same restrictions as Area D
Area F: Same restrictions as Area D

RX/TX Site
<500m: No electrical noise generators
<1.6km: Recommended no electrical noise generators
<8km: No high power broadcasting

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Notes
1. Conceptual Layout
2. All dimensions approximate

Base data provided by City of Windsor Official Plan
Map created by AIM
Map checked by EGL

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

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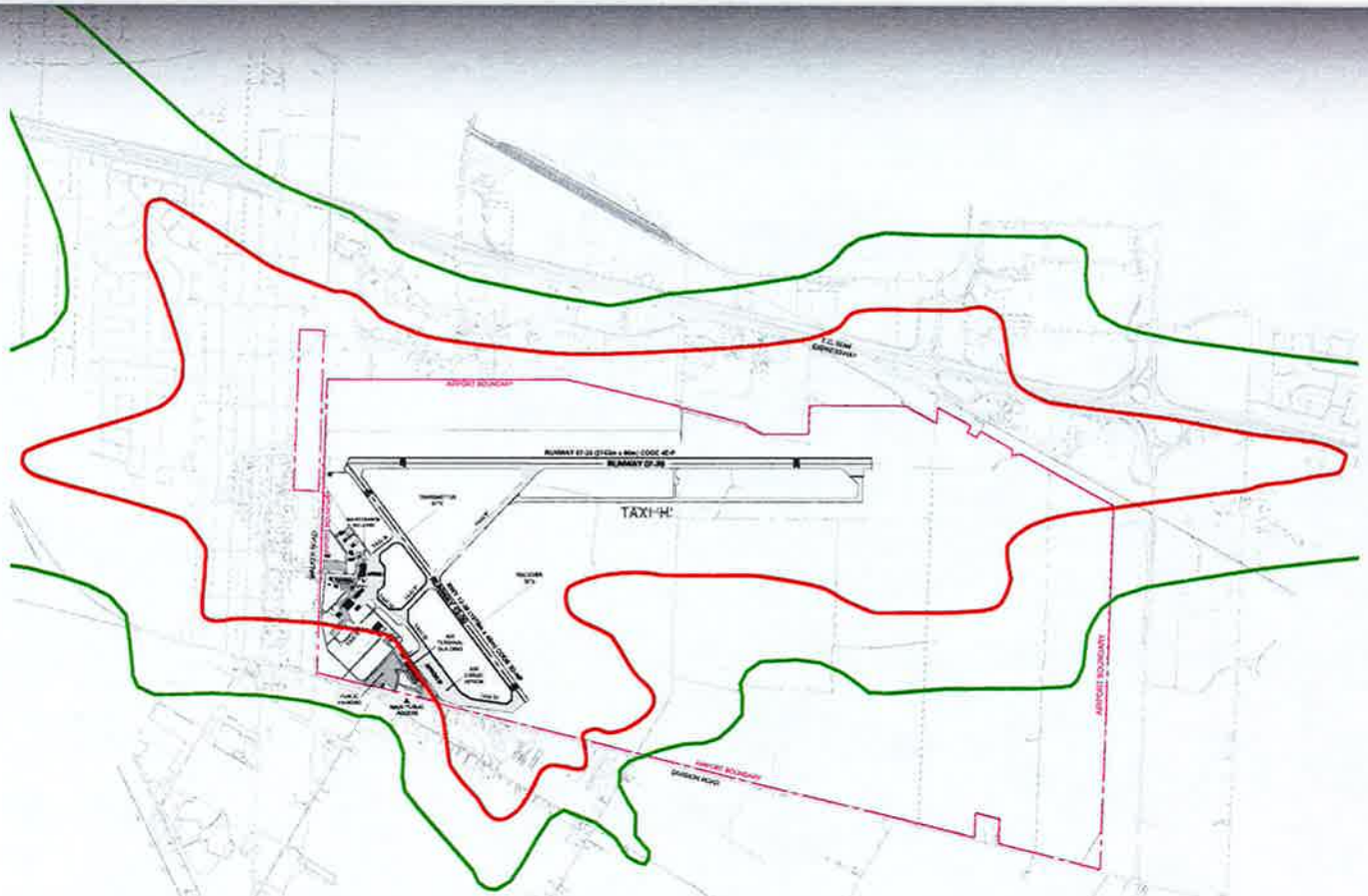


WINDSOR AIRPORT MASTER PLAN

FIGURE 3-4 - AIRPORT NOISE EXPOSURE FORECAST CONTOURS

30 NEF (NOISE EXPOSURE FORECAST)

25 NEF

Notes

1. Conceptual Layout
2. All dimensions approximate
3. Noise Exposure Forecast provided by Windsor Airport Management

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by EDH
Map checked by EGL

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/aTAXI 'H'

Project #: 09-2665
Status: n/a
Date: December 2010

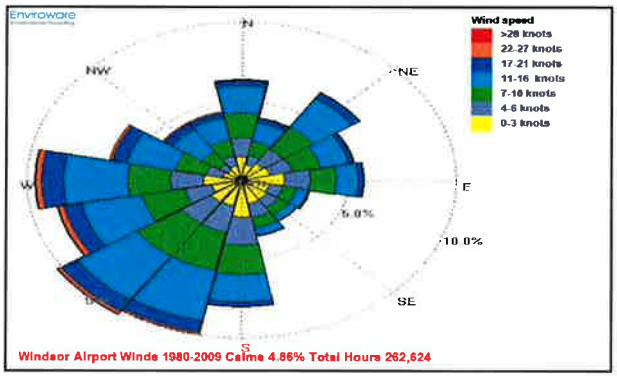
N E W S

Wind

Wind data was collected for Windsor for the period 1980-2009, and analyzed for seasonal and annual frequencies of wind directions and speeds. Specialized software was used to categorize and display wind frequencies in the form of a wind rose as shown in Figure 3-5. The wind rose displays the frequency of wind direction and uses concentric circles of wind speeds to illustrate frequency of wind speed categories for any direction.

Figure 3.5 shows the annual wind rose. The four seasonal wind roses are shown on Figure 3-6 depicting the variation of wind frequencies by season. Wind direction strongly favours the west and southwest for much of the year, with a northeast component also showing a strong tendency in the spring and summer months. These wind direction frequencies strongly correlate to the runway orientation. Therefore, wind conditions will not restrict the type of operations proposed for the Airport.

Figure 3-5 – Annual Wind Rose



Precipitation

Rainfall in the Windsor area is at a minimum in January with 21.7mm per month and at a maximum in June with 89.8mm per month. The maximum period for snowfall is in January at 35 cm. These are not considered as extreme accumulations of precipitation and the current runway structure (pavement, drainage etc.) has been reported by Airport management to be sufficient. Precipitation is not a limiting factor in terms of current or contemplated Airport operations.

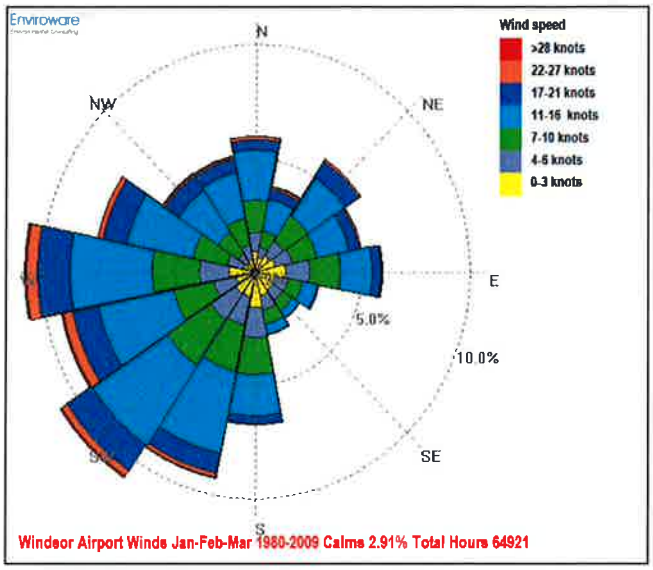
Visibility

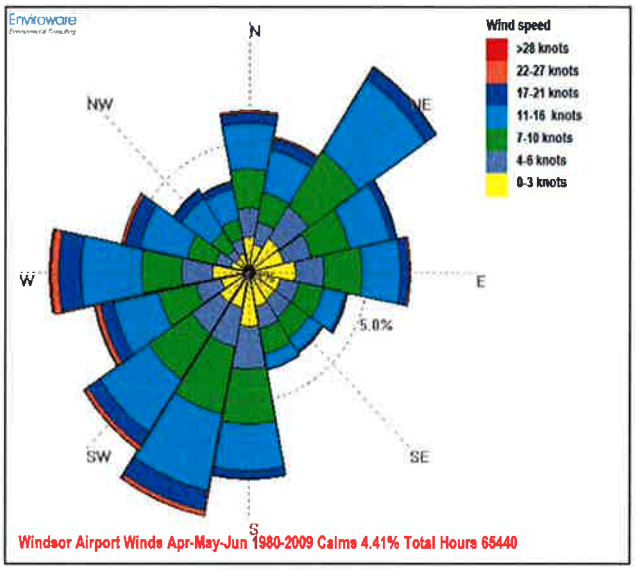
Data was collected for Windsor Airport for the period 1980-2009 (a standard 30 year climatological period) and analyzed for ceilings and visibility categories. Four categories of ceilings and visibilities were selected:

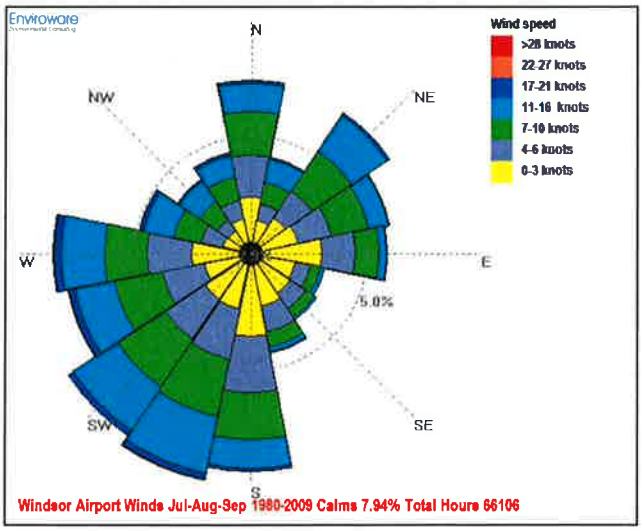
- Below VFR includes all ceilings or visibilities in each hourly report that were below 1000 feet and/or 3 miles visibility;
- Below 800 feet/and/or 2 miles refers to a category of ceilings and visibilities below alternate limits;
- Below 500 feet and/or 1.5 miles as a special category; and
- Below IFR (instrument Flight Rules) includes all ceilings and visibilities below 200 feet and/or ½ mile.

There were 262,909 hours analyzed within the sample. Results of the analysis can be found in Table 3-6.

Figure 3-6 – Wind Rose Analysis by Quarter







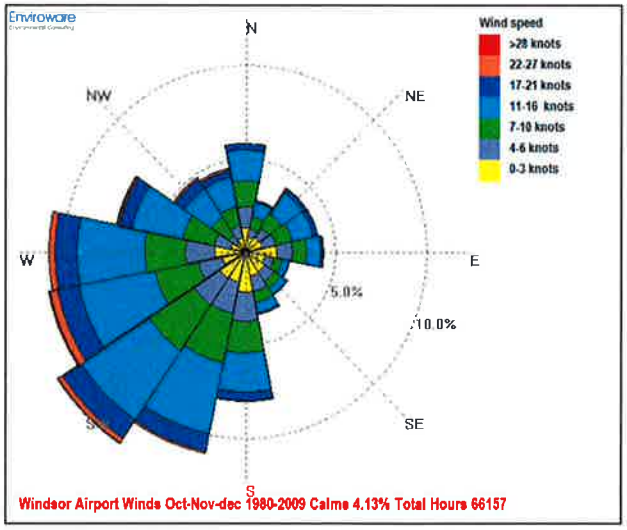


Table 3-6 – Percent Frequencies of Ceiling and Visibility Categories at YQG 1980-2009

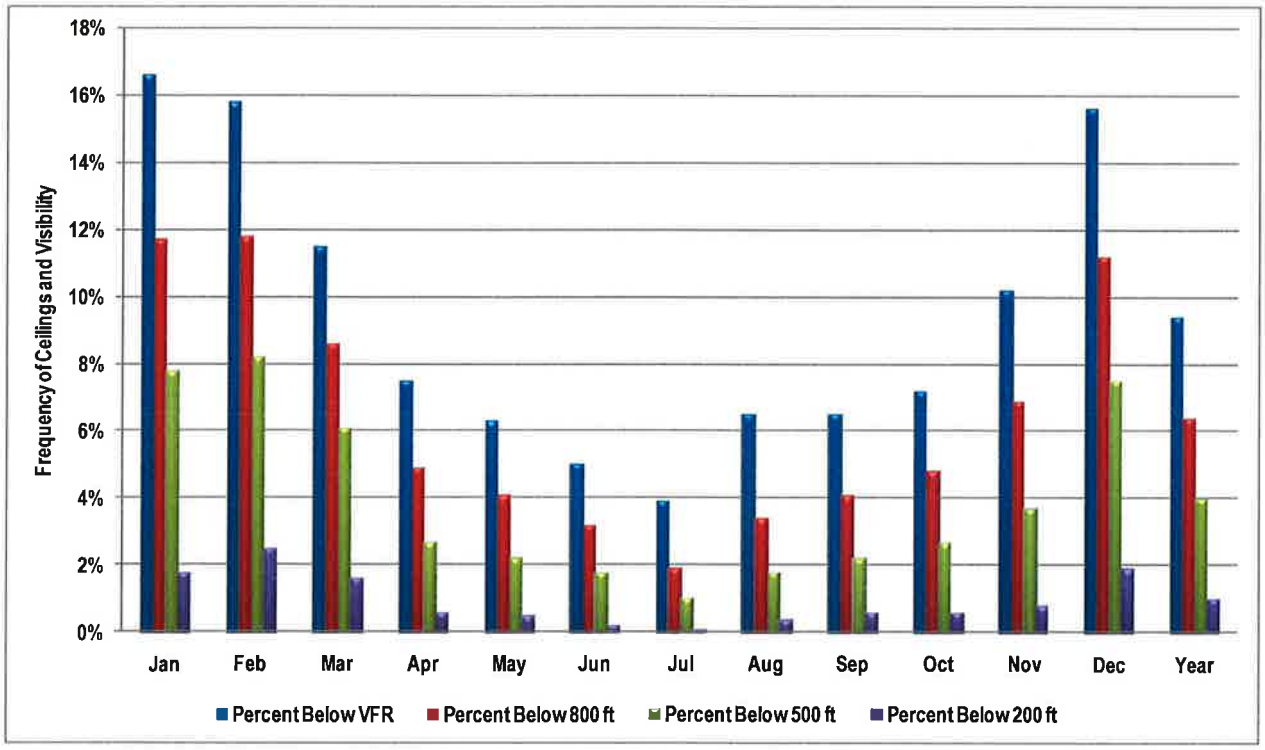
	Hours in Sample	% < VFR	% < 800 Ft &/or 2 Mi.	% < 500 Ft &/or 1.5 Mi.	% < 200 Ft &/or 0.5 Mi.
Jan	22,319	16.6%	11.7%	7.8%	1.8%
Feb	20,352	15.8%	11.8%	8.2%	2.5%
Mar	22,322	11.5%	8.6%	6.1%	1.6%
Apr	21,597	7.5%	4.9%	2.7%	0.6%
May	22,308	6.3%	4.1%	2.2%	0.5%
Jun	21,604	5.0%	3.2%	1.8%	0.2%
Jul	22,287	3.9%	1.9%	1.0%	0.1%
Aug	22,308	6.5%	3.4%	1.8%	0.4%
Sep	21,583	6.5%	4.1%	2.2%	0.6%
Oct	22,306	7.2%	4.8%	2.7%	0.6%
Nov	21,598	10.2%	6.9%	3.7%	0.8%
Dec	22,325	15.6%	11.2%	7.5%	1.9%
Year	**262,909**	**9.4%**	**6.4%**	**4.0%**	**1.0%**

The percent frequency of Below VFR ceilings and visibilities ranges from a high of 16.6 percent in January to a low of 3.9 percent in July. The trend is similar for the Below 800 feet and/or 2 mile visibility category. It peaks in January at 11.7 percent and drops to 1.9 percent in July. The highest frequency for ceilings and visibilities in the Below 500 feet and/or 1.5 miles is in February at 8.2 percent. The lowest frequency for this category is in July at 1.0 percent. The lowest category of Below 200 feet and/or ½ mile had the highest frequency in February of 2.5%. The lowest frequency for this category occurred in July at 0.1%.

The frequency of lower ceilings and visibilities at the Windsor Airport are comparable to those experienced at other Southern Ontario Airports.

Figure 3-7 illustrates the four ceiling and visibility categories displayed in a bar chart format.

Figure 3-7 – Frequency of Ceilings and Visibilities



4.1 Introduction

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

- Short-Term – 2010-2015
- Medium-Term – 2016-2020
- Long-Term – 2021-2031
- Ultimate – Beyond 2031

The aviation activity forecasts to the Year 2030 for the Windsor International Airport serve as a critical component of the Airport Master Plan. They define the likely composition and scale of passenger, cargo and aircraft movement activity through the planning period. The High and Low forecasts together define the probable range of activity. The forecasts run to 2030 in annual increments. This two-decade interval allows the Airport to consider emerging trends in the community and Canadian economy, and to plan accordingly.

Forecasts help to define the expected timing of facility requirements and required capital expenditures. The schedule of investments will be **event-driven** - as traffic reaches a certain level, the Airport will make the appropriate investments.

YQG is exploring various opportunities to create a multi-modal hub on the Airport owned lands, including an inter-modal cargo transfer facility called a "Cargo Village" and a maintenance/repair/operations facility. It is intended that additional spinoff businesses will likely develop in the adjacent Business Park or on surrounding lands. The Cargo Village project includes a cargo transfer facility, forwarding, customs brokers, distributors, warehouses and trucking, among other activities.

This project has far reaching implications for the City of Windsor by helping to "kick start" a new industrial opportunity, along with employment opportunities for residents.

The Cargo Village's indirect economic benefits include an increase in passenger traffic activity and additional revenue for the Airport. In addition, cargo activities in the Village will generate municipal tax revenue for the City of Windsor. Since the Cargo Village is important to both the City and the Airport's future, it has been provided for in the Master Plan. The plan can be updated accordingly as the proposal and financing is confirmed.

Other Airport projects could include other aviation related businesses, such as a Maintenance, Repair and Overhaul ("MRO") operation, FBO and increased general aviation (flight school, flying club, etc). Currently the general aviation accounts for the majority of the flight operations.

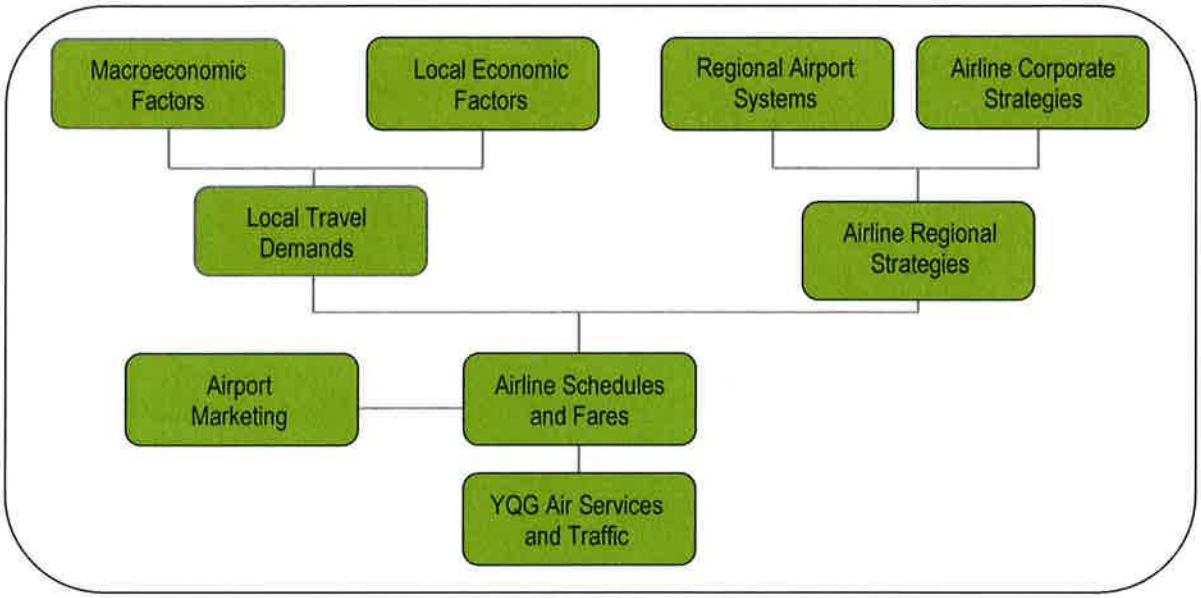
The aviation activity forecasts serve as the foundation for long-term Airport capital and land use planning. They give the Airport the flexibility to adapt to changing conditions and plan accordingly.

4.2 Future Traffic Determinants

The passenger and cargo traffic handled at an Airport depends on many factors, some operating on an industry-wide basis, and others unique to each facility. These elements determine raw traffic volumes, and the mechanisms and degree to which traffic will respond to outside stimuli. Figure 4-1 shows a simplified schematic diagram.

The "Macroeconomic Factors" box refers to all elements of the national and world economies. It incorporates current levels of output, exchange rates, capital stock, prices, unemployment, interest rates and capital markets. The GDP has widely demonstrated its power as a determinant of air traffic.

Figure 4-1 – Determinants of Airport Traffic



The "Local Economic Factors" box refers to economic variables unique to Windsor, including the strength of leading industrial sectors, unemployment rates, demographics, and government projects to stimulate the local economy. These Macroeconomic and Local Economic factors jointly determine local demand for travel. The "demand for travel" is a very broad variable reflecting all demand elements. It is not a simple quantity; rather it is a complicated function whose value depends on the totality of services and costs/fares for all modes at Windsor and Detroit.

The "Regional Airports System" refers to all Airports that serve Windsor demands. It includes the Windsor International Airport and Detroit Metropolitan Wayne County International Airport, and also the Airports of London (London International Airport) and Toronto (Pearson International Airport). Certain other Airports including those located in Flint, Willow Run, Sarnia and Toledo could also affect the Windsor-Detroit complex.

The "Airline Corporate Strategies" box refers to the planning and marketing processes of each airline that presently does, or eventually might, serve the Windsor-Detroit area[2].

It reflects the airlines' networks, cost structures, alliances, fleet plans, pricing approaches, yield management and network design (linear vs. hub and spoke). Each airline has a unique set of criteria it uses to decide to serve a particular destination. These consider traffic volumes, impacts on its flights at nearby Airports, airfares, competition, the need for community financial support, minimum service levels, whether to develop its own operation or hire third party contractors, etc.

In the box "Airline Regional Strategies," the airline adapts its overall business practices to each locality. Air Canada has decided to serve the Windsor-Detroit

[2] The Master Plan considers many factors that the Detroit and Windsor communities have in common. They help explain the interactions between certain traffic segments at the Detroit Metro and Windsor International Airports. While Detroit and Windsor enjoy a close economic relationship, the international border, and the differences between a medium-sized Canadian City and a large U.S. Metropolis mean that the two Cities cannot be viewed as a single homogenous region.

area through flights by its commuter affiliate Air Canada Jazz with Toronto as the hub.

Air Canada Jazz's Windsor flights offer a limited capacity at relatively high fares. Lower fares are accessible through higher capacity flights at Toronto or Detroit. WestJet recently resumed direct flights to Windsor from Calgary. U.S. carriers could operate to Windsor but they have chosen to access Windsor through their extensive flights at Detroit Metro. These examples illustrate that the decisions of airlines can have a decisive impact on an Airport's traffic. They are especially important in areas served by several Airports, where airlines decide how the traffic will be distributed.

The "Airports System" and "Airline Strategies" elements determine how each airline will address a particular market – the "Regional Strategies." Most urban communities have only one Airport with scheduled services. The Airport's traffic will depend on the community's population, income, industrial base and other factors. If a community has several scheduled service Airports, the volume of traffic handled by each becomes problematic. Some airlines will concentrate services at one Airport, to avoid the higher costs of a split operation or self-diversion of revenues. Other airlines may elect to serve all facilities to maximize their market penetration. A new entrant might serve a small, underdeveloped Airport to distance itself from entrenched competition, or avoid ground and airspace delays.

These factors make the traffic volumes of any Airport in a multi-airport region such as Windsor-Detroit problematic. Traffic depends primarily on the scheduling and pricing decisions of the airlines. The Windsor International Airport's traffic therefore is indeterminate and it is difficult to quantify latent traffic. The Airport could conceivably attract large volumes of traffic from Michigan and serve a volume of traffic far larger than the Ontario market alone could support. Alternatively, it could lose most of its traffic to other Airports. The forecasting challenge is to define a set of reasonable outcomes that avoids either extreme.

The factors encompassed by "Local Travel Demands" and "Airline Regional Strategies" jointly determine how each airline will serve the market. The schedules and fares are determined simultaneously. The schedule specifies the capacity and destinations served, and the fares maximize the potential of the given schedule. Each Airport, through its marketing efforts, can influence airline route decisions.

The most important factors driving Windsor International Airport's traffic are its ability to draw, attract traffic away from the Detroit Airport (including YQG Shuttle for business travellers going to downtown Detroit) and the flight and fare strategy of Air Canada/Air Canada Jazz for the Windsor service. The range of possible changes to these variables defines a very wide range of air passenger traffic. Other variables could change, but would generate much smaller changes in traffic.

4.3 Economic Environment

This section of the Master Plan sets the economic environment of the area served by the Airport, focusing on national and local economic conditions, important determinants of the demand for air transportation. However, business opportunities will also be secured through pro-active, targeted marketing by Airport management, supported by investment in infrastructure, buildings, facilities and area roads by the City with the aid of senior levels of government.

Air travel is driven by a need for people to move from location to location for business needs, to visit friends and families, or for tourism. Regardless of its purpose, the amount of travel that people undertake is determined by the economic vitality of the Country, region, and local area, and the economic and demographic characteristics of the people in the Airport catchment area. The economic downturn of 2008/10 has caused a widespread contraction in passenger air traffic and air services.

National Level

Canada's particularly strong dependence on international trade, its large commodities industries and the tightly integrated global capital markets have made the nation vulnerable to external factors. Fortunately, Canadian financial institutions have exercised conservative investment policies and limited exposure to the global financial crisis. The

Bank of Canada has maintained low short-term interest rates and the Federal Government has launched a large fiscal stimulus program. The consensus of Canadian and foreign institutions, calls for modest growth in 2010, with an accelerating recovery in 2011 (Table 4-1).

In addition, Ontario's proposed corporate income tax cuts, elimination of the Capital Tax and the proposed Harmonized Sales Tax will encourage investment.

Unlike our American counterparts, Canada has begun to experience an end to the recession in the second quarter of 2010. Stronger capital investment resulting from reduced marginal tax rates on dividend and capital gains income and modest increases in productivity will partially offset an aging and shrinking labour force. In the next decade, we can expect an average annual growth rate in GDP of 2 percent during 2009-2019 rather than the 3 percent of the last two decades[3].

Regional-Local Level

Windsor is the major employment generator in the Windsor-Essex region, home to over 800 companies, with the majority working in automotive parts manufacturing, machine tools, plastics, robotics, food and beverage processing, pharmaceuticals and chemicals.

Windsor is the centre for Canada's automotive industry. However, in the last several years, the three Detroit automotive manufacturers have experienced a loss of market share to foreign-based companies. The close integration between the Canadian and U.S. automotive industries has resulted in layoffs in Ontario. Job losses have occurred in Windsor, St. Thomas and Chatham.

Tourism, once a significant contributor to the local economy, has also been adversely affected. In recent years, lower personal incomes, an appreciating Canadian dollar, increased border security, three Detroit casinos and declining recreational travel has resulted in job losses for Caesars Windsor.

However, by the spring of 2010, growing evidence suggested that the Windsor economy was emerging from the worst of the contraction, and seeing its first growth in four years. The Conference Board believes that Windsor has good job creation prospects for the summer of 2010. In the first quarter of 2010, non-residential construction increased by approximately 45 percent over the previous year. Only Victoria and St. Catharines-Niagara exceeded this growth[4]. The $400 million Continental Rail Gateway, announced in June 2010, will link Windsor and Detroit with a railroad tunnel capable of accommodating double-stack container cars, creating 2,200 jobs. The University of Windsor and the City of Windsor are at the centre of plans to develop a renewable energy industry. The Smart Community project links over 200 sites in Essex County with a high-grade optical fibre network. The third crossing and Windsor-Essex Parkway will create manufacturing and construction jobs in the short-term and new trans-border business in the longer-term. The Windsor-Essex Parkway has been launched and is planned to be under construction in 2011 creating 18,000 new jobs.

The demand for air travel largely depends on people and businesses' financial ability to travel. Purchasing power by businesses and individuals, and residual income can affect if passengers can afford to travel; or make passengers increasingly sensitive to fares, thereby causing users to turn to Airports with cheaper flights or to cheaper modes in times of economic instability. However, Windsor is starting to experience growth, which will increase the demand for commercial and passenger air travel.

[3] See Toronto Dominion Bank Financial Group, A New Normal: Canada's Potential Growth During Recovery and Beyond, (Toronto, November 10, 2009)

[4] Source: Statistics Canada

Table 4-1 – Growth Projections for the Canadian Economy

Source	2010	2011	2012	Date
Scotiabank	3.1%	3.1%	2.6%	March 2011
Royal Bank of Canada	3.1%	3.2%	3.1%	March 2011
Bank of Canada	3.5%	2.9%	2.2%	July 2010
Bank of Montreal	3.1%	3.0%	2.7%	March 2011
Toronto Dominion Bank	3.1%	3.0%	2.5%	March 2011
CIBC	3.1%	2.8%	2.8%	February 2011
International Monetary Fund	3.1%	3.2%		April 2010
OECD	3.0%	2.3%	3.0%	November 2010
Conference Board of Canada	3.0%	2.0%	1.96%	March 2011

4.4 Passenger Traffic and Fares

4.4.1 Fares

Residents of the Windsor-Essex region primarily use the Airports of Windsor, Detroit, London and Toronto. However, both London and Detroit offer a wider range of carriers, more non-stop destinations, and more capacity than Windsor International Airport. Table 4-2 is a sample of the lowest return fares for selected destinations from each Airport, using common specifications for day of departure, length of stay and advance booking period. The table illustrates significant fare differences.

Table 4-2 – Lowest Return Fares to Selected Destinations (CDN $, Taxes Included)

	Originating Airport		
Destination	Windsor	London	Detroit
Calgary	$1,020	$368	$567
Edmonton	$940	$340	$550
Halifax	$779	$496	$721
London UK	$1,181	$853	$902
Los Angeles	$908	$560	$332
Montreal	$810	$780	$531
New York City	$773	$330	$264
Orlando	$884	$421	$313
Ottawa	$725	$678	$524
St. John's	$885	$764	$863
Tokyo	$1,272	$1,126	$1,004
Toronto	$534	$462	$508
Vancouver	$1,124	$483	$533
Winnipeg	$859	$280	$511

Depart March 5, 2010. Return March 14 2010. Lowest available fare. Search on Orbitz, January 6, 2010

Passenger choice of Airport is highly sensitive to fare differentials. It is especially significant that travel to high volume Canadian destinations has often been considerably cheaper from Detroit than from Windsor. Services to Canada from Detroit are often more direct than from Windsor and competition is stronger. As a Canadian City, with many ties to areas throughout the nation, Windsor likely generates a significant volume of domestic travel. Canadian markets would figure prominently in any attempt to build volume at Windsor.

Air Canada Jazz provides less capacity to Windsor than when it flew 102-seat DC 9-30s and offered non-stop flights to Toronto, Winnipeg, London and occasionally Montreal and Ottawa. A lower capacity is now provided and the airline sets its fares to fill the limited capacity offered. The lower fare market segments are not broadly served.

These dynamics make it difficult to estimate the "true" size of the Windsor-Essex market. Actual Airport traffic volumes severely underestimate the market size. A traffic market study is required to determine the true size of the Windsor-Essex market. There are no satisfactory statistics available to estimate this market in the absence of a study.

4.4.2 Passenger Traffic

The Detroit and London Airports make future projections of Windsor International Airport's traffic problematic. Current traffic volumes, recent inter-Airport fare differentials, and anecdotal evidence from interviews suggest high rates of "leakage."

Conversely, the Airport has, in the past, captured traffic originating in Michigan that might otherwise use the Detroit Airport.

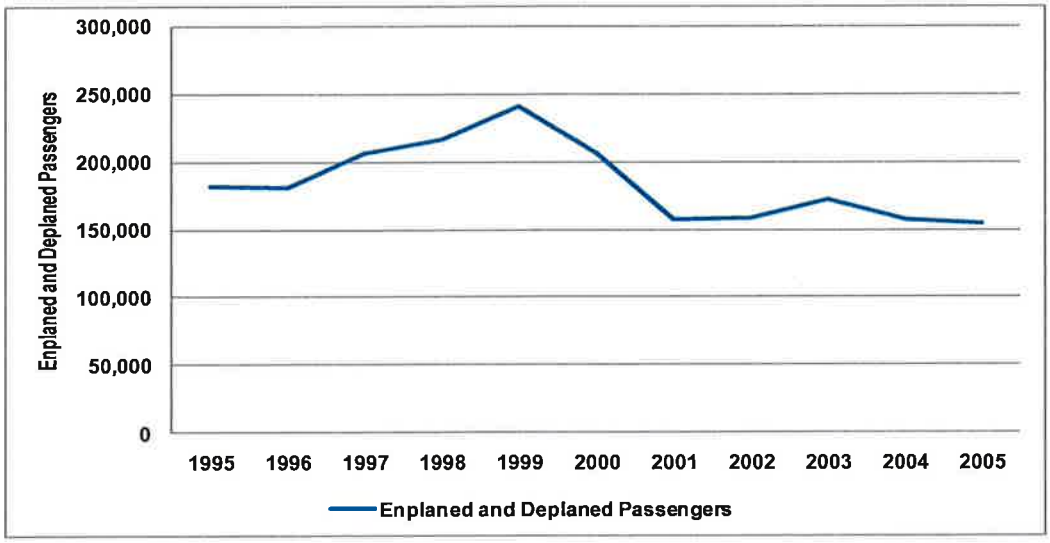
The complex multi-airport competition and inter-airport fare differentials mean that the Windsor International Airport serves only a portion of its region's "true" traffic.

This is very common for small and medium-sized Airports, but the relationships governing Windsor are particularly sensitive to competitive conditions. The Statistics Canada Report 51-203, "Air Carrier Traffic at Canadian Airports" gives annual enplaned-deplaned traffic for the largest Airports. However, data is unavailable for 2006, 2007, 2008 and 2009. The Windsor International Airport reports 2007, 2008, 2009 and 2010 annual passenger traffic as 121,269, 116,397, 110,400, and 142,756 passengers respectively. In 1999, Statistics Canada discontinued its domestic origin-destination survey.

A cross-sectional econometric model suggests that the Windsor-Essex Region generates 611,103 inbound and outbound passengers annually (Appendix A). They use several Airports, including Windsor and Detroit. This demand is much greater than the number of passengers actually using the Airport, as shown in Figure 4-2, and displayed in Appendix B, Table B-1. With a 2007 traffic capture of 118,251 passengers, the Windsor International Airport is "spilling" 492,852 passengers per year. It is noted that the model does not consider any US catchment by Windsor International Airport. A true market study is required to validate these statistics.

The airlines serving Windsor responded to the new bilateral agreement of the late 1990's with fares designed to minimize the loss of domestic passengers through Detroit. The market stimulation more than offset the loss of some traffic to Detroit. However, the subsequent declining traffic and large fare differentials suggests that Air Canada Jazz no longer wishes to compete with the Detroit airlines even for Canadian domestic passengers.

Figure 4-2 – Windsor International Airport Enplaned and Deplaned Passengers



Source: Statistics Canada Report 51-203X, "Air Carrier Traffic at Canadian Airports", (Ottawa 1996-2009)

During 2006-2009, only one scheduled airline, Air Canada Jazz, continuously served Windsor. Statistics Canada follows strict rules about protecting proprietary data, and cannot report Windsor's traffic for this period. Traffic reported by Windsor International Airport in this period includes both scheduled and charter traffic volumes. The table shows very unstable traffic through recent history. This is characteristic of Airports operating in multi-Airport regions, where individual airlines can impact wide fluctuations in traffic.

Earlier growth in the 1995-1999 period resulted from competition between Air Canada and Canadian Airlines International. The subsequent merger caused traffic to fall. Between April 1, 2003 and October 30, 2005, WestJet operated a non-stop Windsor-Winnipeg flight. When it discontinued the service, it redeployed the aircraft to London. Despite WestJet's presence, the Airport's 2005 volumes were 15 percent below those of 1995.

The traffic volumes in the period 2006-2008 reflected the subsequent loss of WestJet, the reduced capacity, resultant higher average fares, the recession, and Windsor's weak economy.

Since 2008, Windsor has capitalized on opportunities in both the charter and commercial passenger market. YQG has become a departure point for the package vacation market to the Caribbean. For example, Sunwing offers a weekly charter service for vacation package travellers to Cuba during the winter season. In 2010, WestJet resumed its service to Windsor with a daily non-stop flight between Windsor and Calgary. It is expected that the traffic volumes for 2009-2010 will reflect this increase in flights out of Windsor International Airport. This increase in activity is a result of the change in management to YQG and their enhanced marketing efforts. A true market study is required to validate these statistics.

4.4.3 Inter-modal Competition

VIA Rail operates intercity passenger trains through the Windsor/Sarnia/Quebec City rail corridor.

The Government of Canada has assisted VIA Rail in upgrading its passenger services. In 2009, VIA Rail announced a $17 million upgrade for the Chatham Subdivision. VIA Rail plans to construct a new station for Windsor for $6 million. It will be located close to the existing station, and open in the fall of 2011.

VIA Rail offers four trains daily from Windsor to Toronto. As it upgrades its track, it may increase its services or operate its trains at faster speeds. The passenger trains could have positive or negative impacts on the Airport. A commercial airline might offer flights with sufficiently low fares to attract rail passengers. The forecasts recognize the possibility of new services by Porter Airlines to Toronto. These flights would appeal to many rail passengers because of the proximity of the Billy Bishop Toronto City Airport to Toronto Union Station. Passengers traveling onwards could also benefit. Alternatively, the trains might attract passengers who would otherwise fly. The traffic forecasts make no explicit allowance for VIA's market shares. However, the more aggressive forecasts would result in the shift of some rail traffic to the air mode.

4.4.4 Implications for Forecasting

The competitive dynamic in the region poses the following issues for developing forecasts:

- The volume of Windsor's scheduled traffic for 2006-2009 was not available when this analysis was prepared.
- Windsor International Airport's traffic has been falling since 1999. The volume for 2005 was 35.9 percent less than that of 1999. A continued decrease is untenable.
- The Airport's reported traffic has been very volatile, with significant swings in total traffic. Between 1986 and 1993, domestic origin-destination traffic fell by 49.2 percent. This could be partly due to non-reporting airlines.
- Windsor traffic is very sensitive to competition, particularly through its impact on fares and leakage.
- The current fares charged by Air Canada Jazz reflect a desire to serve only the highest fare paying segments at Windsor. The small traffic volumes fill Air Canada Jazz modest capacity. The segments paying lower fares are forfeited, mostly to U.S. carriers at Detroit.
- There is a link between competing carrier scheduling and pricing decisions. Air Canada's new London-Western Canada services closely followed the new WestJet flights to western Canada from the region.
- These competitive, price and leakage effects overwhelm the influences of national GDP and the Windsor-Essex economy.
- Information on Windsor's historical fares might enable development of a traffic determination model. Information on Detroit's domestic fares by carrier and destination is readily available. The model will require estimates of future fares.
- Forecasts for Windsor, therefore depend on assessing the competitive strategies and pricing practices of individual airlines.
- It is a challenge to predict the actions of airlines with any degree of accuracy. Statistical processes apply best to a large population, with each member acting independently. The number of airlines directly influencing traffic at Windsor is small, and their decisions are strongly interdependent. The units of response – new flights, are large in comparison to the total activity. An added problem is the scarcity of origin-destination and fare data. Consequently, it is a challenge to generate statistically rigorous forecasts for Windsor. Even with extensive traffic leakage data, comprehensive schedules, and an explicit modeling of Windsor/London/Detroit Airport choice, it is difficult to predict airline behaviour.
- A modeling process which bases forecasts on certain high probability events is therefore deemed appropriate for the Windsor International Airport.
- A traffic market study on the true size of the Windsor-Essex market is strongly recommended to validate the results of the model.

4.5 Approach and Assumptions

The future volume of passenger traffic at the Windsor International Airport will depend primarily on the interaction of carriers at the London, Windsor and Detroit Airports. The resulting fare differentials, which reflect carrier capacities, will determine if the region's passengers are served through the Windsor, Detroit or London Airports.

The complexity of the multi-airport traffic allocation process, limited data, and the decisions of airline managers preclude a rigorous and well structured forecasting methodology. The forecasts therefore include a base level of traffic reflecting current activity. It experiences steady organic growth. A series of incremental scenarios capture the impacts of several hypothetical but plausible air service changes and correspond to discrete changes in Windsor's air services. The baseline traffic, when combined with some or all of the scenarios, will span the likely range of passenger traffic at the Windsor International Airport.

4.5.1 Baseline Case

The Baseline Case assumes that Air Canada Jazz will continue to operate its Windsor-Toronto service. Beginning in 2014, Air Canada will introduce larger Q400 turboprops, with 70 seats, and adjusts its pricing to reflect the larger aircraft. This will encourage passengers to fly to Toronto, other Canadian destinations, the United States and overseas. The Q400 aircraft would operate at a 70 percent load factor.

The Baseline Case also includes the Caribbean and Mexican charters presently operating, which include WestJet and Sunwing flights. Total traffic will experience an annual growth of 3.2 percent[5]. Several incremental cases could generate additional traffic.

[5] Source: Boeing Current Market Outlook, 2009-2028 (Chicago, 2009). Boeing predicts that the North America market will expand by 3.2 percent yearly through to 2028.

4.5.2 Porter Airlines

In 2011, Porter Airlines would provide two daily services to the Billy Bishop Toronto City Airport. This would increase short-haul capacity at the Airport for both Air Canada Jazz and Porter Airlines, increasing the number of flights to high volume destinations in Canada.

4.5.3 WestJet

On May 31, 2010, WestJet restored services to Windsor. The daily flight to Calgary will operate until October 30, 2010. The forecasts include the new service, and assume that a seasonal operation would continue in 2011. In 2012, it would upgrade its services to a single daily year-round. It would add one additional flight every three years, until reaching a maximum of four flights in 2021. WestJet's flights would operate primarily to western Canada. The service would restore competition to western Canada and recapture Canadian passengers who travel to western Canada through Detroit.

4.5.4 Augmented Charter Services

Additional charter flights by Sunwing or other potential carriers would also be implemented. In 2011, a charter carrier would add one additional weekly flight over and above the Airport's current services. Every three years, an additional flight would be added, to a maximum of seven flights each week. The charter flights would operate six months of each year and use 150 seat aircraft with a 90 percent load factor. Local charter flights, for example C-208 Caravans to Pelee Island, are expected to continue at current levels, or grow modestly.

4.5.5 New Services by Air Canada

Air Canada and its Jazz affiliate would continue to defend its market strength in eastern Canada. In 2005, it launched non-stop services from Montreal and Ottawa to Hamilton. The airline would also introduce air services at the Billy Bishop Toronto City Airport, to counter the growth of Porter Airlines. It expanded its direct London-Western Canada services in response to inroads by WestJet and would likely respond to any WestJet or Porter expansion at

Windsor. Air Canada would increase capacity in 2012 and increase frequency in 2016 and 2020. The flights would use 70-seat turboprops with a 70 percent load factor. An increased in frequency and expansion in air services by Air Canada would be initiated if new services by WestJet or Porter gain a successful foothold in the Windsor market.

4.5.6 Trans-border Flights

This scenario calls for 2 flights per day service by a 50-seat aircraft to a U.S. hub by 2014. Prospective destinations could include Cleveland (Continental), Philadelphia (US Airways), Newark (Continental), Chicago (United or American) and Minneapolis (Delta). The proposed frequency is characteristic of a new hub centered service by a regional jet to a low volume destination. The 75 percent load factor is equal to the average performance of regional jets operating to and from Detroit in 2008 on domestic routes[6]. An airline starting the service would consider the risks of diverting traffic from its parallel Detroit flights.

4.5.7 Most Likely Case

The scenarios can be combined in several ways to generate many future estimates of traffic. The following "Most Likely" combination offers the most plausible series of market events, and the most useful basis for preparing the Airport Master Plan:

- Baseline, with services by Air Canada Jazz and charter airlines;
- Inauguration of services to Toronto by Porter Airlines;
- Augmented charter services; and
- An introductory trans-border air service.

When Air Canada Jazz regains entry to the Billy Bishop Toronto City Airport, the resulting competition can lead to an increase in flight services.

The other scenarios are considered to be speculative. The capacities of the B737 types operated by WestJet are somewhat large for the Windsor market and may limit the number of flights. Air Canada is considered likely to launch longer haul services in response to competition to WestJet and Porter. The limited Windsor traffic base, proximity to the Detroit Airport, and the high operating costs of regional jets will limit the likelihood of direct Windsor-United States services.

Appendix A provides the Passenger Demand Forecast Methodology used by LPS AVIA. Appendix B, Table B-2, summarizes the passenger forecasts. Appendix C shows the corresponding landings and takeoffs of commercial passenger flights.

4.6 Air Cargo Potential

Air cargo services provide an efficient and effective mode of travel for the shipment of goods and services, which affects supply chain management and contributes towards a strong contribution of the local economy.

4.6.1 Current Air Cargo Activity

Air cargo activity at the Windsor International Airport has been modest. Current air cargo activity is primarily expedited cargo for automobile companies. Table 4-3 shows cargo activity over the 1997-2008 period. The limited traffic (1,743 kilograms per day in 2008), reflects cargo status as a by-product of passenger services.

[6] Source: United States Department of Transportation Domestic T-100 Segment Report, 2009

Table 4-3 – E/D Cargo Windsor (Tonnes)

Year	Enplaned and Deplaned Cargo (Tonnes)
1997	51
1998	416
1999	7,037
2000	2,569
2001	405
2002	706
2003	656
2004	420
2005	241
2006	230
2007	1,345
2008	638

Source: Statistics Canada Report 51-203X, "Air Carrier Traffic at Canadian Airports"

Air cargo volumes are very sensitive to equipment used on passenger flights. The airlines will attempt to fill any otherwise empty belly space with cargo. The regional airlines currently serving Windsor use aircraft with little cargo capacity.

Air Canada Jazz serves Windsor with Dash 8s. Depending on passenger loads, checked luggage and other factors, these aircraft can physically accommodate about 225 kilograms of cargo.

However, the timing of flights does not necessarily coincide with the needs of shippers. Sometimes, the airline cannot use the capacity because of the need to cycle aircraft quickly through the Pearson hub. The Dash 8s accept small, bulk-loaded items. Narrow body aircraft such as the 737 can carry about 1,360 kilograms; however, WestJet does not focus on a cargo product. Other B737 operators could carry air freight on southern charter services. However, the high density seating and seasonal, low frequency services limit this role.

Wide body passenger aircraft, such as the Boeing 777, offer considerable capacity and can accept standard air freight unit load devices. All-cargo aircrafts require very high unit revenues to be economical. Except for serving the integrators, they are economical only under very special circumstances.

The integrated carriers serve Windsor-Essex by trucking shipments to and from other airports. As the region's traffic grows, Windsor International Airport might obtain non-stop all-cargo flights to Toronto, Louisville, Memphis and Hamilton. These flights would use terminals specially constructed by the integrators.

4.6.2 Future Air Cargo Activity

The City of Windsor retained Lufthansa Consulting to prepare a Market Potential Analysis for Windsor International Airport and a concept for the cargo development facility.

Based on this report, the City of Windsor is considering the development of an air cargo terminal for road feeder service and freighter on lands adjacent to the active Airport. The first step would be construction of a Phase I air cargo terminal. This would alleviate the Airport's current of lack cargo facilities.

Eventually, the air cargo terminal has the opportunity to expand to a more comprehensive facility developed at the Airport. This could ultimately serve as the core of a "Cargo Village" for multi-modal transfer operations and logistics services. The Most Likely Case[7] would rely primarily on trucking, and charter services by dedicated all-cargo aircrafts would increase in the long-term. Table 4-4 and Figure 4-5 summarize the cargo forecasts prepared by Lufthansa Consulting.

The Master Plan accommodates the proposed Phase I and subsequent terminals, the Cargo Village, and growth in air cargo volumes. The forecasts include large quantities of traffic traveling by truck.

A key goal of the Master Plan is to accommodate a wide range of future needs, and position the Airport to respond effectively once the Cargo Village plans become more solidified. As the Windsor-Essex economy strengthens, the Airport will be in a good position to also meet the needs of businesses and respond to growing shipping demands. In addition, if

[7] Source: Market Potential Analysis for Windsor International Airport, Page 95, Section 6.2, (Windsor, September 2009). Prepared by Lufthansa Consulting

the airlines increase air services and serve various geographies, this will provide opportunities to ship to airports in cities that are geographically positioned to meet demand.

The Airport Master Plan does not include the Cargo Village forecasts because the Village would rely primarily on trucks, and the planning is in the early stages.

4.7 General Aviation Trends

4.7.1 General Aviation Forecasts

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

A common definition of general aviation is that it encompasses all flight activity except air services by large aircraft operating on a unit-toll[8]. It thus excludes scheduled services[9]. The sector is therefore defined most commonly in terms of what it does **not** include.

4.7.2 Categories and Recent Trends

The Canadian Aviation Statistics divide general aviation into four segments:

Other Commercial

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

Published databases still suffer from the wrongful inclusion of scheduled flights in reported general aviation totals.

This category includes the subsidized winter charter flights to Pelee Island. The Government of Ontario finances these services when ice blocks operation of the Leamington-Pelee Island ferry.

Private

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

Civil Government

Any flight undertaken by a civilian governmental organization is included in this category. Common applications include transportation of senior government officials and police operations such as enforcing speed limits, inmate transfers and recognisance.

Military

Flight operations by Canadian and foreign national defence forces are covered in this category.

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

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

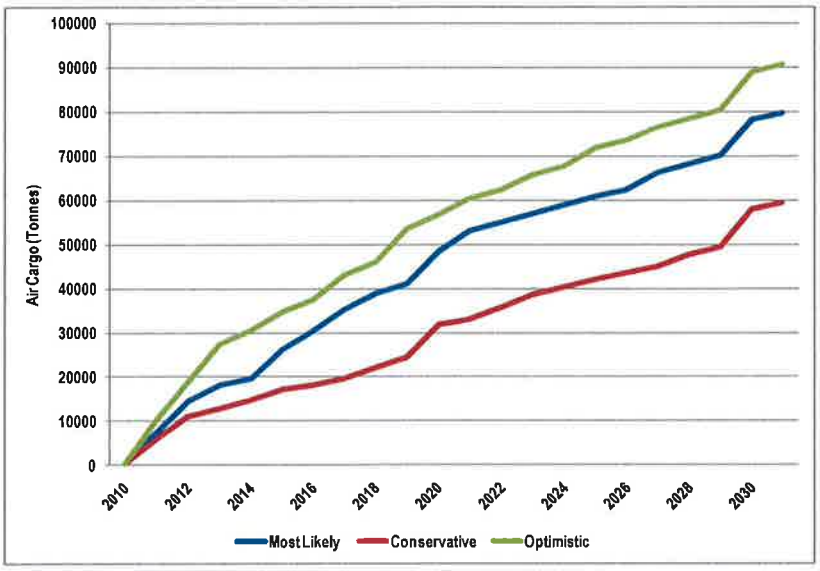
[9] The Canadian definition of aviation does include some services of small charter aircraft in the "Other Commercial" of general aviation

Table 4-4 – Cargo Terminal and Cargo Village Development - Market Potential Analysis

	Most Likely (Tonnes)	Conservative (Tonnes)	Optimistic (Tonnes)
2009	161	161	161
2010	263	245	265
2011	7,391	5,975	10,393
2012	14,488	11,023	18,916
2013	18,133	12,859	27,461
2014	19,718	14,642	30,516
2015	26,121	17,240	34,748
2016	30,396	18,206	37,357
2017	35,283	19,542	43,106
2018	38,913	22,130	46,076
2019	41,173	24,459	53,596
2020	48,500	31,822	56,671
2021	53,175	33,144	60,366
2022	54,999	35,825	62,273
2023	57,010	38,638	65,693
2024	58,942	40,360	67,724
2025	60,907	42,113	71,868
2026	62,441	43,437	73,526
2027	66,316	45,017	76,486
2028	68,171	47,672	78,456
2029	70,057	49,326	80,459
2030	78,149	58,020	89,031
2034	79,708	59,349	90,713

Source: Lufthansa Consulting: Feasibility Study, Air Cargo Development at Windsor International Airport, Annex 1

Figure 4-3 – Cargo Terminal / Cargo Village Development - Cargo Forecast



Source: Lufthansa Consulting: Feasibility Study, Air Cargo Development at Windsor International Airport Annex 1

Statistics Canada reports annual flight operations by Airports in the publication 51-210 "Aircraft Movement Statistics." The document includes scheduled and charter flights of large passenger and cargo aircraft.

One category covers carriers in Groups IV-VI. These companies generated less than $1 million in each of the two years preceding the report.

Recent Trends

Statistics Canada reports local movements at each Airport, but does not necessarily include any breakdown according to the other commercial/private/civil government/ military classification system. Local movements consist mostly of training flights at Windsor. Figure 4-6 depicts recent general aviation activity at the Windsor International Airport.

The graph highlights the importance of local movements to the Airport. This traffic has been very volatile. Local movements primarily involve flight training, and any changes in the Airport's flight school activity can have a pronounced impact on total traffic. The Airport has a flying club, and a flight training school which is an accredited private college.

4.7.3 Forecasting Methodology

Between 1996 and 2008, the general aviation statistics for Windsor did not reveal strong correlations between real Gross Domestic Product, Gross Capital Formation, Personal Income, Price of Aviation Gasoline or other macroeconomic variables. Some variables, such as private aviation, showed a downward trend.

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

Another estimation problem is that general aviation has been declining globally for decades. Between 1996 and 2007, the four major categories together fell by 24.2 percent[10]. At some airports, any trend, time series or regression analysis can theoretically predict that the sector might disappear altogether.

[10] Source: Statistics Canada, Aircraft Movement Statistics

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

A second general aviation trend analysis conducted by Statistics Canada compared Windsor to airports throughout Canada, in southern Canada, and finally to Southern Ontario alone. A cross-sectional econometric model considered each community's population, economic base and income. It included a series of estimates to determine what level of general aviation activity each community "should" have. While the model produced statistically satisfactory results, the results for Windsor implied implausibly high growth rates.

A third approach, using a simplified cross-sectional method, considered the relationship between total regional incomes and general aviation activity for Southern Ontario. This method calculated target activity levels for Windsor and their implicit growth rates. Where the computed rates were either negative or excessively large, a 1 percent annual rate as recommended by the Federal Aviation Administration[11] was applied.

General aviation forecasts are illustrated in Figure 4-6 and provided in Appendix D.

4.8 Conclusions

Based on the analysis, assumptions and activities described, forecasts have been provided for:

- Enplaned and deplaned passengers (Most Likely, Maximum);
- Aircraft movements (Most Likely, Maximum);
- General Aviation operations (Most Likely, Maximum); and
- New Air Cargo (Conservative, Most Likely, Optimistic).

Passenger markets show considerable complexity. Air Canada Jazz has offered minimal services, and priced its products for premium travelers.

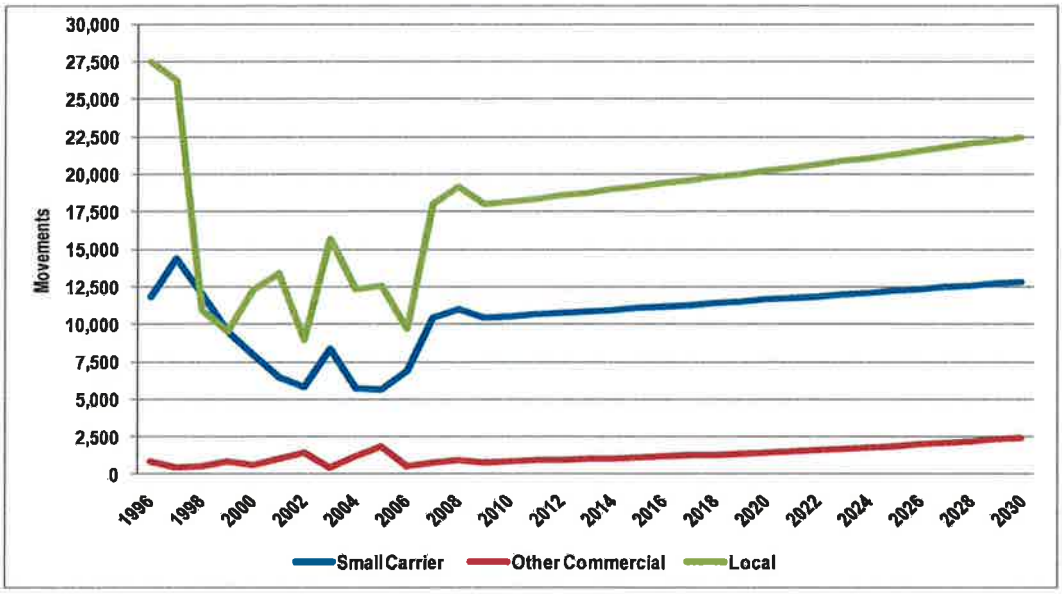
New entrants or any other factor that lowers Windsor's fares could have a dramatic impact on traffic. In the absence of such competitive action, the high fares at Windsor could persist, and frustrate traffic growth indefinitely. The "Maximum" scenarios call for aggressive traffic growth.

The cargo forecasts include the freight using the road feeder services of the proposed new Cargo facilities as documented in the Air Cargo Development Feasibility Study prepared by Lufthansa Consulting. This Airport Master Plan addresses both air freight services as well as truck freight services which normally do not affect airside operational requirements.

The general aviation forecasts call for slow and consistent evolutionary growth. Stronger growth could be expected if the Airport attracts new tenants, such as a flight school.

[11] Source: Ms. N. Shellabarger, Director, Aviation Policy and Plans, Federal Aviation Administration, presentation "National Forecast Overview 2009-2025" Slide 19, FAA and Contract Towered Operations, (Washington, March 31 2009)

Figure 4-4 – Historical and Projected General Aviation Activity



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

5.1 Airfield System

5.1.1 Runways

The Meteorological Assessment demonstrates that the current runway alignments remain appropriate for long-term planning purposes and that additional runways are not required. Consequently, the large tract of land on the east side of the Airport may be considered for aviation and supporting uses and/or Business Park and other employment uses.

The current runway system efficiently serves all current charter, scheduled, government and general aviation traffic. The primary Runway (07-25) is capable of accommodating all current traffic, as well as the aircraft types and frequencies in the forecasts. To increase the payload and/or range of large Code E cargo aircraft in the future, runway extension may be beneficial; however, site constraints limit the potential expansion to a maximum of 3,048m (10,000 ft.).

- **It is recommended that land be reserved for extension of Runway 07-25 to 3,048m (10,000 ft.) in the event of regular use by B747-400 cargo aircraft, and these aircraft have a requirement to carry higher loads over longer distances than may be undertaken with the current runway length.**

Based on forecasted aircraft movements, the expansion or modification of Runway 12-30 is not warranted. This runway is effective for current Airport use and should be adequate for the duration of the planning period.

Existing runway pavements will require regular maintenance in order to extend the life of these assets. In particular, Runway 12-30 will require repaving in the short-term (2016). Reconstruction of these assets is not expected to be required within the planning horizon of this Master Plan.

- **It is recommended that the Airport continue regular maintenance of runway facilities, particularly Runway 12-30.**

5.1.2 Taxiways

Consultations have revealed that the current taxiway infrastructure is sufficient to support the airside system throughout the planning period. The capacity analysis presented in Section 5.1.4 supports this statement. However, some expansion of the current taxiway system is required to expedite the quick movement of aircraft from one airside area to another and to limit possible congestion on the aprons.

A parallel taxiway (Taxi 'H') was completed in 2010 connecting the threshold of Runway 25 to Taxiway 'F'. In addition, the Holding Bay was upgraded to a taxiway (Taxi 'I') serving Runway 7-25 and Taxi H. These taxiways increase the capacity of the runway system and Taxi 'H' also provides access for development of adjacent airside commercial lands. In the event Runway 07-25 is extended to 10,000', Taxi 'H' could also be further extended to serve the new threshold of Runway 25 and facilitate aircraft circulation and to provide additional access to adjacent airside commercial land.

- **It is recommended that land be reserved to allow future extension of Taxi 'H' to serve an extension of Runway 07-25 and to provide access to airside commercial land.**

In the interests of runway safety, and to avoid opportunities for runway incursions, it is good planning practice to limit the number of access points to a runway. Consequently, development of airside employment lands in the northwest corner of the Airport will require construction of a taxiway serving this area. These lands could potentially be used for cargo and general aviation development and other employment activity.

- **It is recommended that a taxiway be constructed north of Runway 07-25 to provide access to employment lands.**

The new taxiway should provide access to the thresholds of Runways 07 and 12, and access to Runway 07-25 near the mid-point of this runway.

Development of airside employment lands in the southern portion of the Airport and adjacent to Runway 12-30 requires provision of taxiway access to these lots. In addition, use of this area for large aircraft maintenance and support activities will necessitate ready access to Runway 07-25 by larger aircraft which require a long runway for operations.

- **It is recommended that a taxiway be developed on the east side and parallel to Runway 12-30 to provide access to the new south employment areas This taxiway will also provide access for heavy aircraft to/from these employment lands to Runway 07-25.**

All new taxiways should be constructed based on operational need.

Existing taxiways will require regular maintenance in order to extend the life of these assets. Reconstruction of these assets is not expected to be required within the planning horizon of this Master Plan.

5.1.3 Aprons

Apron expansion should be undertaken based on operational need. Apron I, which is currently used primarily for Airport maintenance purposes, may be expanded to serve air cargo requirements accommodating narrow body (Code C) freighter aircraft. An area for accommodating wide body (Code E) freighter aircraft might also be required in the future. To achieve this objective, the apron could be expanded to the east and south, away from the Runway 12-30 transitional surface, and to intersect with Taxiway 'G'.

- **It is recommended that Apron I be expanded in the vicinity of Taxi 'G' in the event parking is required on a regular basis for B747-400 cargo aircraft. This will protect the precision approach zoning surface supporting Runway 12-30.**

Apron III, the main public apron, is of sufficient size to support current and forecasted aircraft movements. Expansion of the apron will not likely be required in the short-term. Figure 5-1 illustrates the existing apron configuration and apron management plan. To make provision for potential new air services at Windsor International Airport, an allowance for a westerly apron expansion is included in the Master Plan to accommodate several aircraft in each passenger category: Air Taxi + Commuter; Regional + Trans-border; and Mainline + International.

Protection of this land for apron expansion will make the Airport more attractive to a broad combination of air carriers in the future.

- **It is recommended that land be reserved for westerly expansion of Apron III in the event passenger growth beyond the traffic forecasts is achieved.**

Figure 5-2 - Apron Expansion Concepts, illustrates the recommended expansion of Aprons I and III when demand warrants these investments.

At some point beyond the planning horizon of this Master Plan, factors such as the growth in passenger traffic and related constraints to further building expansions, or the cost of ongoing repairs based on the age of the existing building may require the relocation of the air terminal core facilities to the infield of the Airport property. When this growth occurs, a new apron will be required in the infield, serving a new air terminal building. The most appropriate location for this apron would be near the centre of the Airport with access from Taxiway 'H'.

- **It is recommended that a land reserve be established in the infield adjacent to Taxi 'H' for ultimate development of a new apron and associated air terminal complex.**

Existing aprons will require regular maintenance in order to extend the life of these assets. Reconstruction of these assets is not expected to be required within the planning horizon of this Master Plan.

5.1.4 Capacity

Airside capacity was assessed to estimate the maximum throughput capability of the runway and taxiway system. Typical fleet mixes were developed from official 2008 movement statistics (Statistics Canada's document TP577 – Aircraft Movement Statistics).

Analysis suggests that the Airport runways can accommodate approximately 58 movements per hour under VFR conditions. This metric assumes that Air Traffic Control (ATC) and radar services are provided, at least one runway is equipped with an Instrument Landing System (ILS), and the number of aircraft arrivals and departures are equal.

Due to the current and expected aircraft movement volumes at the Windsor International Airport, the current capacity is expected to meet the needs of the Airport for the planning horizon. Additional runways will also not be required within the planning horizon of this plan as current capacity is adequate. The addition of taxiways paralleling Runways 07-25 and 12-30 will further increase the maximum throughput capacity of the runway system.

5.2 Air Navigation Facilities

5.2.1 ATC Tower

The Air Traffic Control (ATC) Tower is located in the centre of the ATB. The facility is owned by the Airport and operated by Nav Canada. Windsor ATC is in operation daily between 0630 hours and 2230 hours, local time. It provides Airport control services to all traffic on the manoeuvring area of the airfield and to all aircraft flying in the vicinity of the Airport below 3,000', including aircraft leaving or entering Canadian airspace from the Detroit Metropolitan Wayne County Airport (DTW).

Current traffic levels at Windsor do not require an ATC tower operation by Nav Canada. However, a number of unique factors justify operation of the tower. These factors include:

- adjacency of the Detroit Terminal Airspace control zone;
- the inter-relationship of ATC services in this Canada – US border zone;
- the presence of additional US Airports within the control zones;
- the participation of Windsor ATC controllers in cross-border ATC control; and
- the long time establishment and operation of an ATC tower at Windsor Airport.

Nav Canada undertakes modernization of ATC tower facilities periodically on a national basis. Airport management has identified a number of concerns with the current facility including its advanced age (the facility which was constructed with the original terminal building), the longevity of the building systems, and the relatively low height of the ATC cab. Development of certain facilities in the Airport infield (e.g. high structures) might potentially be limited by line-of-sight restrictions from the current ATC tower. In order to fully develop the infield of the Airport, the ATC tower facility may have to be relocated to the infield at some point in the future. A suitable ATC Tower Reserve has been identified in the Development Plan.

- **It is recommended that a land reserve be established in the infield near the intersection of Runways 07-25 and 12-30 for construction of a new control tower should this be required due to development of higher buildings and structures in certain portions of the infield.**

5.2.2 Flight Service Station

Windsor International Airport does not have a Flight Service Station (FSS) which normally provides advisory services to pilots. Advisory services to pilots are provided by the ATC tower (which provides both advisory and control services) and by the centralized London Flight Information Centre (FIC). Together, these Nav Canada facilities provide a more comprehensive service than would a stand-alone FSS. An FSS is not required in the foreseeable future; however, if the current ATC facility is downgraded to an FSS, the land reserve designated for the ATC would be an ideal location for an FSS.

5.2.3 Navigation and Landing Aids

The available instrument landing (ILS) approach is limited to Runway 25.

Visual aids include:

- SSLAR approach lighting RWY 25;

- Threshold and high intensity runway edge lighting RWY 07 and 25;
- Precision approach path indicator (PAPI) lights RWY 07 and 25;
- Runway Identification Lighting System (RILS) on RWY 07;
- Runway threshold and end lights on RWY 07 and 25; and
- Guard lights protecting entry to Runway 07-25 in low visibility conditions located on Taxiways 'F','H', 'I' and near the end of Runway 30.

Electronic aids include:

- Instrument Landing System (ILS) on RWY 25;
- Distance Measuring Equipment (DME);
- VHF Omni-Directional Range (VOR); and
- Non-Directional Beacon (NDB).

Medium and long-term requirements will depend on the demands of aviation operators, as well as the desired level of service and emerging new airborne and ground-based navigation and landing technologies.

5.2.4 Aviation Meteorology

The existing Meteorological Observation facility (MET) site is located on groundside, in front of the main terminal. This site is used to determine such meteorological events as wind speed and direction, barometric pressure and temperature, and other important atmospheric conditions. Currently, there are no known issues with the equipment or facility site at its present location. The weather observation capability at the Airport is sufficient to support operations for the short and medium planning horizons. As part of a national modernization program by Nav Canada, an Automated Weather Observation System (AWOS) has been installed beside Taxi 'H' near the intersection with Taxi 'I'.

5.3 Air Terminal Building

5.3.1 Assessment Methodology

The space requirements for Windsor International Airport's Air Terminal Building (ATB) were assessed using established methodologies. The assessment methodologies follow space and functionality requirements developed by Transport Canada (TC), the International Air Transport Association (IATA), the U.S. Federal Aviation Administration (FAA), as well as other industry sources and planning metrics.

Requirements were determined for various functions including, but not limited: check-in, airline operations, baggage screening, passenger screening, airside departure, government inspection, arrivals and baggage, and some administration areas.

The primary industry metric used to determine ATB space and functionality requirements is the Typical Peak Hour Passenger (TPHP). TPHP is defined as the critical number of passengers in the peak hour of the average peak day, of the peak month of the year. A review of air carrier schedules, combined with stakeholder consultations identified Tuesdays, between the hours of 1200 and 1600 as the average peak period.

Transport Canada developed the Systemized Terminal Expansion Program (STEP) as a guide for the design and progressive expansion of small air terminals such as Windsor. Space standards contained in the STEP program are based on peak passenger volumes, established through empirical studies of a large number of air terminals.

Key elements of the TC program are applicable to Windsor International Airport. Additional regulatory and operational requirements have been considered reflecting the recent requirements of Canadian Air Transport Security Authority (CATSA), facilities to support international flights, and expanded commercial facilities, among other issues impacting ATB design. In the absence of new Canadian standards in some areas, industry metrics and recommended standards promulgated by the FAA and IATA have also guided requirements for Windsor.

TPHP values are used in conjunction with IATA Level of Service (LOS) standards to assess typical space requirements within the ATB.

The Level of Services (LOS) delivered by an air terminal are typically classified on a letter scale from A to E as depicted in Table 5-1.

Table 5-1 - ATB Levels of Service

Level	Quality	Characteristics
A	Excellent	Conditions of free flow, no delays; excellent level of comfort.
B	High	Conditions of stable flow; high level of comfort.
C	Good	Condition of stable flow; acceptable throughput; systems in balance.
D	Adequate	Condition of unstable flow; delays for passengers; conditions acceptable for short periods.
E	Unacceptable	Unstable flow; conditions seriously limiting the capacity of the system.

Typically, an air terminal building designed to LOS 'A' is expensive and not necessary, particularly when the Airport experiences only brief periods of intense activity each day. Transport Canada typically sized air terminal buildings to operate at LOS 'B' after five years of service. Airports with limited access to capital funds may opt to size their facilities to LOS 'C' (Good). In addition to lower capital costs, this latter size will attract lower operations and maintenance expenditures on an annual basis.

5.3.2 Current Air Terminal Capacity

The Windsor International Airport ATB serves approximately **126,000** passengers per annum. The ATB currently has an area of **4,716m²** excluding the second floor which is occupied by Airport administration and others.

The following aircraft mix was considered in assessing the current TPHP of Windsor International Airport:

- 2 x B737-800; and
- 1 x DHC8-300

Based on air carrier schedules, analysis and consultations, a current **TPHP of 157** passengers has been identified for planning purposes for the current facility.

This value is based on modelling typical departing passenger arrival rates at the ATB facility. It assumes that departing passengers arrive at the ATB in 10 minute intervals, beginning at 120 minutes before scheduled departure times (T-120), until 30 minutes before departure time for domestic flights (T-30) and 60 minutes before international departures (T-60). These passenger arrival rates generally reflect the shape of a 'bell curve'. This type of modelling has been recognized by industry organizations such as IATA, the FAA and other international Airport authorities.

Based on the current volume of passengers, it is estimated that departing passengers are currently experiencing **LOS 'B' Level** as there is adequate space for travelers in pre-boarding security and departure lounge areas.

5.3.3 Operational Deficiencies

Air terminal developments should be sized and configured to efficiently support current and forecasted passenger movements, and generate adequate amounts of Airport revenue to support future developments. Air terminal development schematics are based on practices recommended by IATA supplemented with a modified version of the TC STEP program.

A detailed analysis examined the current areas provided for major air terminal functions including: check-in areas, airline operations area, baggage screening, passenger screening, airside departure areas, government inspection areas, arrivals and baggage, and administration areas. The areas required for each of these functions are based on industry standards and practices.

The current ATB space allocation is shown in Table 5-1. Deficiencies based on the current volume of peak passengers are identified. The existing air terminal ground floor plan and functional use assignments are illustrated in Figure 5-3.

There are several significant immediate deficiencies:

- The queuing area at check-in needs to be improved as it does not satisfy the space requirements of an Airport with a **TPHP of 157**.
- Passengers arriving on international flights are currently experiencing a LOS 'E' or lower during peak periods as the arrival and baggage hall are smaller than the recommended size, suggesting that unstable flow and capacity limiting conditions are present.

It is apparent that the ATB requires a larger capacity for international and trans-border passengers arriving at Windsor International Airport.

- **It is recommended that an immediate expansion program be undertaken to provide additional space for passenger check-in queuing, international and trans-border arrivals, related amenities and concessions.**

Generally speaking, the ATB is of adequate size to support a TPHP of 157; however, the current building configuration is not considered optimal as some functions currently meet or exceed space requirements. In order to achieve a better level of service for a TPHP of 157, the ATB could be modestly expanded to 5,250m^2, in addition to some reconfigurations. Detailed architectural assessments would be required to optimize each functional space assignment.

5.3.4 Short-Term Requirements

By the year 2015, the **TPHP is projected to rise to 253**. In order to achieve a LOS 'C' during the peak periods, most functional areas on the main floor of the terminal building will need to be expanded. Table 5-3 provides a space program for expanding existing areas to meet a LOS 'C' with a TPHP of 253.

The overall ATB ground floor area needs to be expanded in the short-term, to a minimum of 5,800m^2 to serve the peak passenger volumes that are projected. Some reconfiguration is also required to achieve an acceptable level of service.

Short-term expansion of the ATB is illustrated schematically in Figure 5-3.

Key issues are described below.

Check-in

The check-in areas, which include check-in counters, queuing areas, offices and other necessary amenities, were assessed. Based on a TPHP of 253, four (4) additional check-in counters are required while the total check-in area needs to be increased by 60%, in order to meet the LOS 'C' criteria. A total of twelve (12) check-in counters and a total queuing area of 354m^2 will be required.

Passenger Screening

Areas related to passenger screening facilities currently include two metal detectors and two x-ray machines for carry-on luggage. With a typical peak hour passenger increase of 96 passengers (from 157 to 253), one additional metal detector and an additional x-ray machine will be required to maintain LOS 'C'. Approximately 50m^2 of space is recommended to support the additional metal detector, x-ray machine and supporting circulation area.

There are also areas provided for those passengers awaiting security screening, known as the security queue. Currently, an area of roughly 40m^2 is designated for the security queue. The required area will need to be increased to 105m^2 to support a TPHP of 253 passengers. This value is based on a recommended maximum wait time of 15 minutes.

CATSA Support

CATSA currently occupies office space within the ATB to support passenger and baggage screening operations. The current office space of 80m^2 is sufficient and no expansion or additional space is anticipated to be required for CATSA operations in the short-term.

Departures Holdroom

Based on a TPHP of 253, in addition to a standard circulation allowance per departure gate, the

departure lounge will need to be expanded by approximately 90% from the current size of 434m^2.

Currently, 80m^2 of this space is allocated for washrooms within this area. This meets the requirement for short-term development. There is no essential need for additional washrooms to be developed in the airside departures area.

Domestic Arrivals

Domestic arrivals areas include a baggage claim device, and a baggage claim area. Based on the projected flight schedule and an assumed load factor of approximately 75%, a domestic Peak Arriving Passenger (PAP) volume was established. A standard metric of approximately 0.3 linear metres of baggage claim frontage per passenger should be provided. Based on a projected PAP volume of 166 and a load factor of 75%, approximately 37m of baggage claim frontage should be provided. The existing baggage claim device provides an estimated 31 metres of claim frontage, suggesting that additional capacity should be provided for the short-term flight schedule. This suggests that the baggage claim device requires expansion by approximately 37.5m^2.

The domestic baggage claim area will need to increase to 166m^2 in the short-term to accommodate the increased passenger loads based on the recommendation that 1.0m^2 should be provided per PAP, at a 100% load factor in order to account for "meeters and greeters". The PAP as a result of the projected flight schedule remains the same throughout all planning horizons.

International Arrivals

The international baggage claim areas were evaluated based on the current flight schedule. The baggage claim device located adjacent to the government inspection provides approximately 37 linear meters of frontage. Based on a PAP of 189 passengers at a 75% load factor, approximately 42m of linear frontage should be provided. Providing this additional linear frontage would require an increase in area of the actual claim from its current size by approximately 40m^2.

The international baggage claim area will need to increase to 142m^2 in the short-term to accommodate the increased passenger loads based on the recommendation that 1.0m^2 should be provided per PAP, at a 75% load factor. "Meeters and greeters" are not accounted for in the international baggage as they are not permitted in this area due to customs and immigration regulations.

Expansion Strategy

Short-term improvements and the expansion of amenities should build upon, and take advantage of, investments already made in the ATB facilities. Improvements should be undertaken progressively to avoid interruption to Airport operations and to limit inconvenience to passengers and other users.

Figure 5-3 illustrates expansion of certain passenger processing functions in the ATB, and provides a general guide as to how each functional activity may be expanded.

- **It is recommended that the air terminal be expanded to meet projected growth in passenger traffic in the short-term.**

The existing ATB was opened in 1958 and has undergone various expansions and modernization over the last 52 years. To properly assess the optimum strategy for each improvement identified, and to ascertain the need for building systems improvements, a detailed engineering study of the existing facility is required. Based on the results, architectural design concepts may be developed and detailed costs prepared to upgrade the ATB as found necessary, and to provide the necessary increases in capacity in certain functional areas.

- **It is recommended that an engineering study of the complete ATB be undertaken prior to embarking on any ATB improvement programs.**

5.3.5 Medium and Long-Term Requirements

Once the ATB has been expanded to meet the short-term (2015) requirements, further expansion will be required for the year 2020 assuming the growth projections contained in the forecasts are realized. In the medium-term, a **TPHP of 276** is projected by the year 2020.

Long-term requirements are subject to many additional and as yet unforeseen factors. Peak hour passenger patterns, and traffic peaks cannot be reliably projected for the year 2030. Simple extrapolation is one means of estimating future long-term TPHP, assuming linear traffic growth, and other factors remain in balance. On this basis, a **TPHP of 290** may be projected for the year 2030.

Table 5-3 provides space requirements for Current (2010), Short-Term (2015), Medium-Term (2020), and Long-Term (2030) expansion programs, assuming traffic grows as projected in Chapter 4.

Expansion Strategy

Expansion towards the airside is not recommended in the medium and long-term, due to the proximity of Runway 12-30 and the height limits runway zoning places on aircraft parked on Apron III. These restrictions impact the ability to park aircraft with high vertical tail surfaces near the terminal and reduce with increasing distance from the runway. Historically, aircraft tail heights have grown over the years as aircraft size and aerodynamic designs have evolved.

Significant expansion of the ATB in an easterly direction is not recommended due to the general narrowing of the available groundside site. It will become progressively more difficult to provide enlarged terminal approach roads, terminal frontage roads, traffic circulation and, if necessary, a major intersection at the public access point off County Road 42. Limited easterly expansion of the ATB could be undertaken to accommodate modifications to current facilities.

There is adequate space for significant ATB expansion in both westerly and southerly directions as existing roads and parking can be realigned.

- **It is recommended that Medium-Term and Long-Term ATB expansion follow a westerly axis paralleling the current and future Apron III layout and that expansion should proceed southerly towards the groundside to increase the overall width of the ATB.**

The strategy for progressive expansion of the ATB is indicated with arrows on Figure 5-3.

Table 5-2 – Current ATB Space Assessment (TPHP 157, LOS=C)

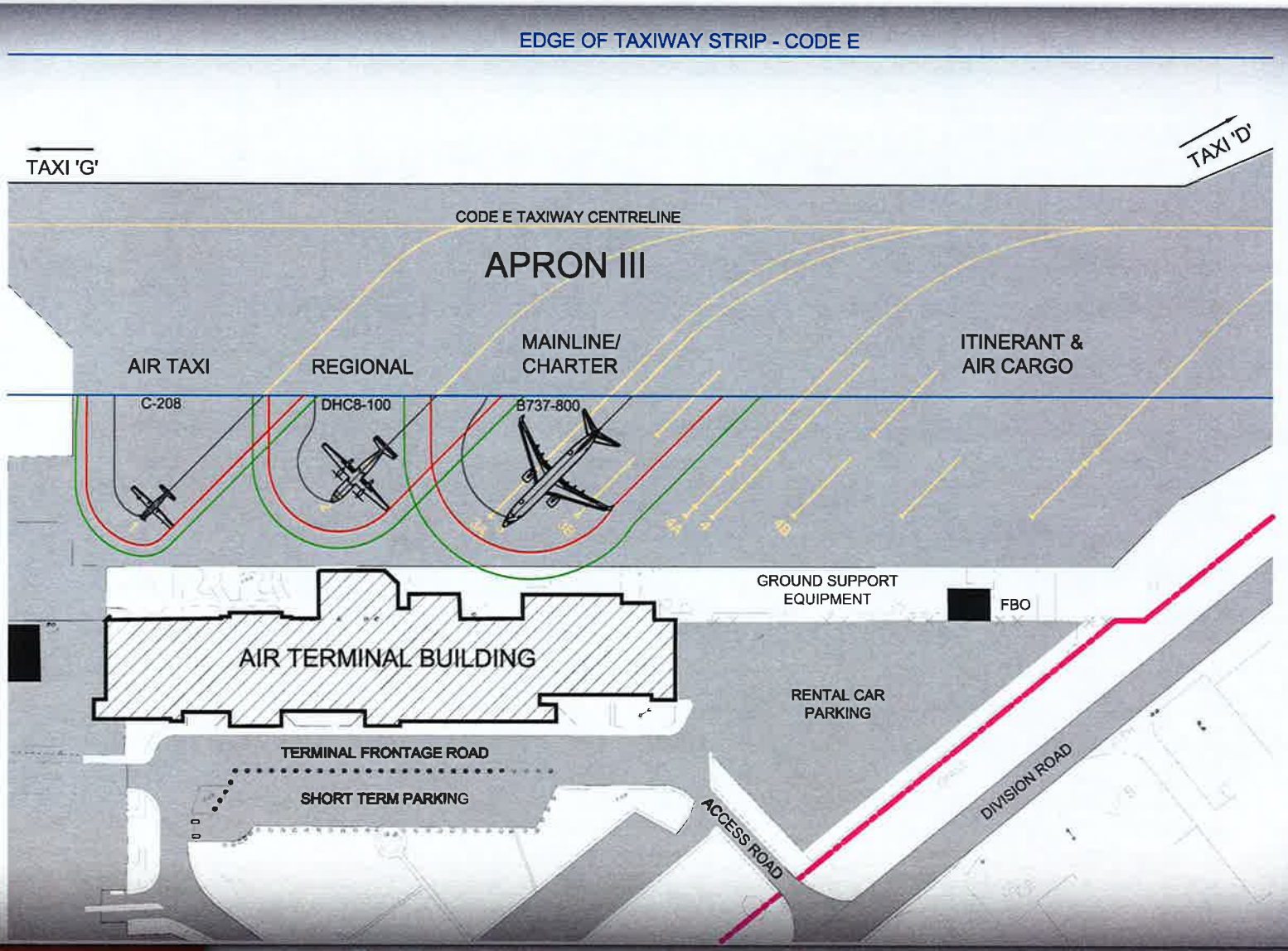
Terminal Elements	Actual Area	Recommended Area	Variance	Comments
Check-in Area	m^2	m^2	m^2	
Check-In Counters	60.0	52.0	8.0	
Queuing	82.5	219.8	-137.3	Remedial action recommended
Offices	67.9	60.0	7.9	
Concessions	30.0	21.6	8.4	
Telephones	2.0	2.0	0.0	
Washrooms	47.4	40.0	7.4	
Baggage Belt Allowance	29.3	27.0	2.3	
Airport Security	18.4	18.4	0.0	
Vending	12.0	8.0	4.0	
Sub Total - Check-In Areas	***349.5***	***448.8***	***-99.3***	
Airline Operations Area				
Aviation Support Offices	162.0	162.0	0.0	
Indoor Ground Handling Equip. Storage	39.7	39.7	0.0	
Staff Washrooms	7.0	7.0	0.0	
Sub Total - Airline Operations Area	***208.7***	***208.7***	***0.0***	
Passenger Security				
Metal Detector & Carry-On X-Ray Inspection	135.8	100.0	35.8	
Security Queue	40.0	70.6	-30.6	Remedial action recommended
CATSA Security Office	73.4	80.0	-6.6	
Sub Total - Security	***249.3***	***250.6***	***-1.3***	
Baggage Security				
Outgoing Baggage Inspection & HBS	105.0	78.5	26.5	
Secure Outgoing Baggage Assembly	287.0	78.5	208.5	
Sub Total - Baggage Security	***392.0***	***157.0***	***235.0***	
Airside Departure Areas				
Departure Lounges	428.0	318.4	109.6	
Concessions	41.0	75.6	-34.7	Remedial action recommended
Washrooms	69.1	40.0	29.1	
Sub Total - Airside Departure Areas	***538.1***	***434.0***	***104.1***	
Arrivals & Baggage				
Baggage Claim Device (domestic)	62.1	21.0	41.1	

Terminal Elements	Actual Area	Recommended Area	Variance	Comments
Baggage Claim Area (domestic)	50.7	35.0	15.7	
Baggage Claim Device (int'l)	72.1	113.4	-41.3	Remedial action recommended
Baggage Claim Area (int'l)	112.2	141.8	-29.6	Remedial action recommended
Common Use Baggage	320.1	282.0	38.1	
Concessions	0.0	10.8	-10.8	Remedial action recommended
Telephones	2.0	2.0	0.0	
Washrooms	19.1	20.0	-0.9	
Car Rental Counters	37.4	20.0	17.4	
Sub Total - Arrivals & Baggage Areas	***694.6***	***646***	***48.6***	
Government Inspection				
Customs Queue	171.8	189.0	-17.2	Remedial action recommended
Immigration Inspection	19.6	19.8	-0.2	
Baggage Inspection	86.1	85.2	0.9	
Customs Office and Lunchroom	49.6	48.4	1.2	
Washrooms	29.7	20.0	9.7	
Customs Detention	25.4	25.0	0.4	
Sub Total - Government Inspection	***382.3***	***387.4***	***-5.1***	
Administration				
Meeting Room, Washrooms and ECC	149.6	15.0	134.6	
General Storage	41.6	40.0	1.6	
Kitchen/Coffee Area	18.1	15.0	3.1	
Subtotal - Administration	***209.3***	***70.0***	***139.3***	
SUBTOTAL	***3023.6***	***2602.5***	***421.1***	
Building Services, Equipment & Other	604.7	520.5	84.2	
SUBTOTAL	***3628.3***	***3123***	***505.3***	
Circulation Allowance	1088.5	936.9	151.6	
TOTAL	***4716.8***	***4059.9***	***656.9***	

Table 5-3 – Recommended ATB Space Requirements

Terminal Elements	Current TPHP 157 , LOS=C	Short-Term TPHP 253 , LOS=C	Medium-Term TPHP 276 , LOS=C	Long-Term TPHP 290 , LOS=C
Check-in Area	m^2	m^2	m^2	m^2
Check-In Counters	52.0	78.0	84.5	91.0
Queuing	219.8	354.2	386.4	406.0
Offices	60.0	120.0	140.0	140.0
Concessions	21.6	54.0	74.2	94.5
Telephones	2.0	2.0	2.0	2.0
Washrooms	40.0	40.0	40.0	40.0
Baggage Belt Allowance	27.0	40.5	44.0	48.0
Airport Security	18.4	18.4	18.4	18.4
Vending	8.0	8.0	8.0	8.0
Sub Total - Check-In Areas	***448.8***	***715.1***	***797.5***	***847.9***
Airline Operations Area				
Aviation Support Offices	162.0	162.0	162.0	162.0
Indoor Ground Handling Equip. Storage	39.7	39.7	39.7	39.7
Staff Washrooms	7.0	7.0	7.0	7.0
Sub Total - Airline Operations Area	***208.7***	***208.7***	***208.7***	***208.7***
Passenger Security				
Metal Detector & Carry-On X-Ray Inspection	100.0	150.0	150.0	200.0
Security Queue	70.6	105.0	112.5	127.5
CATSA Security Office	80.0	80.0	80.0	80.0
Sub Total – Security	***250.6***	***335.0***	***342.5***	***407.5***
Baggage Security				
Outgoing Baggage Inspection & HBS	78.5	126.5	138.0	145.0
Secure Outgoing Baggage Assembly	78.5	126.5	138.0	145.0
Sub Total - Baggage Security	***157.0***	***253.0***	***276.0***	***290.0***
Airside Departure Areas				
Departure Lounges	318.4	584.0	696.0	696.0
Concessions	75.6	189.0	259.6	330.8
Washrooms	40.0	40.0	40.0	40.0
Sub Total - Airside Departure Areas	***434.0***	***813.0***	***995.6***	***1066.8***
Arrivals & Baggage				
Baggage Claim Device (domestic)	21.0	99.6	99.6	99.6
Baggage Claim Area (domestic)	35.0	166.0	166.0	166.0
Baggage Claim Device (int'l)	113.4	113.4	113.4	113.4
Baggage Claim Area (int'l)	141.8	141.8	141.8	141.8

Terminal Elements	Current TPHP 157 , LOS=C	Short-Term TPHP 253 , LOS=C	Medium-Term TPHP 276 , LOS=C	Long-Term TPHP 290 , LOS=C
Common Use Baggage Areas	282.0	282.0	282.0	282.0
Concessions	10.8	27.0	37.1	47.3
Telephones	2.0	2.0	2.0	2.0
Washrooms	20.0	20.0	20.0	20.0
Car Rental Counters	20.0	20.0	20.0	20.0
Sub Total - Arrivals & Baggage Areas	***646.0***	***871.8***	***881.9***	***892.1***
Government Inspection				
Customs Queue	189.0	189.0	189.0	189.0
Immigration Inspection	19.8	19.8	19.8	19.8
Baggage Inspection	85.2	85.2	85.2	85.2
Customs Office and Lunchroom	48.4	48.4	48.4	48.4
Washrooms	20.0	20.0	20.0	20.0
Customs Detention	25.0	25.0	25.0	25.0
Sub Total - Government Inspection	***387.4***	***387.4***	***387.4***	***387.4***
Administration				
Meeting Room, Washrooms and ECC	15.0	15.0	15.0	15.0
General Storage	40.0	40.0	40.0	40.0
Kitchen/Coffee Area	15.0	15.0	15.0	15.0
Subtotal - Administration	***70.0***	***70.0***	***70.0***	***70.0***
SUBTOTAL	***2602.5***	***3654.0***	***3959.6***	***4170.4***
Building Services, Equipment & Other	574.1	750.2	884.6	922.8
SUBTOTAL	***3123.0***	***4402.2***	***4844.2***	***5093.2***
Circulation Allowance	936.9	1350.3	1592.3	1661.0
TOTAL	***4059.9***	***5754.5***	***6436.5***	***6754.2***



WINDSOR AIRPORT MASTER PLAN

FIGURE 5-1 - CURRENT APRON MANAGEMENT PLAN

Notes

1. Conceptual Layout
2. All dimensions approximate

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

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Base data provided by City of Windsor Official Plan
Map created by EDH
Map checked by RAM

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Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

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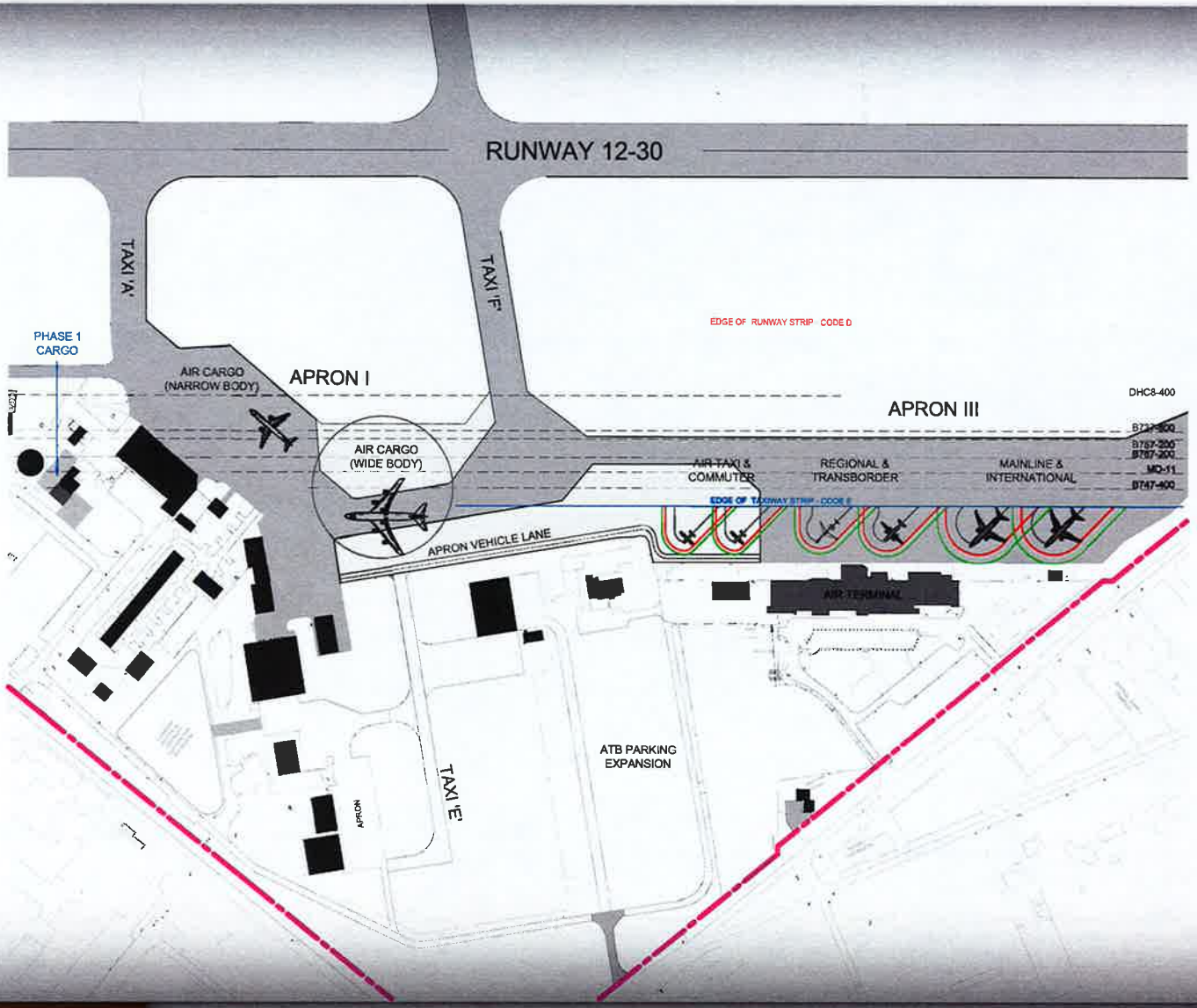

WINDSOR AIRPORT MASTER PLAN

FIGURE 5-2 - APRON EXPANSION

Notes

1. Conceptual Layout
2. Development areas may be subject to restrictions
3. Scale is approximate and for planning purposes only

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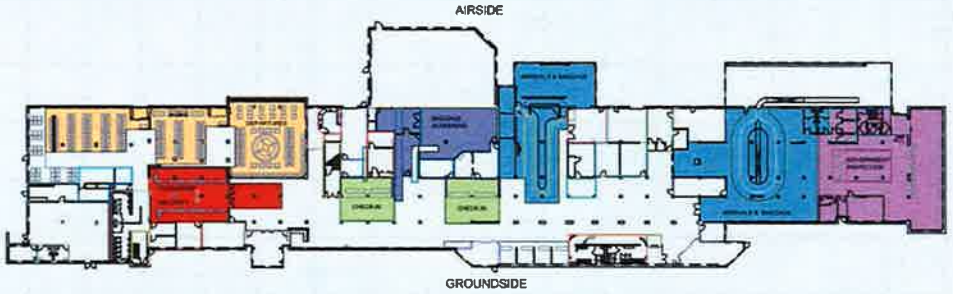
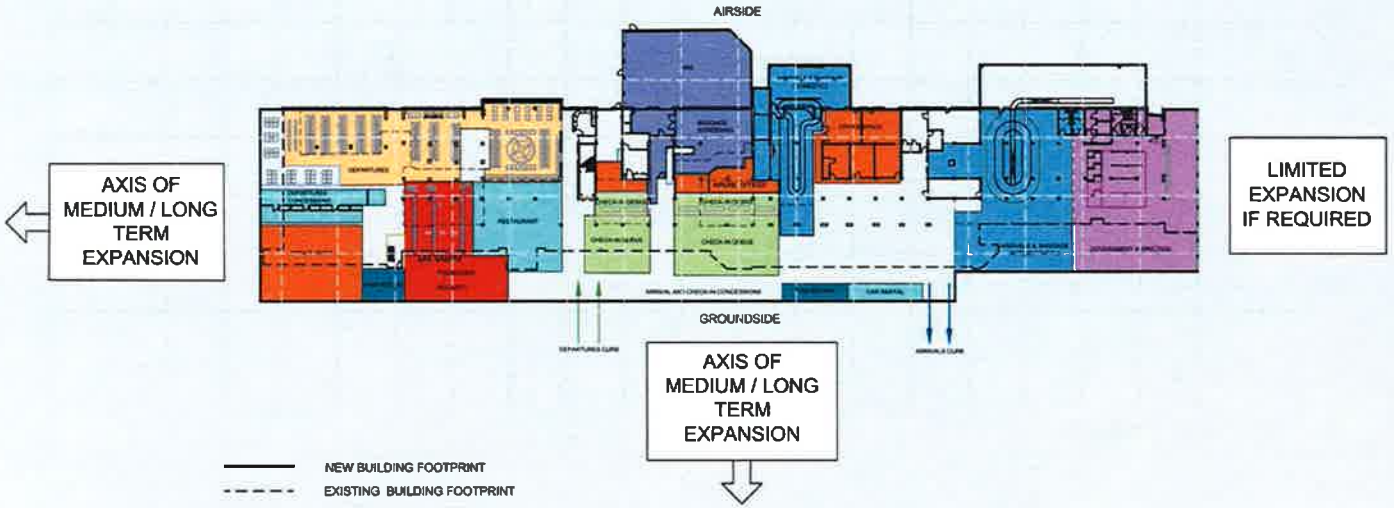
CURRENT



SHORT TERM



WINDSOR AIRPORT MASTER PLAN

FIGURE 5-3 - CURRENT TERMINAL FLOOR PLAN

CHECK-IN AREAS	AIRSIDE DEPARTURE AREAS	CONCESSIONS AND RESTAURANT
BAGGAGE SCREENING	ARRIVALS AND BAGGAGE	WASHROOMS
PASSENGER SECURITY	GOVERNMENT INSPECTION	OFFICE SPACE

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Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

5.4 Access Roads and Parking

5.4.1 Access Roads

Terminal Crescent is a private groundside access road that serves the Air Terminal Building, as well as the Airport tenant facilities. Donlon Way is a private airside access road that serves as access to navigational aids adjacent to the two runways.

The main public groundside road that serves the Airport, including the ATB is County Road 42, located along the south side of the Airport perimeter.

Additional private groundside roads serving the general aviation, maintenance and manufacturing areas that are located west of the ATB, include Duncan McColl, Hayes Road, Commercial Drive, Airport Road, and Phelps Drive.

Roadway improvements, including drainage and pavement restoration/resurfacing are expected to be required for all private roads in the short-term horizon, particularly for Hayes Road, Airport Road, and Commercial Drive.

5.4.2 Terminal Frontage and Parking

The entrance to the terminal is accessed via Terminal Crescent, located off of County Road 42. The terminal is fronted by a 3 lane vehicular loop to facilitate the efficient flow of automobiles. One lane is dedicated for dropping off and picking up passengers.

Designated areas are reserved for short and long-term parking, as well as car rentals. Using a common industry metric of one (1) stall per 1,000 enplaned / deplaned passengers, it is estimated that a minimum of 126 stalls are currently needed for short and long-term passenger parking.

Employee and public short-term parking is located on the southwest side of the terminal. There are approximately 67 employee parking stalls and 408 short-term and long-term public parking stalls.

Car rental services are provided by 3 companies. Two parking areas are dedicated for these services. The primary lot is located immediately east of the existing ATB, while the secondary lot is located south of County Road 42. The breakdown of parking stalls by car rental company is provided in Table 5-4.

Table 5-4 - Rental Company Parking

Car Rental Company	Number of Parking Stalls
Budget	51 (included 27 stalls on south side of Division Road)
AVIS	34
National	47

Additional parking stalls have been provided for Nav Canada (10 stalls).

5.4.3 Future Requirements

There is additional space available to the west of the short-term public and employee parking. This space is approximately 2 ha and could be utilized for additional short-term and long-term parking stalls.

Based on the common parking metric in Section 5.4.2, 525 stalls will be required for passenger parking in 20 years, if traffic grows as projected.

Travel and parking characteristics vary among Airports. For example, some Airports enjoy high demand for parking as passengers drive long distances to the Airport to fly on a specific holiday charter and park their vehicle at the Airport for the duration of the holiday. A detailed parking study would identify the travel patterns and any unique parking characteristics for the Airport. This will provide a more accurate basis for planning future parking needs. Reservation of additional lands for significant expansion of existing parking might be prudent until the results of a parking study are known.

- **It is recommended that a parking study be undertaken immediately to determine current and future demand characteristics and requirements at the Airport.**
- **It is recommended that additional lands be reserved in the general vicinity of the ATB to accommodate long-term parking growth.**

5.5 Utilities and Services

5.5.1 Water Supply

The existing Airport property is currently serviced by two watermains; one for fire protection and one for potable water. The fire main is connected from an existing 400mm diameter watermain at Airport Road, while the potable water supply is connected from an existing 150mm diameter watermain on County Road 42. Water supply is provided by the Windsor Utilities Commission (WUC).

The WUC Windsor Water System Master Plan, October 2009, identified the need to construct a trunk watermain along County Road 42 across the frontage of the Airport lands by 2013. This watermain system expansion would consist of a 900mm diameter trunk watermain west of the 9th Concession Road, and a 750mm diameter trunk watermain east of the 9th Concession Road.

Until such time as the water distribution system is expanded, there will be a need to confirm the ability of the existing system to meet the water consumption and fire protection requirements as each development proposal within the Airport lands is identified.

- **It is recommended an assessment of the Airport's existing on-site water distribution system be carried out to identify opportunities to modify/expand the existing system.**

5.5.2 Sanitary Sewerage

The existing Airport property has an internal sanitary sewer system that includes a 200mm diameter gravity sewer collection system that directs wastewater to an on-site pump station. A 150mm diameter forcemain discharge from this pump station directs wastewater to the City of Windsor collection system on Airport Road.

The City of Windsor has recently completed the installation of a trunk sanitary sewer to service the Sandwich South Planning District, including a portion of the Airport lands. The 1200mm and 1350mm diameter trunk sanitary sewer system is located along County Road 42 in an easement on the Airport lands, east of the 8th Concession Road.

Approximately 205 hectares of the Airport property has been allocated capacity within this trunk sanitary sewer system based on industrial sewage generation rates. The balance of the Airport lands is allocated to the existing sanitary collection system on Walker Road and Wheelton Road. The sanitary drainage area plan for the Airport lands is illustrated in Figure 5-4.

Depending on the nature of development within the Airport lands, opportunities may exist to adjust the drainage area boundary for the trunk sanitary sewer system on County Road 42 based on the proposed land uses and the corresponding sewage generation rates relative to the trunk sanitary sewer capacity.

5.5.3 Stormwater Drainage

The Airport lands are primarily located within the Little River watershed. Storm drainage on the Airport lands is currently being collected by five municipal drains, two of which originate on the Airport lands. The existing Airport pavements and facilities are primarily served by the Lappan Drain, while the Russette Drain serves a smaller portion of the existing pavement surfaces through a network of local enclosed storm sewers and surface drainage features.

To accommodate future development on the Airport lands, there will be a need to relocate and enclose a portion of these existing open drains to align with the proposed road networks and land use needs. These drainage improvements will have varying impacts based on the respective drain classifications, as established by the Department of Fisheries and Oceans (DFO).

The existing open drains on the Airport lands have all been identified as containing aquatic Species at Risk (SAR). As a result, any drain relocation or infilling requires further assessment to confirm whether the works are deemed a Harmful Alteration, Disruption of Destruction (HADD) of fish habitat. In those cases where a HADD is unavoidable, appropriate measures must be identified in consultation with DFO, MNR and ERCA to adequately compensate for those impacts.

In addition, stormwater management measures would be required to address both the quantity and quality of stormwater runoff. In particular, glycol that is used during de-icing operations must be adequately managed and contained within designated de-icing areas in order to limit any downstream impacts to existing watercourses.

In addition, the existing woodlots on the Airport lands have been identified as Provincially Significant Wetlands (PSW).

Several biological inventories of the woodlot and open drain areas on the Airport lands have been completed.

- **It is recommended that these environmental studies be updated and compiled in a more comprehensive biological inventory for flora, fauna and aquatic species.**

If the presence of aquatic SAR is confirmed in the existing open drains, it will be necessary to provide compensation measures for any impacts.

The woodlots and associated buffer areas will be protected within a comprehensive Environmental and Stormwater Management Reserve. The reserve will also provide an opportunity to provide appropriate compensation measures.

Stormwater management, including both quality and quantity controls, will be necessary for any proposed development on the Airport lands to lessen the impacts on Little River. Due to the sensitivity of wild life on airfields such as birds and water fowl, any proposed stormwater management system must achieve these objectives without having any permanent water pool for an extended period of time to deter the congregation of water fowl. A heavily planted/wooded wetland within the environmental reserve lands would not only provide SWM measures, but also provide linkage between the PSW's. Any proposed work shall maintain a minimum of a 120m setback from the PSW's.

- **It is also recommended that a comprehensive functional stormwater management study be completed to identify an appropriate strategy for implementing the necessary runoff control and mitigating measures for the development of these lands.**

5.6 Electrical and Communications

Most of the Airport property lies within the Hydro One distribution area with the exception of a small area at the northwest corner of the site which lies within Enwin's distribution area.

Hydro One has indicated that its existing system currently has excess capacity to service any potential development and would be highly dependent on the type of development. Hydro One does have the ability to accommodate any potential high power consumers on the Airport lands provided that sufficient time is allowed for the planning, design and construction of any required plant.

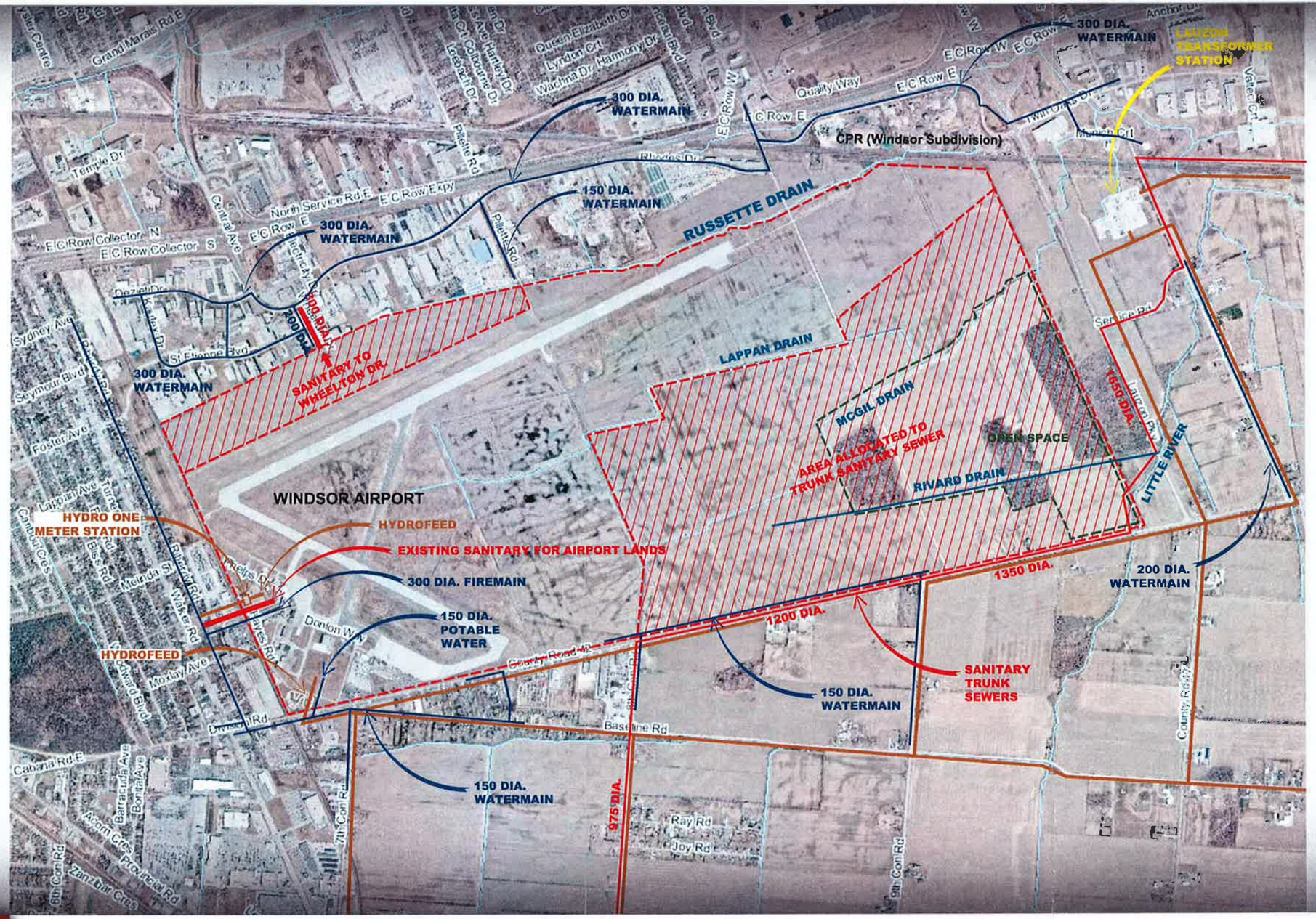
The site is also within Bell Canada and Cogeco Cable distribution area for telephone, internet and cable TV servicing.

5.6.1 Airfield

The current electrical installations are reported to be adequate to support the present runway configuration and operations.

As future changes, additions and upgrades are completed on the airfield infrastructure, the airfield lighting and other electrical components will need to be updated accordingly. This should be achievable without major operational disturbances.

As changes are made to the taxiway and runway system, upgrades to the airfield lighting will be required. As green technology becomes a major focus at airports around the world, energy efficient lighting systems for taxiways, runways and aprons (such as LED lighting) are increasingly popular. These energy efficient lighting solutions are becoming more and more recognized and some are available for use at certified Airports.



WINDSOR AIRPORT MASTER PLAN

FIGURE 5-4 - EXISTING SERVICING EXTERNAL

WATERMAIN
SANITARY SEWER
MUNICIPAL DRAINS
POWER DISTRIBUTION

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

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Base data provided by City of Windsor Official Plan
Map created by DAM
Map checked by PMM/FRF

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

N W E S

Notes:
1. Conceptual Layout

5.6.2 Air Terminal

The ATB is currently serviced with hydro supplied from Hydro One's power distribution system on County Road 42.

Bell Canada also indicated that its service to the existing ATB is from its existing plant on County Road 42.

5.6.3 Field Electric Centre (FEC)

The FEC supports all airfield power requirements. It is currently reported to be operating well with additional capacity available.

The expected life of certain equipment and components which are understood to be aging must be assessed.

- **It is recommended that an engineering study be undertaken in the short-term to assess the existing systems, equipment and components in the FEC and to determine the life expectancy of the facility.**

5.6.4 Supply and Distribution

The Airport's electrical servicing is currently provided at two points, one from Airport Road from the Enwin distribution system and the other from County Road 42 from the Hydro One distribution system. Although the source of power is from Enwin at Airport Road, Hydro One indicated that all existing power users on the Airport property have accounts with Hydro One. Hydro One has a meter station at the point of where the power distribution system crosses the Airport property line on Airport Road from Enwin.

Hydro One has suggested that any power supply requirements associated with new development be confirmed as early as possible in order that this capacity may be reserved within their Lauzon Transformer Station, located to the east of the Airport lands.

The Airport is also protected in the event of a power failure by a standby diesel generator, which restores power through an automatic transfer panel.

5.6.5 Telecommunications

Both Bell Canada and Cogeco Cable have indicated that their existing plant on County Road 42 could readily accommodate the servicing requirements for future development within the Airport lands.

Bell Canada has indicated that its plant on County Road 42 is scheduled to be upgraded in the short-term to accommodate other developments in the area, while Cogeco Cable has indicated that its existing plant on County Road 42 consists of a fibre optic cable with excess capacity.

5.7 Aircraft Services

5.7.1 Fuel Facilities

Two types of aviation fuel are available: Jet A-1 and 100 Low-Lead (Avgas). Both types of fuel are provided through dispensers and fuel trucks (bowsers) upon request.

Aviation fuel is provided by an Esso-branded dealer that leases a below grade, fuel tank farm (two tanks) to Great Lakes Flight Centre. Airport FBOs draw fuel from this fuel farm. Each tank has a capacity of up to 50,000 litres. The tanks were installed in 1989 and have a lifespan of 30 years. Consequently, replacement of both tanks will be required in approximately 9 years, at the end of the short-term planning horizon.

The tank owner may wish to replace the tanks in their current location or install above ground tanks. If the current site is unsuitable for above ground tanks, the Airport may wish to designate an alternate area for bulk fuel storage.

One possible alternate location for bulk fuel storage could be on a lot in the employment lands, located at the west end of Phelps Drive. This site would permit both airside and/or groundside access for fuel tankers with minimal disruption to Airport operations.

- **It is recommended that an environmental site assessment study be undertaken to establish appropriate locations for a bulk fuel storage facility.**

5.7.2 De-icing Facilities

Currently, de-icing is performed on an ad-hoc basis, as requested by the airlines or private aircraft users. Several companies carry out this service using large dispensing trucks. These operations are currently conducted on Apron III, where de-icing chemicals can be contained.

As large aircraft traffic increases, a designated de-icing area could be established on Apron III. With a designated de-icing area, environmental mitigation measures can be more readily implemented such as a runoff collection tank or a vacuum truck operation. The runoff from the glycol used for de-icing, as well as snow and rain can then potentially be filtered and recycled.

- **It is recommended that a designated de-icing area be established on Apron III as operations increase in the future.**

5.8 Emergency Response

5.8.1 Current Services

Emergency Response Services (ERS) at the Windsor International Airport are provided by the City of Windsor. Response staff are located at the Airport in the event of an aircraft emergency, and additional support is provided by the City's Emergency Services Department, when necessary.

The Airport publishes ERS service levels within the Canada Flight Supplement and is required to provide these published services by the Canadian Aviation Regulations (CARs). The level of ERS is categorized at designated certified Airports according to aircraft size and fuselage width. In general, Airports with annual passenger volumes greater than 180,000 are required to provide ERS. Although the Windsor International Airport only processed 122,800 annual passengers in 2009, the Airport provides ERS. The ERS categories are provided Table 5-5.

Table 5-5 – Airport ERS Categories

Aircraft Category	Aircraft Length	Fuselage Width	Example Aircraft Types
1	Less than 9m	2m	PA-44, C206
2	At least 9m but less than 12m	2m	PC-6, BE58, C441
3	At least 12m but less than 18m	3m	BE20, B1900D, SW4
4	At least 18m but less than 24m	4m	ATR42, DH8A
5	At least 24m but less than 28m	4m	ATR72, DH8C, CRJ-200
6	At least 28m but less than 39m	5m	DH8D, EMB190, A319, A320-200,
7	At least 39m but less than 49m	5m	B737-800/900, B757-200
8	At least 49m but less than 61m	7m	B767-300, A330-200
9	At least 61m but less than 76m	7m	A330-300, A340-200, B777-300, B747-400

Source: Canadian Aviation Regulations (CARs), Section 303

ERS Category 3, 4, 5 and 6 are provided upon request at the Airport between the hours of 1100 and 0500 UTC on a daily basis for all scheduled and non-scheduled arrivals and departures with 3 hour prior notice.

5.8.2 Current Facilities

ERS are located at the Airport fire hall, co-located with the Airport maintenance building. The facility houses ERS equipment within the airside area of the Airport for expedient response times in the event of an emergency. While the building is reported to be in

good condition by users and supports the needs of the Airport at current levels, Airport management has expressed concern with the age of the building and expansion ability.

The Airport operates two ERS vehicles capable of dispensing water, foam and dry chemicals. One vehicle is capable of holding 6,000 litres of water, and 757 litres of foam, while the second vehicle carries 2,500 litres of water, 77 litres of foam, and 205 kg of dry chemical.

Based on the current ERS vehicle inventory, the Airport meets the requirements for Category 5 response protection but on a limited basis, provide a Category 6, when requested.

5.8.3 Future Requirements

Current ERS levels at Windsor International Airport are capable of supporting increased scheduled passenger traffic, provided that the traffic consists of similar aircraft types currently being operated. If the number of annual passengers exceeds 180,000 and scheduled aircraft sizes increase to a larger category, additional vehicles and personnel will be required.

A larger fire truck would likely be required if operations by aircraft in ERS Category 6 were to occur on a frequent, sustained and regular basis.

5.9 Airport Maintenance

5.9.1 Services

Windsor International Airport currently offers comprehensive airside maintenance services. A Snow and Ice Control Plan has been developed for winter operations. All staff members are briefed on this plan annually in order to maintain an optimal winter level of service.

Maintenance services are available for runway evaluation including Load Bearing Surface Evaluations and Friction Measurements. These services are executed by members of the Airport staff on a daily and as required basis.

Additional maintenance services include, but are not limited to:

- Safety Inspections;
- Wildlife Management;
- Fence Maintenance;
- Groundside and Airside Pavement Maintenance; and
- Exterior and Interior Building Maintenance.

Aesthetic services such as grass cutting and gardening are performed by Airport staff and are completed on a routine, seasonal and as required basis.

5.9.2 Facilities

The main Airport maintenance garage is approximately 15,000m^2 in area and houses equipment such as snow blowers, sweepers, lawn mowers, and related storage. The garage is attached to the fire hall, directly adjacent to Apron I. The sand shed is also located in the area of the maintenance garage. Vehicle access to the garage is provided at the end of the east side of Airport Road.

5.9.3 Future Requirements

Based on the growth forecast for airside traffic, and the surface areas currently being maintained year round, a substantial increase in maintenance facilities or services is needed during the planning horizon.

The existing facility is aging and there are constraints to further building expansions. Furthermore, this facility is located adjacent to an existing apron area, which could better serve a higher and better use as a cargo operations site, or other uses requiring airside access.

- **It is recommended that as airport maintenance requirements increase that consideration be given to constructing a new maintenance building at an alternate location, including consideration for combining this with emergency response services.**

5.10 Environmental

5.10.1 Environmental Concerns

The Annexed Lands Master Plan Study investigated the main natural features in the Sandwich South Planning District, including the Airport Woodlands ESA #39 (Jefferson Woodlot, Shooting Range Woodlot, East Perimeter Woodlot and St. Louis Woodlot) located within and directly adjacent to the Airport lands and the Sundrop Bend ESA # 40 (Little River Corridor) that runs from north to south in the eastern area of the annexed land. The Airport Woodlands cover approximately 40 hectares.

The report concluded that the three woodlots located at the Airport Woodlands meet the minimum size to be considered significant by the Province, City of Windsor and Essex Region Conservation Authority. The woodlots act as a core natural area and are connected to one another by drainage ditches which provide linkages for the movement of several species. They also function as a migratory stop over location for many migrants and raptors species.

In addition, the Master Plan report concluded that the diversity of the woodlots is relatively low but when considered with vegetation in the Little River Corridor and connecting drainage ditches, there is a substantial diversity of plant communities overall. The report stated that protection / recreation of natural habitat on both sides of the Little River would help improve the habitats and hydrologic conditions in the watershed. The development of pedestrian and cycling trails (separated where possible) along the Little River Corridor is also recommended. This would allow for the extension and continuation of existing recreational trail systems in Windsor and facilitate the use of alternative modes of transportation.

In July 2008, the Essex Region Conservation Authority completed an Update to the CNHS Inventory as part of the City of Windsor Official Plan Review (CNHS stands for Candidate Natural Heritage Site). The study used 10 evaluation criteria to evaluate 18 natural heritage sites in the City to determine if the sites are considered "significant" under the Provincial standards. The Airport Woodlands were considered as Provincially Significant as they fulfilled the following four out of ten evaluation criteria:

- Significant Woodland: The three woodlots meet the minimum size (2 hectares) for being considered significant by the Province, City of Windsor and Essex Region Conservation Authority;
- Ecological Function: The woodlots increase the linkage provided by the Little River Corridor and contributes to the hydrological flow of the watercourse;
- Diversity: The woodlots present a diversity of plant communities and also aquatic communities in the linking agricultural drain and the adjacent Little River; and
- Significant Species: Eleven significant plant species were observed. No significant faunal species were observed.

Outside of the Airport lands and the Little River Corridor, there are no significant Natural Heritage Features located within the Sandwich South Planning Area that will be negatively impacted as a result of future development in the area. Area natural features can be protected and potentially enhanced through the Master Plan/Secondary Plan and Site Plan processes.

5.10.2 Constraints to Development

The Update to the CNHS Inventory report states that because of the danger of collision with aircraft, large bodied wildlife is discouraged from inhabiting the Airport Woodlots with the exception of Red-tailed Hawk and Great Horned Owl which are allowed to remain and control other animals. The woodlots should be considered in relation to aircraft movements since they are close to the main runway, as well as to other transportation corridors in the area.

The Airport Woodlots should be protected as Natural Heritage Areas in their entirety. Provincial legislation requires that significant features be protected over the long-term. Land development proposals must address compatibility with significant features. A buffer of 50 metres may be appropriate.

The size and location of the woodlots may constrain site design flexibility for potential industrial users on the Airport lands. In addition, any development adjacent to the Little River Corridor may require a detailed assessment to determine the need for bird studies and Fisheries Act approval. Compensation plans or restrictions on the timing of work are needed to ensure that fish habitat is not disrupted.

Schedule C: Development Constraints and Schedule D: Land Use, in the Windsor Official Plan, designate the Airport Woodlots as "Natural Heritage". (See Figures 2-3 in Chapter 2 and Figure 5-5 in next page).

These lands are Windsor's most environmental significant and sensitive natural areas. Policies in the Plan provide for their protection and conservation. Uses permitted in the "Natural Heritage" areas are natural reserves and wetland management. In addition, Council may permit ancillary recreation and leisure activities and facilities, provided that the ancillary use is incidental and secondary to, or complementary with the Natural Heritage use. The ancillary use must not negatively impact the site's natural features and functions.

To protect lands designated "Natural Heritage" lands, proponents of developments in adjacent areas may be required to complete an Environmental Evaluation Report or other study in accordance with the policies in the Official Plan.

The area adjacent to the Airport Woodlots and the Little River Corridor are designated as "Open Space" in the Official Plan Schedule D: Land Use. Uses permitted in the Open Space land use designation include recreation and leisure areas and facilities. Council may also permit ancillary residential, commercial or institutional in areas designated "Open Space" provided that the ancillary use is incidental and secondary to and complementary with, the main Open Space use. Development must conform to the Plan's policies for the proposed land use.

In addition, the Little River Corridor is identified as an "Environmental Policy Area". The Official Plan defines Environmental Policy Area (EPA) as "an environmental significant and/or sensitive natural area which may be able to tolerate appropriately designed development". EPAs are further classified as A or B. EPA A may be partially developed only when development provides for conservation of the significant natural features and/or functions. EPA B may be developed provided significant natural features are incorporated into the development.

Proponents of development or infrastructure undertakings within an Environmental Policy Area A or B are required to complete an Environmental Evaluation Report or other suitable study in accordance with Official Plan policies.

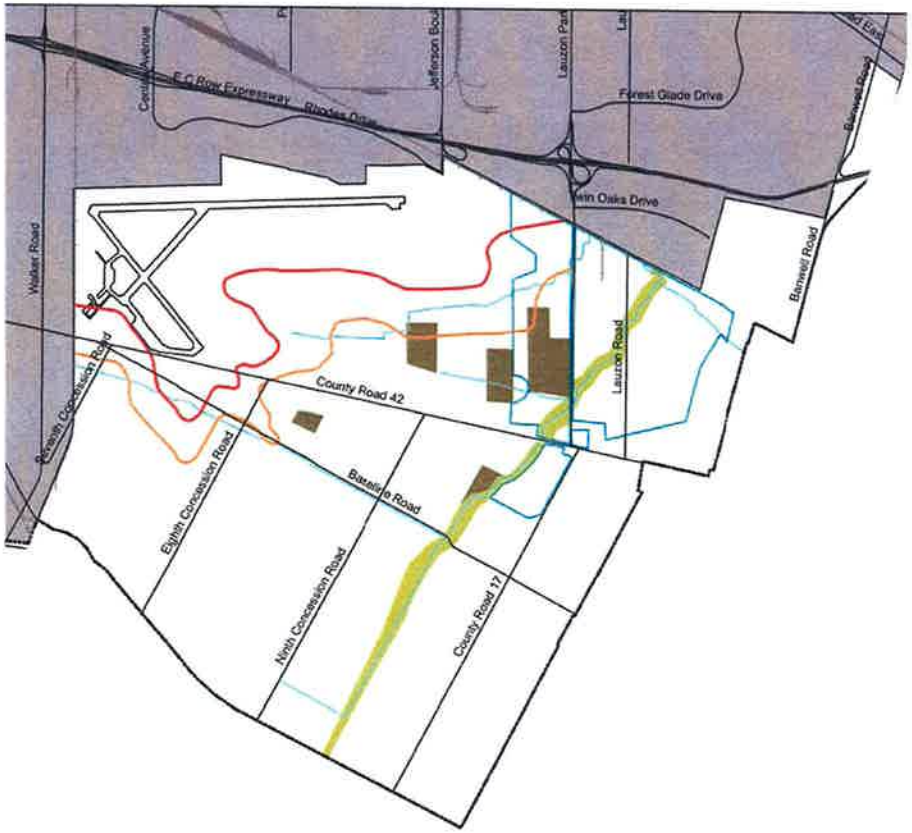
5.10.3 Impact of Development Plan

The Airport Master Plan considered the conservation and management of the woodlots located within the Airport lands. To minimize the impact of development on the woodlots, a significant area surrounding them has been zoned as "Environmental Reserve" in the Development Plan Concept. The Environmental Reserve incorporates a minimum buffer of 120 metres adjacent to the existing woodlots, while also allowing for the potential to include stormwater management facilities and measures to compensate for impacts to fish habitat associated with drainage improvements within classified watercourses.

AMENDMENTS TO

SCHEDULE C : DEVELOPMENT CONSTRAINTS

OFFICIAL PLAN AMENDMENT #60



WINDSOR AIRPORT
MASTER PLAN

FIGURE 5-5 - DEVELOPMENT CONSTRAINTS

ENVIRONMENTAL POLICY AREAS

NATURAL HERITAGE

WATERWAY CORRIDORS

30
25 NOISE EXPOSURE FORECAST

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by Alana Evers
Map checked by Karl Tanner

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File Location: \\dillon.ca\DILLON_DFS\Oakville\V:\PROJECTS\DRAFT\2009\09-2665 Windsor Airport\09-2665 Graphics

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

6.1 Current Inventory

Airport related general aviation activity is concentrated in the southwest quadrant of the Airport site. Key businesses are identified as follows:

Air-Way Aviation provides ground handling, aircraft de-icing, cargo handling, and other aviation support services to air carriers and aircraft operators. Air-Way Aviation was established in Windsor in 1988 and its business is primarily driven by passenger and air cargo volumes at the Airport.

Canadian Historical Aircraft Association is a charitable, non-profit organization that restores vintage aircraft significant to Canadian aviation history. The Association operates from a World War II vintage hangar at the Airport, and has up to 200 active members who are involved in several aircraft restoration projects.

Eagle Air Services provides ad-hoc charter air services to various destinations.

Great Lakes Flight Centre / Journey Air provides aviation fuel services, flight training and ad-hoc air charter services. The Great Lakes Flight Centre branch provides services typical to a Fixed Base Operator (FBO). Great Lakes / Journey Air have a total of six aircraft ranging from C152 to C172 and Piper Seneca types. It leases administrative space and a 10,000 square foot hangar.

Mara-Tech Aviation provides ground handling, de-icing and other aircraft support services. Mara-Tech provides ground handling services for Jazz's DHC8 Windsor to Toronto service, sports team charters, corporate aircraft and other itinerant aircraft operators at the Windsor International Airport. Mara-Tech's facilities are located inside the Air Terminal Building. The organization also leases aircraft equipment parking space outside the Air Terminal as part of its lease agreement.

Windsor Flying Club operates a clubhouse complete with classrooms and offices, and several small General Aviation hangars at the Windsor International Airport. The Flying Club is home to approximately 275 members and specializes in flight training, aircraft charters, and a scheduled air cargo service to Pelee Island for Canada Post.

WCS Aviation is an aircraft maintenance organization specializing in service and maintenance of general aviation and other small aircraft. WCS is located near the Windsor Flying Club and is the only licensed aircraft maintenance organization at Windsor International Airport.

Air Terminal: Several Airport related businesses are also located in the Air Terminal Building to serve passengers, visitors and Airport staff. Businesses include National Car Rental/Alamo, Budget/Avis Rent a Car and a canteen serving sandwiches, drinks and other snack foods. Wizie, Inc. provides data management, travel booking engines and travel technology services from the second floor of the Air Terminal Building.

Private: Windsor International Airport holds lease agreements with other entities including private aircraft hangars operated by local businesses.

The Airport also leases land for farming purposes as an added source of outside revenue.

6.2 Air Cargo

Air Cargo is typically provided at Airports using dedicated all-cargo aircraft, and/or utilizing spare hold capacity on scheduled passenger air services. Limited air cargo activity is currently occurring at the Airport, primarily using all-cargo aircraft:

- The Windsor Flying Club operates a scheduled air cargo service on behalf of Canada Post to Pelee Island.
- The regional size scheduled aircraft serving the Airport offer modest capacity for transport cargo.
- Ad-hoc air cargo services operate at the Windsor International Airport on an occasional basis, primarily supporting the automotive industry.

Consultations have indicated that cargo volumes have been declining, likely due to a decrease in demand from the automotive industry and regional economic fluctuations.

The City of Windsor commissioned a Feasibility Study for Air Cargo Development at Windsor International Airport from Lufthansa Consulting. The Phase 1: Market Potential Analysis Report (September 4, 2009) projects that average air cargo will grow by 28.17% over 25 years in the Most Likely Scenario. From the current level of 161 tonnes in 2009, air cargo is projected to grow to:

Optimistic Scenario = 90,713 tonnes (2034);

Most Likely Scenario = 79,708 tonnes (2034); and

Conservative Scenario = 59,349 tonnes (2034).

- **Lufthansa Consulting has recommended (April 8, 2010) development of air cargo facilities in two (2) phases along with a Cargo Village as summarized in Table 6-1.**

A subsequent study by Lufthansa Consulting (Fall 2010) estimated the size of the facility and land area required for a dedicated air cargo terminal. These requirements are shown on Table 6-2, for the Most Likely Scenario.

Table 6-1 – Phased Cargo Terminal Development

Year	Tonnage	Terminal Floor Space	Landside Area	Airside Area	Total Footprint	Comments
Immediate Phase 1		180 sm	525 sm	540 sm	1,245 sm	Existing cold storage warehouse to be converted, airside access to aprons required.
2034 (Phase 2)	80,000	30,000 sm		15,000 sm	45,000 sm	Central facility, 2 Code F aircraft (A380), building height 16.0m.

Source: Lufthansa Consulting, April 2010

Table 6-2 – Air Cargo Facility Requirements

Year	Tonnage	Terminal Floor Space	Approx. Site Requirements	Comments
2017 (Phase 1)	35,283	5,400 sm	13,000 sm	Focal point for all air cargo business at YQG. Cater to requirements of general and special cargo (flown and trucked). Approximately 77% of freight to be trucked. Maximum size of aircraft Code E.
2022 (Phase 2)	54,999	7,560 sm	18,000 sm	
2034 (Phase 3)	79,708	9,720 sm	23,000 sm	

Source: Lufthansa Consulting, July 2010

Following the assessment of alternative sites, a site for immediate development of a dedicated air cargo capability was selected in the vicinity of the existing Airport maintenance building. Development involves the conversion of an existing warehouse and airside access using existing aprons and vehicle lanes. The facilities can be made secure.

As cargo traffic grows, a dedicated air cargo facility can be developed on the north land employment area, north of Runway 07-25 accessed by a new taxiway constructed from the threshold of Runway 07. Located within the security perimeter, this area has convenient access to local and regional road networks, as well as potential airside access for vehicles to Aprons I and III. Airside access could be enhanced by construction of an airside service road linking Aprons I and III with the north employment lands.

- **It is recommended that an airside service road be constructed linking Apron III to Apron I, and Apron I to the north employment lands as required to support air cargo facilities development.**

6.3 Cargo Village

The Market Potential Analysis for Windsor International Airport report by Lufthansa Consulting states: *"The medium to long-term objective should be to plan, design and develop a Cargo Village at YQG that will become a multi-modal gateway, incorporating Airport and surrounding industrial areas, together with rail links and trucking facilities, to attract, bundle and channel the international movement of cargo to and from points in North America".*

A Cargo Village will accommodate cargo / logistics related facilities such as forwarder buildings, facilities for logistics service providers, distribution, processing, warehousing and assembly. It will be integrated with or have dedicated access to the cargo terminal and would be integrated with vital Airport functions.

It will require a secured access from public roads, an efficient internal road circulation system and require a proper technical infrastructure to support operations.

- **Development of a Cargo Village has been recommended by Lufthansa Consulting.**

Lufthansa Consulting has recommended a footprint size of approximately 20 to 25 acres to accommodate a zoned development for small, medium, and large cargo logistics businesses. Part of this area would have apron access.

The Master Plan has provided for a Cargo Village on the employment lands. These lands have suitable airside and groundside access at various locations.

6.4 Multi-modal Port

LPS AVIA undertook a Multi-modal Port Land Reserve Study (January 2010) to assess opportunities for developing a multi-modal port.

The study examined the opportunities and constraints of establishing and operating land-rail-air ports including the most common types of truck-truck, truck-air, and truck-rail operations.

The study included a survey of nine multi-modal ports in North America and Europe and a detailed case study of the Huntsville, Alabama multi-modal port based on similarities to Windsor International Airport. An Inland Port for rail was also considered based on a case study of the Virginia Inland Port.

Three Airport Land Reserve Options were developed potentially utilizing available employment lands at Windsor International Airport. These featured air, truck and rail access. The three options ranged from 100 ha. to 360 ha. in size and could be developed and accommodated on existing Airport lands.

- **It is recommended that lands be reserved for a multi-modal port with a configuration of roughly 235 ha.**

The Multi-modal Port – Land Use Options Report is included as an Annex to the Windsor International Airport Master Plan.

6.5 Pre-Clearance Centre

Development of a pre-clearance centre has been proposed by Lufthansa Consulting. This facility would permit pre-clearance of cargo destined for the United States and, once cleared would be trucked or flown non-stop to U.S. destinations.

A pre-clearance facility could be located in or adjacent to the air cargo building. If it also serves truck traffic, it would need to be near in or adjacent to the Cargo Village. The limitation of a truck shipment facility is that a dedicated and secure truck corridor would be required to the U.S. border from the Airport. This was considered unlikely to be achieved within the time-frame of this Master Plan.

Sufficient land is available in the employment land area surrounding the Airport to accommodate a pre-clearance facility

6.6 Airport Business Park

Building on the Multi-modal Port Land Reserve Study, the Master Plan explored a series of options for developing a Business Park on lands surplus to the operating Airport. The options were variously configured to attract and accommodate a series of new and emerging opportunities for employment including:

- solar energy manufacturing facilities;
- major aircraft maintenance repair and overhaul (MRO) facilities;
- aerospace manufacturing facilities;
- aircraft hangars; and
- other new opportunities.

Many opportunities require specific land capabilities which must be integrated with current and future Airport operations.

A total of five land use and development options were assessed, including those prepared in the Multi-modal Port Study. A Preferred Option was then finalized (Option 5).

The recommended Development Plan identified in Chapter 7, represents the preferred strategy for flexibly accommodating the best range of future employment opportunities at the Airport.

6.7 Aircraft Maintenance and Support

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

- Maintenance Repair and Overhaul (MRO) activities, including maintenance for scheduled airlines and maintenance for corporate aircraft;
- Engine overhaul;
- General aviation aircraft inspections and routine maintenance; and
- Airframe inspections.

WCS Aviation is currently the only business offering aircraft maintenance services at the Windsor International Airport.

The Airport is pursuing new large MRO businesses as a strategic market for Windsor. The Airport is in a good position to strengthen the presence of MRO businesses due in part to the availability of skilled labour in the region, and its strategic position in North America.

The Federal Government has recently announced that funding will be provided to attract a maintenance repair and overhaul (MRO) business to the Airport. The Master Plan includes provisions to accommodate this and other large scale facilities in airside employment lands.

6.8 General Aviation

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

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

A review of historical aircraft movements in the private category suggests GA operator activity has declined slightly over the past 10 years.

The Master Plan forecasts that general aviation will grow at an average annual rate of 1.36% over the next 20 years, from some 33,000 movements to 44,000 movements per annum.

To help attract new and expanded GA operations, additional serviced development areas for General Aviation activities are included in the Development Plan. High volume flight training has also been identified as a potential opportunity for the Windsor International Airport as an example of means to increase GA activity.

Business and corporate aviation activities are generally related to the transportation of company executives or large charter groups, such as sports teams. These individuals usually own or charter an aircraft for air transportation. Consultations and analysis indicates that several tenants at the Windsor International Airport are operating within the Business and Corporate Aviation category. Consultations with an FBO operator suggest an increase in Business and Corporate Aviation activity would improve revenue streams at the Airport. This could require attracting additional industries to the Windsor-Essex region.

A limited volume of flight training is currently occurring at the Windsor International Airport, primarily through the Windsor Flying Club and Journey Air. The Windsor International Airport is well-positioned to attract additional flight training to the region. To attract this additional business, the Airport could market its extensive airside infrastructure, low levels of airside and airspace congestion, and suitable winter weather to potential flight training operators and markets. Educational facilities could be located at the Airport within the employment areas shown in the Development Plan. This could involve coordination with St. Clair College, the University of Windsor, or other post secondary institutions in Southwestern Ontario.

6.9 Airport Related Commercial Land Supply

Windsor International Airport has abundant land for Airport related development.

The Airport's current development area is concentrated within the southwest quadrant of the Airport site. Airport lands west of Runway 07 and Runway 12 are constrained by the presence of the CN Railway line. These areas are not considered suitable for future Airport development. The area to the east of Runway 25 has been identified for extension of the runway to 10,000 ft.

There is a significant land parcel of some 26.7 ha that is easily accessible from existing airside and groundside infrastructure, on the north side of the Airport property. It is subject to height and electronic zoning restrictions in certain areas.

A small parcel of land of 4.3 ha is also potentially available on the north side of Runway 07-25 at the east end.

Significant land is available within the infield area of the Airport property including more than 300 ha potentially available under various development scenarios. This land is ideal for major Airport related business and employment uses. Development of high structures in certain portions of the infield area may interfere with sight lines from the current ATC control tower. All proposed infield development projects should be subject to review by Airport management and if a sight line issue is identified, relocation of the ATC tower to a new infield location may be necessary in order for the development to proceed.

7.1 Land Assignment

The recommended Airport Land Use Plan proposed in this chapter has been prepared to address short, medium and long-term development potential.

The intent of the Land Use Plan is to identify and provide maximum flexibility in the use of Airport lands, thereby supporting broader City and Airport business objectives. The purpose of the Land Use Plan is to:

- Provide sufficient land to meet the long-term requirements of all essential aviation activities at the Airport;
- Provide flexibility to accommodate strategically targeted, opportunistic business investments;
- Ensure that land is developed for uses that are compatible with the safe and efficient operation of aircraft at the Windsor International Airport;
- Ensure that land is developed in such a way as to be compatible with adjacent Community land uses;
- Guide the development of the Airport in a logical and orderly manner ; and
- Protect the interests of all tenants within boundaries of Airport property.

The Plan provides a rational, comprehensive and flexible framework for the development and use of Airport lands, permitting the balanced fulfilment of future needs.

The order of priority used in the systematic land assignment for Airport facilities, as well as a definition of each use follows:

- **Airfield** – fixed and rotary wing manoeuvring areas, taxiways, aprons and navigational aids at the Airport.
- **Air Terminal & Operations** – air terminal building, maintenance garage, security, fuel facilities, utilities, public facilities, terminal road system and public parking.
- **Airside Employment** – general aviation facilities and aviation support functions on land requiring airside access, including air cargo, MRO and helicopter facilities.
- **Groundside Employment** – public or private concerns not requiring direct airside access. Includes Airport and non-Airport uses and will accommodate strategically targeted, opportunistic business opportunities in a Business Park environment.
- **Airport Reserve** – lands for which it is not practical to designate more specific Airport uses at this time. The lands are held in reserve in order to accommodate Natural Heritage areas and surplus areas.

7.2 Recommended Plan

The Recommended Land Use Plan for the Airport is presented as Figure 7-1.

WINDSOR AIRPORT MASTER PLAN

FIGURE 7-1 - RECOMMENDED LAND USE PLAN

- COMMUNICATIONS RESERVE
- AIRPORT EMPLOYMENT
- AIRFIELD RESERVE
- GENERAL AVIATION
- AIR TERMINAL RESERVE
- EMPLOYMENT LANDS
- AIRPORT TERMINAL BUILDING
- OPEN SPACE/NATURAL HERITAGE
- EXISTING AIRCRAFT PAVEMENT
- FUTURE AIRCRAFT PAVEMENT
- PROPOSED LAND ACQUISITIONS
- TOWER LINE OF SIGHT
- DRAIN
- EXISTING PAVEMENT (ROAD)

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

LPS AVIA CONSULTING

Base data provided by City of Windsor
Map created by Paddy Kennedy
Map checked by FRF

0 100m 500m 1km
SCALE

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

N W E S

8 Airport Infrastructure Development Plan

The Development Plan is intended to meet the current and future airside, air terminal and groundside requirements of Windsor International Airport. The plan allocates sufficient land to accommodate Airport growth beyond the planning horizon.

Development projects are identified in Table 8-1 along with the trigger points when each project will be required.

Rough order-of-magnitude cost estimates are provided for immediate and short-term projects. Several projects could be combined. Longer-term projects are not included in the capital project list as the scope will vary depending on actual growth rates experienced, and the attraction of new lines of business to the Airport.

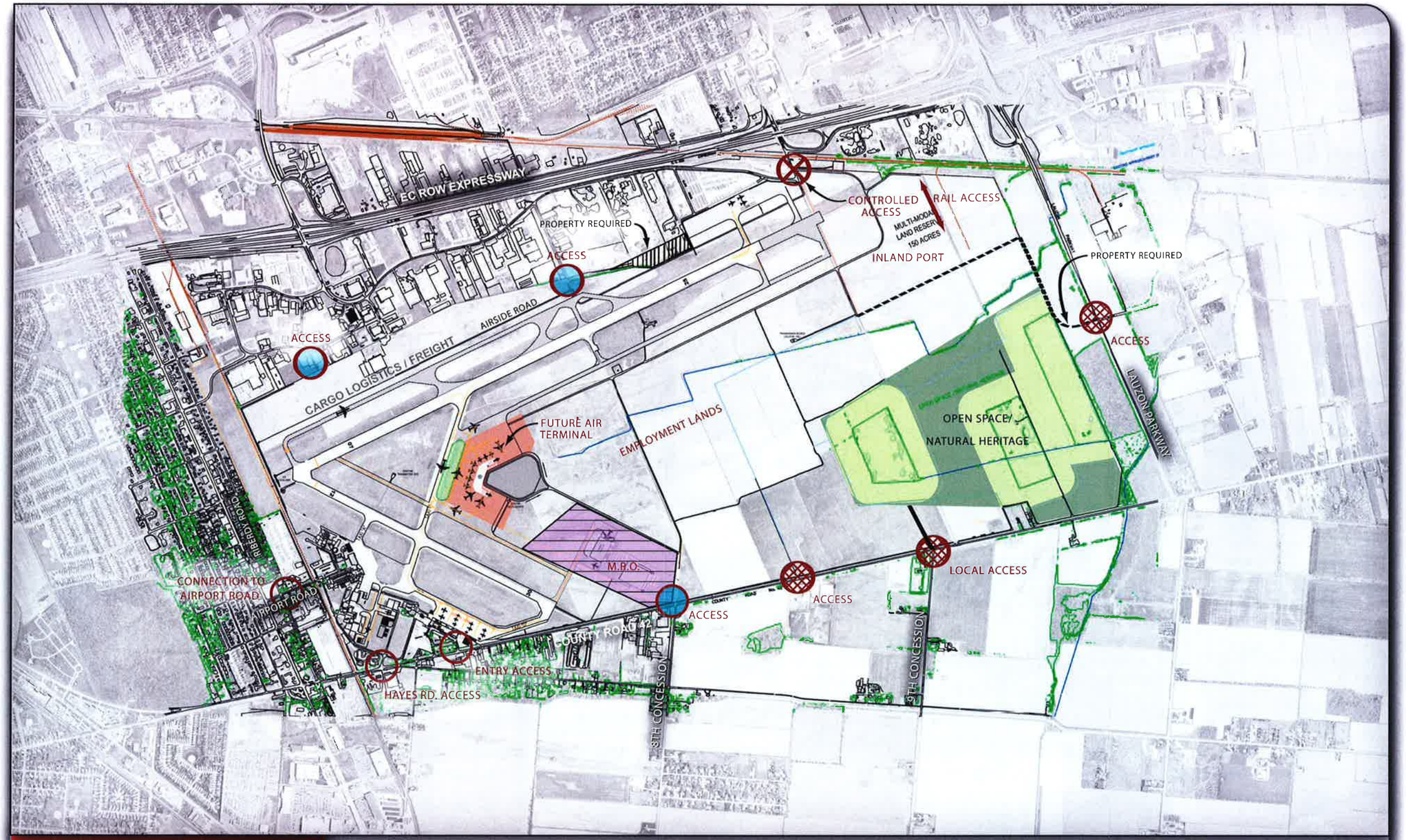
It is recommended that implementation of projects be demand driven as Airport marketing and growth objectives are achieved. The Development Plan is illustrated in Figure 8-1.

Table 8-1 – Development Plan

Project	Phasing Trigger	ROM Cost	Refer. Sect.
Airport Lands			
Construct partial parallel taxiway north of Runway 07-25.	To provide access to new north employment lands, as demand develops.	$ 10 million	5.1.2
Construct taxiway on the east side and parallel to Runway 12-30.	To provide access to the new south employment lands and access by heavy aircraft from these lands to Runway 07-25, as demand develops.	$ 3.5 million	5.1.2
Expand Apron I in the vicinity of Taxi 'G' to accommodate Code E aircraft.	To provide parking for B747-400 cargo aircraft as demand develops and Runway 12-30 requires precision approach zoning protection.	$ 2 million	5.1.3
Maintain Runways to extend the life of these assets.	Short-term repaving of Runway 12-30 (2016).	$ 1.5 million	5.1.1
Construct airside service road linking Apron III to Apron I, and Apron I to the north employment lands.	As required to support air cargo facilities developments.	$210,000	6.2
Expand ATB to approximately 5,250m^2 to provide additional space for passenger check-in queuing, international and trans-border arrivals, related amenities, and concessions.	Immediate requirement to serve current peak hour passengers (TPHP) of 157.	$2.0 million	5.3.3
Expand ATB to 5,800m^2 to meet projected growth in passenger traffic in the short-term.	Expansion anticipated in the short-term (5 years) to serve projected peak hour passenger (TPHP) growth to 253.	$2.5 million	5.3.4
Prepare engineering study of the ATB.	Prepare prior to embarking on ATB improvement programs.	$50,000	5.3.4
Complete drainage and pavement resurfacing of private groundside and airside roadways serving the Airport operations.	Short-term to medium-term need, subject to roadway conditions.	$ 1.5 million	5.4.1

Project	Phasing Trigger	ROM Cost	Refer. Sect.
Prepare Airport parking study.	Immediate requirement to determine current and future demand characteristics and requirements for parking.	$35,000	5.4.2
Prepare engineering study of the FEC.	Short-term requirement to assess the existing systems, equipment and components in the FEC and the life expectancy of the facility.	$15,000	5.6.3
Construct a new maintenance building at another location on site, including consideration for combining this with emergency response services needs.	Medium-term, as maintenance requirements increase.	$ 2.5 million	5.9.3
Develop a Secondary Plan/Official Plan Amendment to re-designate future employment area to permit employment uses including a Business Park and establish road and servicing network.	Short-term.	By City Planning & Eng. Depts.	6.6
Develop Phase I air cargo facility.	Immediate investment to foster air cargo development.	$ TBD	6.3
Develop North Side Employment Lands.	Development of Phase II air cargo facilities, or shortage of general aviation development land.	$ TBD	6.3
Develop South Side Employment Lands.	Development of large MRO and/or aerospace manufacturing on adjacent employment lands.	$ TBD	6.8
Develop Cargo Village.	Assemble as critical mass of related businesses develops on Airport lands in vicinity of each other.	$ TBD	6.3
Develop Multi-Modal Port.	Development of Multi-Modal Rail/Truck Facility.	$ TBD	6.4
Complete a stormwater management (SWM) plan for the Airport lands and implement stormwater management measures.	Immediate need for SWM Plan. Short-term to longer-term implementation of SWM facilities in stages as development proceeds.	$50,000 $15.6 million	5.5.3 and 5.10
Protect and maintain environmental sensitive area adjacent the Airport Woodlot.	Immediate to short-term.	N/A	5.5.3 and 5.10
Complete environmental studies to confirm the significance of the natural environment and mitigating measures resulting from development impacts.	Short-term.	$ TBD	5.5.3 and 5.10
Surrounding Lands			
Complete environmental assessment studies for County Road 42 and Lauzon Parkway.	Immediate.	$ TBD	2.4.2
Implement the preferred road improvement alternatives arising from the above environmental assessment studies.	Short to medium-term.	$ TBD	2.4.2
Complete traffic impact studies to confirm external roadway improvement measures to accommodate development.	Progressive studies as development opportunities arise.	$ TBD	2.4.2

Project	Phasing Trigger	ROM Cost	Refer. Sect.
Confirm existing water distribution system capacity and associated improvements in the interim until trunk feedermains are completed by WUC.	Immediate to short-term. Trunk watermain facilities from Banwell (North of EC Row) to Cabana (East of Howard).	$ 26.3 million	5.5.1
Complete a sanitary servicing study to confirm the opportunities to expand the drainage area boundary for the trunk sanitary.	Medium-term.	$ 50,000	5.5.2
Complete improvements to the Little River Pollution Control Plant, as required to meet sewage flow demands from the expanded service area.	Longer-term.	$ TBD	5.5.2



WINDSOR AIRPORT MASTER PLAN

FIGURE 8-1 - RECOMMENDED DEVELOPMENT PLAN

- CONTROLLED EXISTING ACCESS (JEFFERSON)
- EXISTING ACCESS
- FUTURE PROPOSED ACCESS
- POTENTIAL ACCESS

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

LPS AVIA CONSULTING

Base data provided by City of Windsor
Map created by Paddy Kennedy
Map checked by FRF

0 100m 500m 1km
SCALE

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

N W E S

9 Public and Agency Consultation

An Open House and Public Information Centre (PIC) was held on May 30, 2011, to provide the public and agencies with an opportunity to review and provide comments on the findings and recommendations of the Airport Master Plan. The displays from the PIC are included in Appendix F. This PIC was held for information purposes only and was not conducted as a statutory public meeting under the Planning Act.

The public was notified of this PIC through a published advertisement in the Windsor Star on Saturday, May 21, 2011, a copy of which has been included in Appendix F. Relevant agencies were directly notified of this PIC through a letter dated May 10, 2011, the distribution list and copy of which has also been included in Appendix F. The Mayor and members of City of Windsor Council were invited to attend a presentation of the Airport Master Plan in advance of the PIC.

A total of 35 attendees recorded their signatures on the PIC sign-in sheet. A total of 4 comment sheets were returned. This information has been included in Appendix F.

In addition, comments were received from two residents of Riberdy Road, copies of which have also been included in Appendix F.

In addition, several public and agency representatives requested a copy of the PIC display panels, as well as an opportunity to review the draft Airport Master Plan report. This information was provided to these stakeholders through electronic mail on June 3, 2011, with a request to return any further comments by June 24, 2011. A list of those stakeholders has been included in Appendix F.

The Essex Region Conservation Authority submitted their comments relating to permits and authorizations, stormwater management, natural heritage restoration opportunities, and source protection planning considerations in a letter dated June 21, 2011. A copy of their letter has been included in Appendix F.

In addition, the Windsor-Essex County Environment Committee (WECEC) submitted their comments in a letter dated July 9, 2011, a copy of which has also been included in Appendix F.

No further public or agency input was received.

Appendix A – Passenger Demand Forecast Methodology

Appendix A – Passenger Demand Forecast Methodology

Traffic forecasts are usually based on past history. Previous traffic volumes are examined, and related through a mathematical model to various socioeconomic variables such as GDP. Good forecasts or projections of these "explanatory" variables are usually available. When "plugged in" to the mathematical model, they generate forecasts of future activity. This process, called a "time series analysis," examines the behaviour of a single entity over a period of time.

The Airport has a limited data of scheduled services on which to develop such a model. Its services are too young to have generated any useful insights about the future. These limits call for a "cross-sectional" approach. Rather than examining previous years for the same Airport, the analysis looks at a sample of other Canadian Airports. These communities are considered "similar" to Windsor after correcting for several socioeconomic disparities. The sample excludes far northern communities and hub Airports.

The econometric model used a double-logarithm specification. Results of an ordinary least squares regression are shown in Table A-1. In some situations, the population and income statistics were consolidated for several communities located close to the Airport.

Table A-1 - Ordinary Least Squares Regression of Model

	Coefficients	Standard Error	T Statistic
Intercept	-0.27428	3.620173	-0.07576
Log of Population	0.911636	0.09977	9.137415
Log of Per Capita Income	0.284157	0.835257	0.340204

R-square 0.798021 Standard error 0.77966

Table A-2 - Analysis of Variance

	Degrees of Freedom	Sum of Squares	Mean Square	F-Statistic
Regression	2	5.122826	2.561413	43.4612
Residual	22	1.296584	0.058936	
Total	24	6.41941		

The regression shows that population is a strong predictor of traffic. Per capita personal income exercises a positive influence, but the model does not indicate statistical significance. The model as a whole shows strong explanatory power, as measured by a highly significant "F" statistic.

The r-square statistic ranges form 0 to 1. It compares the variation explained and unexplained by the model. A value close to unity indicates that the model has explained almost all of the variation in the data. A large r-square does not necessarily indicate a "good" model. Some situations are inherently subject to large random variations. A high square can always be obtained through enough manipulation of the model, but the results are then genuinely misleading.

The r-square of .798 is relatively high for a cross-sectional model. Times series based models often have r-squares exceeding .9.

The model showed distortions from heteroscedasticity, as indicated by a significant Golfeldt-Quandt statistic. Heteroscedasticity is a common problem with cross-sectional models. The linear regression algorithm can produce estimates of coefficients that have many desirable properties. However, it requires that the dispersion of the error term, either negative or positive, does not depend on the underlying "X" variables. The models developed use population, income and a regional dummy as exogenous variables. There was a fear that large, populous communities would have large negative or large positive error terms, and small communities would have small negative and small positive error terms. This property would have rendered the T and F tests invalid. Other estimation procedures could then provide coefficients with optimal properties. A weighted least squares procedure produced the following unbiased, minimum variance estimates of the coefficients:

Table A-3 - Generalized Least Squares Regression of Model

	Coefficients	Standard Error	T Statistic
Intercept	-0.27058	2.791085	-0.09695
Log of Population	0.969332	0.627322	1.545191
Log of Per Capita Income	0.293696	0.722912	0.406268

Table A-4 - Analysis of Variance

	Degrees of Freedom	Sum of Squares	Mean Square	F-Statistic
Regression	2	0.157467	0.078733	7.174185
Residual	22	0.24144	0.010975	
Total	24	0.398907		

The estimation procedures tested other potential explanatory variables, including household income, unemployment rates, regional dummy variables (e.g. a "1" if the community was in eastern Canada, otherwise a zero) and distances from a hub or international services Airport. These variables did not contribute to the explanatory power of the model.

Appendix B – Passenger Statistics and Forecasts

Table B-1 - Windsor International Airport Passenger Forecasts
(Enplaned and Deplaned Passengers)

	Current Services	WestJet	Porter	Aug-mented Charter	Air Canada	Oil Sands	Trans-border	Most Likely	Maximum
1996	180,602							180,602	180,602
1997	205,976							205,976	205,976
1998	216,675							216,675	216,675
1999	240,528							240,528	240,528
2000	206,675							206,675	206,675
2001	157,445							157,445	157,445
2002	158,213							158,213	158,213
2003	171,748							171,748	171,748
2004	157,114							157,114	157,114
2005	154,083							154,083	154,083
2006	136,093							136,093	136,093
2007	140,680							140,680	140,680
2008	122,804							122,804	122,804
2009	122,804							122,804	122,804
2010	126,734							126,734	126,734
2011	130,789		47,693	6,480				184,962	184,962
2012	134,974	58,030	71,736	12,960	25,620			219,670	303,321
2013	139,293	86,808	71,540	12,960	38,325	13,140	0	236,933	362,066
2014	153,397	86,808	95,387	12,960	38,325	13,140	54,750	274,883	454,766
2015	160,448	144,680	107,310	19,440	38,325	13,140	82,125	300,338	565,468
2016	174,552	174,091	107,604	19,440	64,050	26,352	82,350	327,948	648,439
2017	181,604	173,616	131,157	19,440	76,650	26,280	82,125	358,480	690,871
2018	195,707	231,488	143,080	25,920	76,650	26,280	82,125	390,987	781,250

Table B-1 - Windsor International Airport Passenger Forecasts (Cont'd)
(Enplaned and Deplaned Passengers)

	Current Services	WestJet	Porter	Aug-mented Charter	Air Canada	Oil Sands	Trans-border	Most Likely	Maximum
2019	202,759	260,424	143,080	25,920	76,650	26,280	82,125	398,039	817,237
2020	216,862	261,137	143,472	25,920	102,480	26,352	82,350	412,606	858,573
2021	223,914	318,295	143,080	32,400	114,975	26,280	82,125	425,674	941,069
2022	241,314	347,231	143,080	32,400	114,975	26,280	82,125	443,074	987,405
2023	249,036	347,231	143,080	32,400	114,975	26,280	82,125	450,796	995,127
2024	257,005	348,183	143,472	38,880	115,290	26,352	82,350	465,709	1,011,532
2025	265,229	347,231	143,080	38,880	114,975	26,280	82,125	473,469	1,017,801
2026	273,716	347,231	143,080	38,880	114,975	26,280	82,125	481,956	1,026,288
2027	282,475	347,231	143,080	45,360	114,975	26,280	82,125	497,195	1,041,527
2028	291,515	348,183	143,472	45,360	115,290	26,352	82,350	506,699	1,052,521
2029	300,843	347,231	143,080	45,360	114,975	26,280	82,125	515,563	1,059,895
2030	310,470	347,231	143,080	45,360	114,975	26,280	82,125	525,190	1,069,522
1996-2000	3.43%	-	-	-	-	-	-	3.43%	3.43%
2000-2010	-4.77%	-	-	-	-	-	-	-4.77%	-4.77%
2010-2020	5.52%	-	-	-	-	-	-	12.53%	21.08%
2020-2030	3.65%	2.89%	-0.03%	5.76%	1.16%	-0.03%	-0.03%	2.44%	2.22%
2010-2030	4.58%	-	-	-	-	-	-	7.37%	11.25%

Appendix C – Aircraft Movement Statistics and Forecasts

This information is outdated at the time of finalizing the Master Plan in December 2010 and does not reflect the introduction of WestJet in 2010 and Porter in 2011.

Table C-1 - Windsor International Airport Charter and Scheduled Operations Forecasts

(Landings and Takeoffs)

	Current Operations	WestJet	Porter	Charter	Air Canada	Oil Sands	Trans-border	Most Likely	Maximum
1996	9,555							9,555	9,555
1997	8,060							8,060	8,060
1998	13,836							13,836	13,836
1999	15,370							15,370	15,370
2000	13,176							13,176	13,176
2001	8,843							8,843	8,843
2002	8,778							8,778	8,778
2003	8,159							8,159	8,159
2004	8,167							8,167	8,167
2005	8,128							8,128	8,128
2006	7,179							7,179	7,179
2007	7,421							7,421	7,421
2008	6,478							6,478	6,478
2009	6,478							6,478	6,478
2010	6,685							6,685	6,685
2011	6,899		973	48				7,921	7,921
2012	7,120	488	1,464	96	488			8,680	9,656
2013	7,348	730	1,460	96	730	104		9,008	10,468
2014	7,348	730	1,947	96	730	104	1,460	9,495	12,415
2015	7,348	1,217	2,190	144	730	104	2,190	9,786	13,923
2016	7,348	1,464	2,196	144	1,220	209	2,196	9,897	14,777
2017	7,348	1,460	2,677	144	1,460	209	2,190	10,377	15,487
2018	7,348	1,947	2,920	192	1,460	209	2,190	10,668	16,265

Table C-1 - Windsor International Airport Charter and Scheduled Operations Forecasts (Cont'd)
(Landings and Takeoffs)

	Current Operations	West Jet	Porter	Charter	Air Canada	Oil Sands	Trans-border	Most Likely	Maximum
2019	7,348	2,190	2,920	192	1,460	209	2,190	10,668	16,508
2020	7,348	2,196	2,928	192	1,952	209	2,196	10,677	17,021
2021	7,348	2,677	2,920	240	2,190	209	2,190	10,716	17,773
2022	7,348	2,920	2,920	240	2,190	209	2,190	10,716	18,016
2023	7,583	2,920	2,920	240	2,190	209	2,190	10,952	18,252
2024	7,826	2,928	2,928	288	2,196	209	2,196	11,251	18,571
2025	8,076	2,920	2,920	288	2,190	209	2,190	11,493	18,793
2026	8,334	2,920	2,920	288	2,190	209	2,190	11,751	19,051
2027	8,601	2,920	2,920	336	2,190	209	2,190	12,066	19,366
2028	8,876	2,928	2,928	336	2,196	209	2,196	12,350	19,670
2029	9,160	2,920	2,920	336	2,190	209	2,190	12,625	19,925
2030	9,454	2,920	2,920	336	2,190	209	2,190	12,918	20,218
1996-2000	8.36%							8.36%	8.36%
2000-2010	-6.56%							-6.56%	-6.56%
2010-2020	0.95%							4.79%	9.80%
2020-2030	2.55%	2.89%	-0.03%	-	1.16%	-0.03%	-0.03%	1.92%	1.74%
2010-2030	1.75%	-	-	-	-	-	-	3.35%	5.69%

Appendix D – GA Forecasts

Table D - Windsor International Airport General Aviation Forecasts (Operations)

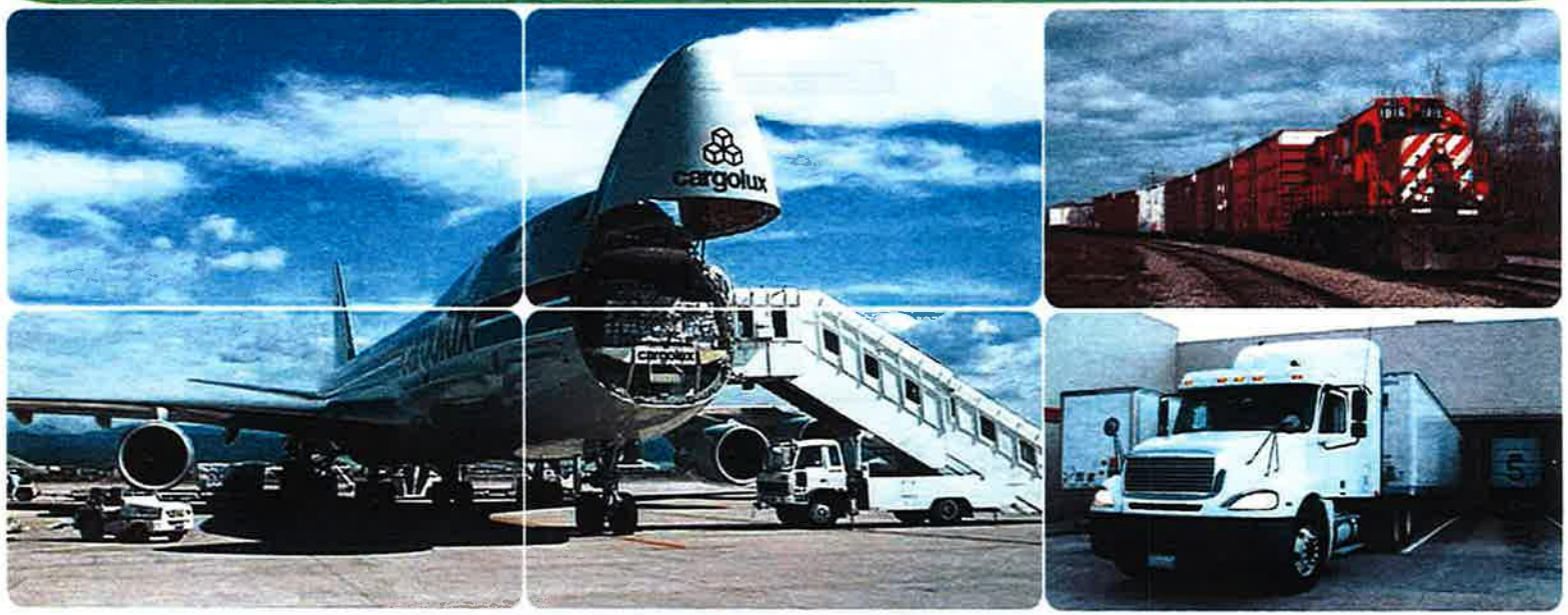
	Level IV-VI	Other Commercial	Private	Civil	Military	Local	Total
1996	11,818	889	5,669	309	155	27,480	46,320
1997	14,407	426	6,341	185	307	26,290	47,956
1998	11,996	498	7,687	230	155	10,900	31,466
1999	9,511	858	9,272	201	158	9,557	29,557
2000	7,946	654	8,061	257	399	12,333	29,650
2001	6,510	1,018	6,311	242	110	13,431	27,622
2002	5,851	1,476	6,957	284	95	8,915	23,578
2003	8,355	472	5,750	240	143	15,729	30,689
2004	5,755	1,192	4,941	312	37	12,356	24,593
2005	5,686	1,849	4,772	315	128	12,592	25,342
2006	6,920	533	4,042	298	75	9,652	21,520
2007	10,427	815	3,679	184	78	17,994	33,177
2008	11,043	923	3,716	212	56	19,145	35,095
2009	10,427	815	3,679	184	78	17,994	33,177
2010	10,531	859	3,755	189	83	18,186	33,604
2011	10,637	905	3,833	195	87	18,380	34,038
2012	10,743	954	3,913	200	93	18,576	34,480
2013	10,850	1,006	3,994	206	98	18,775	34,929
2014	10,959	1,060	4,077	212	104	18,975	35,387
2015	11,068	1,117	4,162	218	110	19,178	35,854
2016	11,179	1,177	4,249	224	117	19,382	36,329
2017	11,291	1,241	4,337	231	123	19,589	36,812
2018	11,404	1,308	4,427	237	131	19,799	37,306
2019	11,518	1,379	4,519	244	138	20,010	37,808
2020	11,633	1,453	4,613	251	147	20,223	38,320
2021	11,749	1,531	4,709	259	155	20,439	38,843
2022	11,867	1,614	4,807	266	164	20,658	39,375
2023	11,986	1,701	4,906	274	174	20,878	39,919
2024	12,105	1,793	5,008	281	185	21,101	40,474
2025	12,226	1,890	5,112	290	195	21,326	41,040
2026	12,349	1,992	5,219	298	207	21,554	41,618
2027	12,472	2,099	5,327	306	219	21,784	42,208
2028	12,597	2,212	5,438	315	232	22,017	42,811
2029	12,723	2,332	5,551	324	246	22,252	43,427
2030	12,850	2,458	5,666	334	260	22,489	44,057
1996-2000	-9.45%	-7.39%	9.20%	-4.50%	26.67%	-18.15%	-10.55%
2000-2010	2.86%	2.76%	-7.35%	-3.01%	-14.57%	3.96%	1.26%
2010-2020	1.00%	5.40%	2.08%	2.87%	5.91%	1.07%	1.32%
2020-2030	1.00%	5.40%	2.08%	2.87%	5.91%	1.07%	1.40%
2010-2030	1.00%	5.40%	2.08%	2.87%	5.91%	1.07%	1.36%

Appendix E – Multi-modal Port - Land Use Options Presentation

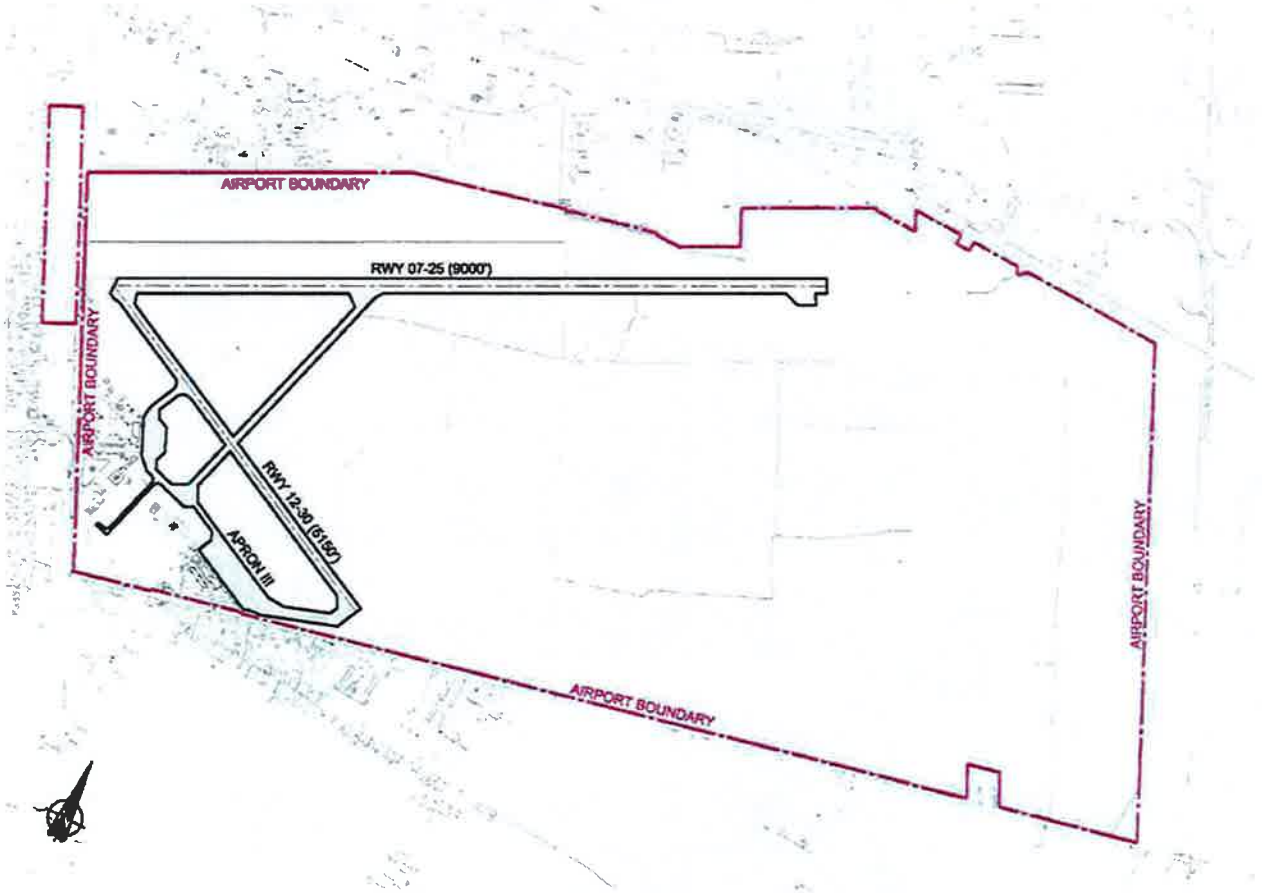
LPS AVIA CONSULTING

Multi-modal Port - Land Use Options

Windsor Airport Master Plan 2010



Airport Layout



Lufthansa Phase 1 Market Potential Analysis

Provides:

- Comprehensive analysis of Canada – U.S. trade and modality
- Analyses national and regional economies
- Quantifies existing air cargo activity within 350 km at 8 airports
- Projects **59,000 tonnes to 90,000 tonnes** of cargo by 2034
- Assumes capture/diversion of traffic from successful airports
- Other unspecified opportunities

Lufthansa Phase 2 Feasibility Study

Windsor needs to know:

- Specific strategies for capture of traffic
  - eg: superior location, unique facilities, logistics advantages, etc.
- Assumptions of how much traffic will be captured from other airports
  - either as an overall percentage, or by individual airport competitor
- Types, nature, volumes, modes, directionality or seasonality of any potential cargo flows
- Strategic risks in capturing share of existing market
- To accommodate all likely outcomes LPS AVIA has undertaken an assessment of Land Needs and Options

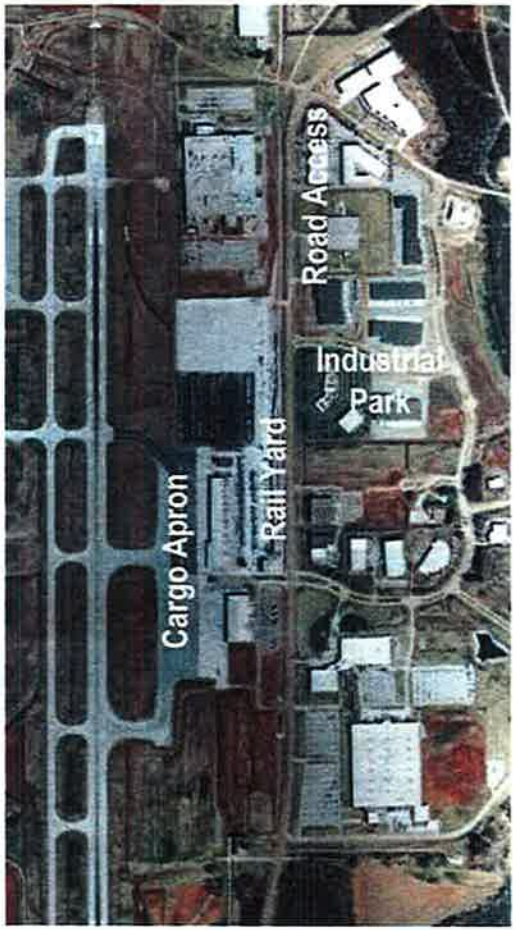
Typical Multi-modal Port Statistics

Port	Modes	Area (ha)	Recent Throughput (tonnes)
Frankfort (FRA)	Air, Ground	180	430,000
Denver (DEN)	Air, Ground	22	221,000
San Antonio (SAT)	Air, Ground	12	111,500
Kansas City (MCI)	Air, Ground	50	90,700
Baltimore-Washington	Air, Ground	20	84,000
Huntsville	Air, Ground, Rail	250*	73,000
Jacksonville (JAX)	Air, Ground	26	66,600
Richmond (RIC)	Air, Ground	16	46,500
Charlotte (CLT)	Air, Ground	72	45,000

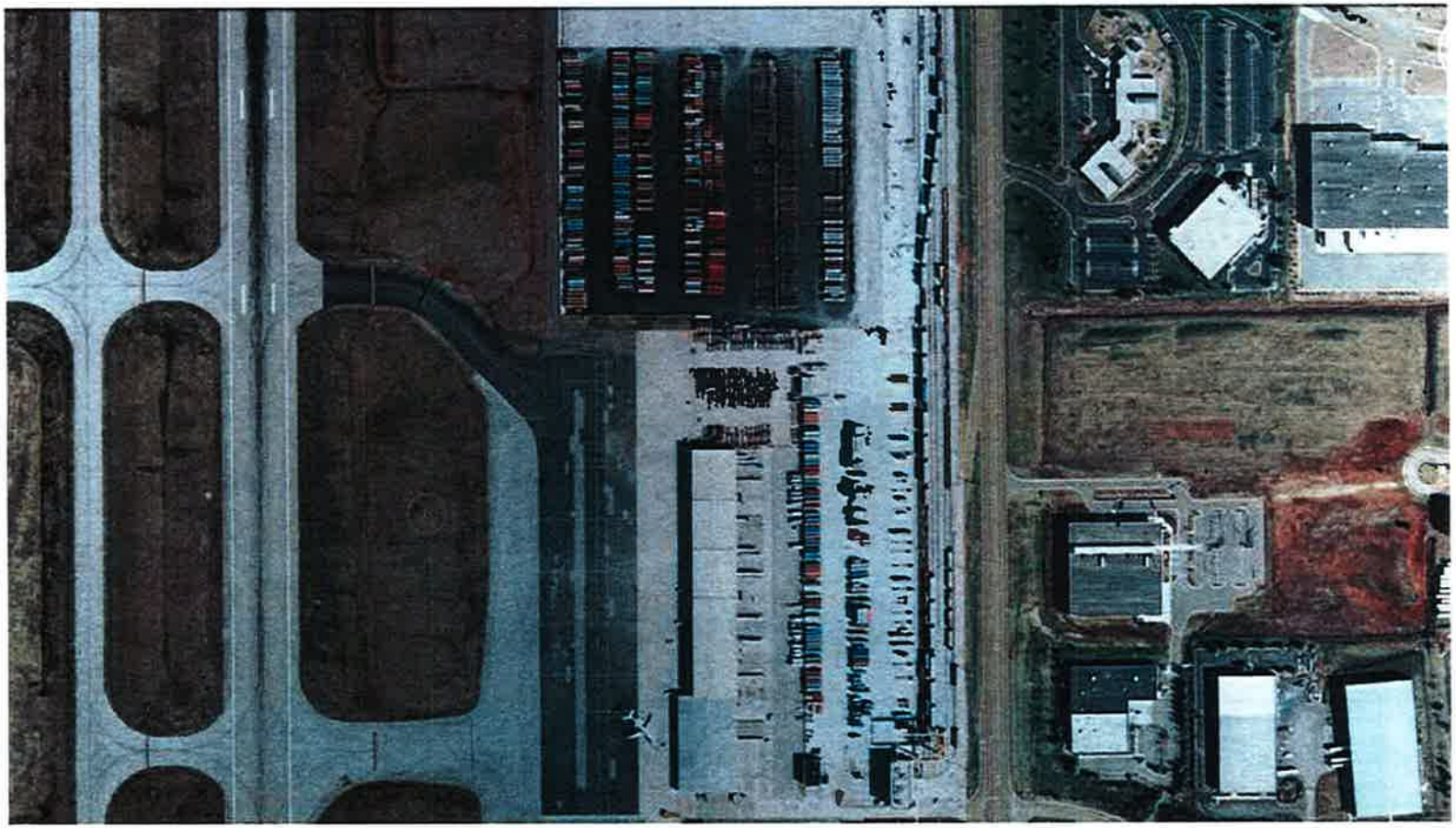
* includes adjacent industrial park and available lands

Case History – Huntsville Alabama

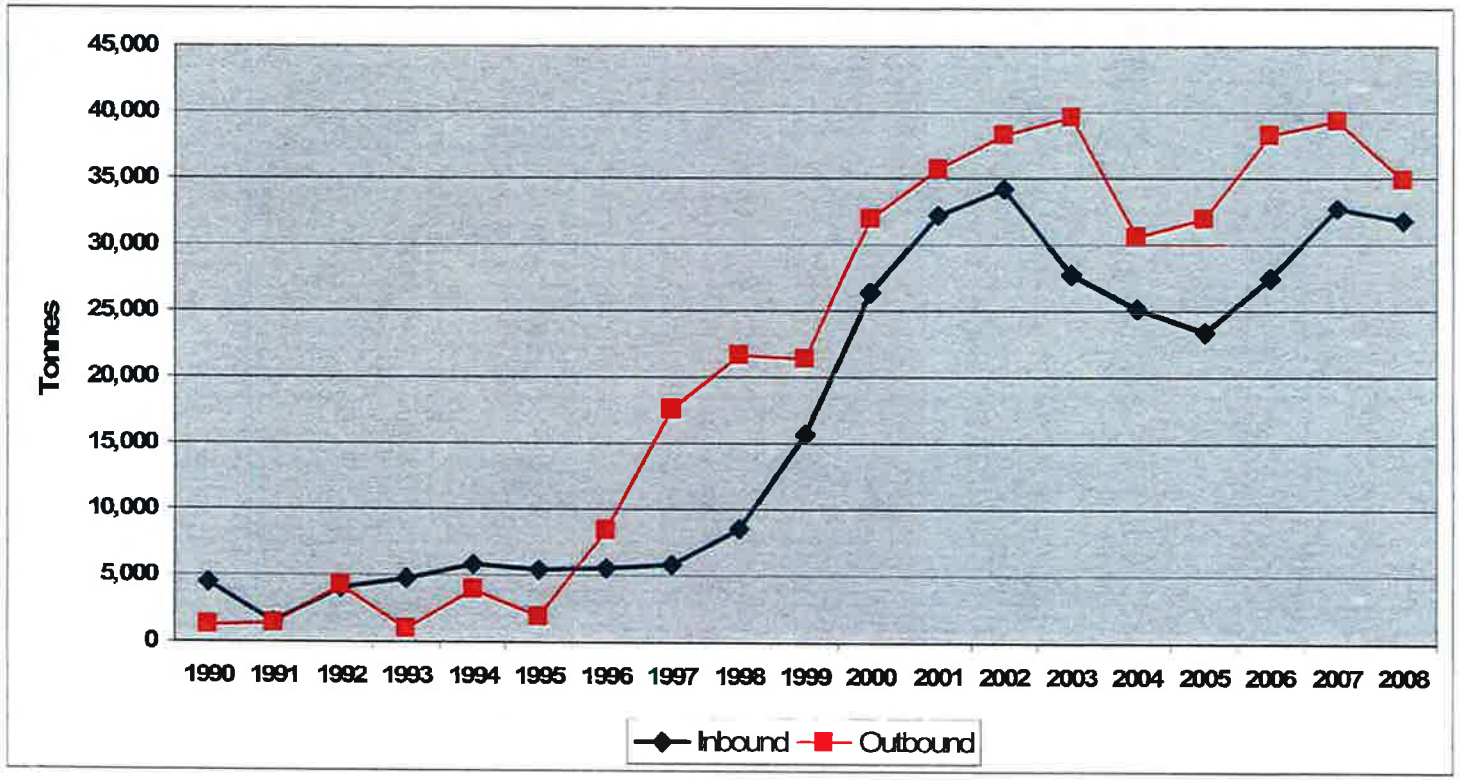
- Best successful analogy to Windsor Airport
- Huntsville population 176,000
- 1.2 million air passengers
- 12,600 ft. runway
- Intermodal centre for U.S.- Europe cargo
- Airport has:
  - Air cargo terminal
  - International all-cargo flights
  - Rail spur for container trains
  - Foreign trade zone
  - Industrial park
  - Inland port
- Multi-modal port approximate area **250 ha.**



Huntsville Alabama



Huntsville Air Cargo Growth



Why Huntsville Succeeded

1. 12,600' runway can accommodate international freighter flights
2. Centroid of demand for high value air transportation
3. Forwarder established consolidation center (Panalpina)
4. Forwarder chartered freighter aircraft
   - CargoLux service for Huntsville-Luxembourg flights

Most forwarders rely on belly capacity in passenger flights (see Phase 1 Report)

Why Huntsville Succeeded

5. Truck access from Houston
   - high value petroleum-related cargo
6. Truck access from manufacturing areas of Carolinas
   - sophisticated high value items (transportation premium)
7. Concentration of foreign car plants in Alabama and Tennesee
8. Oak Ridge Laboratories
   - nuclear weapons research complex
9. On major Interstate Highways

Support of air freight forwarder is essential for air cargo airport development

Limits of Huntsville Model

- Panalpina tried to establish similar operation at Hartford Connecticut but failed
  - Too close to large airports, inadequate traffic
- Huntsville has so far not obtained trans-Pacific freighter flights
- Multi-modal operations are limited
  - Trucks feed air or rail modes
  - Rail does not usually feed air mode
- Reliance on one forwarder and on all-cargo flights has risks.

Windsor Airport Land Reserve Options

- LPS AVIA has developed 3 options for multimodal land development within current Windsor Airport Lands

Option 1: Maximum Multi-modal Port Capability

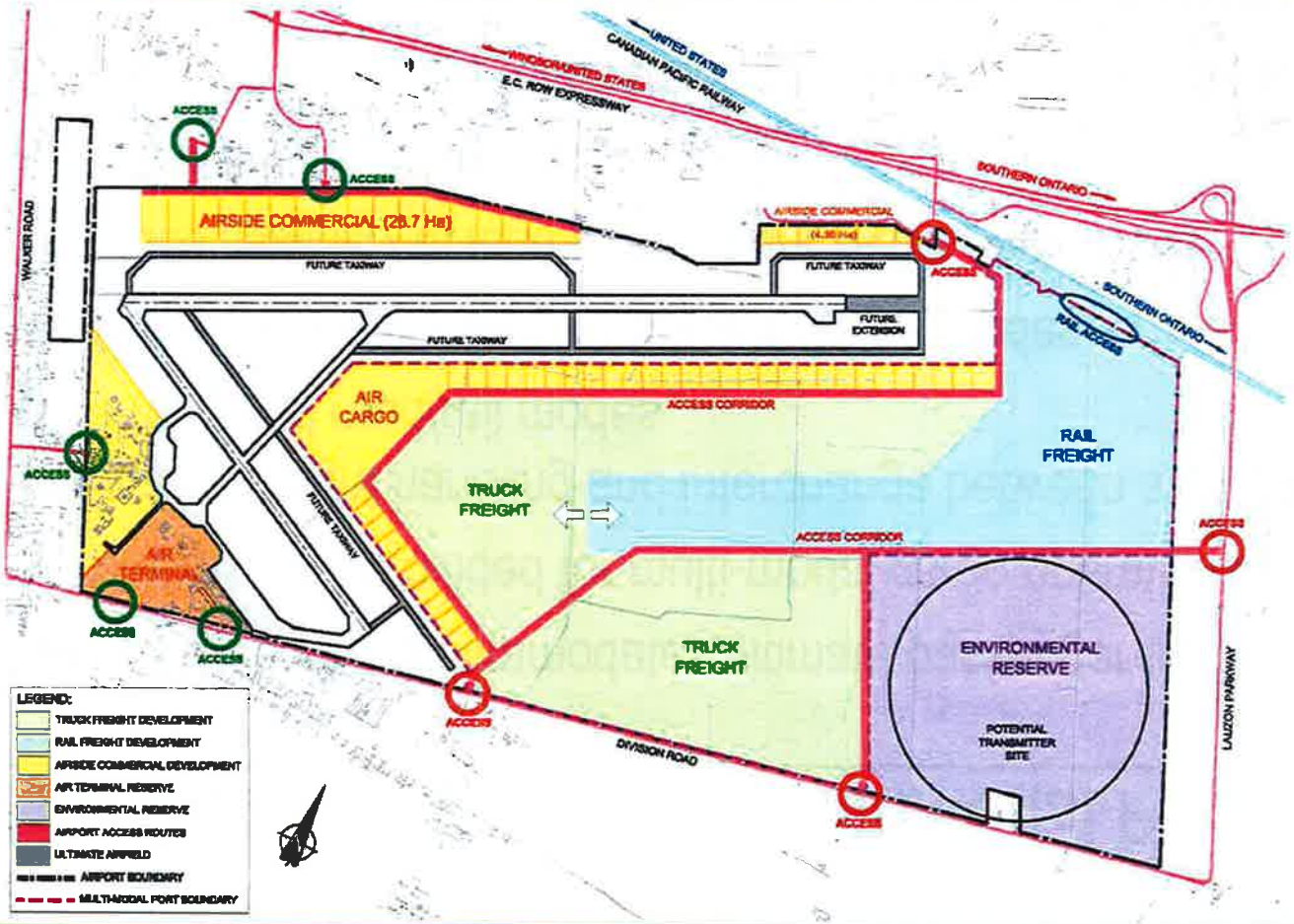
Option 2: Minimum Multi-modal Port Capability

Option 3: Multi-Opportunity Configuration

Windsor Option 1 - Maximum Multimodal Port

- Current ATB site accommodates ultimate passenger traffic
- Maximizes land provided for multi-modal cargo operations
- Integrates freight handling and interchange between air/road, road/road and road/rail modes
- Addresses key adjacency requirements for modes
- Provides flexibility of land assignment within each mode
- 4 multi-modal road access points
- 1 CP rail access point (bi-directional with parallel mainline siding)
- Extensive air cargo linear facility and hub operation capability
- Area of Multi-modal port up to **360 ha**.

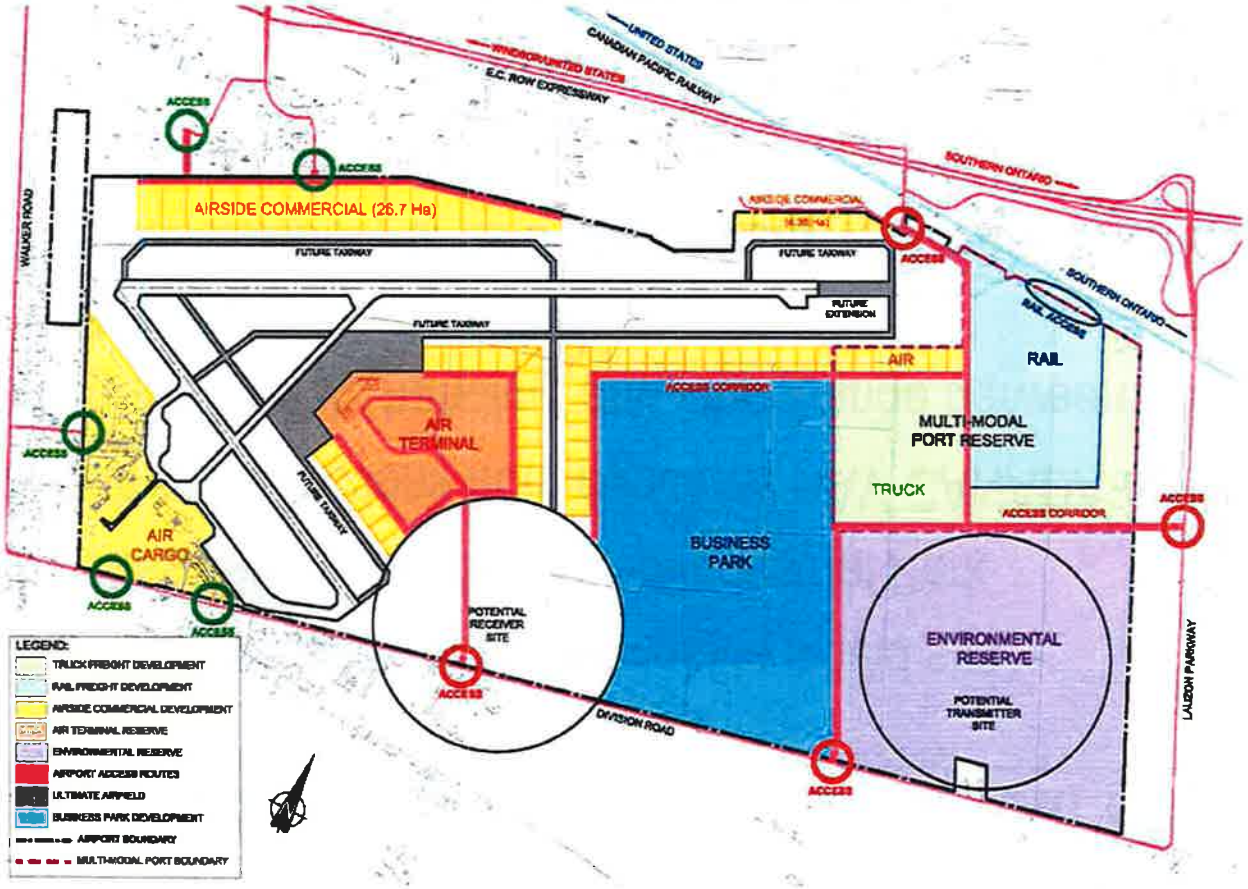
Windsor Option 1 – Maximum Multimodal Port



Windsor Option 2 - Minimum Multimodal Port

- Includes relocation of air terminal to infield site
- Includes independent or linked Industrial Park
- Assumes restrictions from relocated NAV CANADA equipment
- Integrates freight handling and interchange between:
  - Air/road, road/road and road/rail modes
- Provides flexibility of land assignment within each mode
- 3 multi-modal road access points
- 1 CP rail access point (bi-directional with parallel mainline siding)
- Moderate air cargo linear facility capability
- Area of Multi-modal port component approximately **100 ha.**

Windsor Option 2 – Minimum Multimodal Port



Rail Option - Inland Port

- Inland consolidation centre
- Expedited rail link to ocean port
- Trucks connect to inland shippers and consignees.
- Inland port relieves congestion at water ports and helps them attract business
- Attracts forwarders, manufacturers, warehousing
- Example: Virginia Inland Port
- Area approximately **26 ha.**

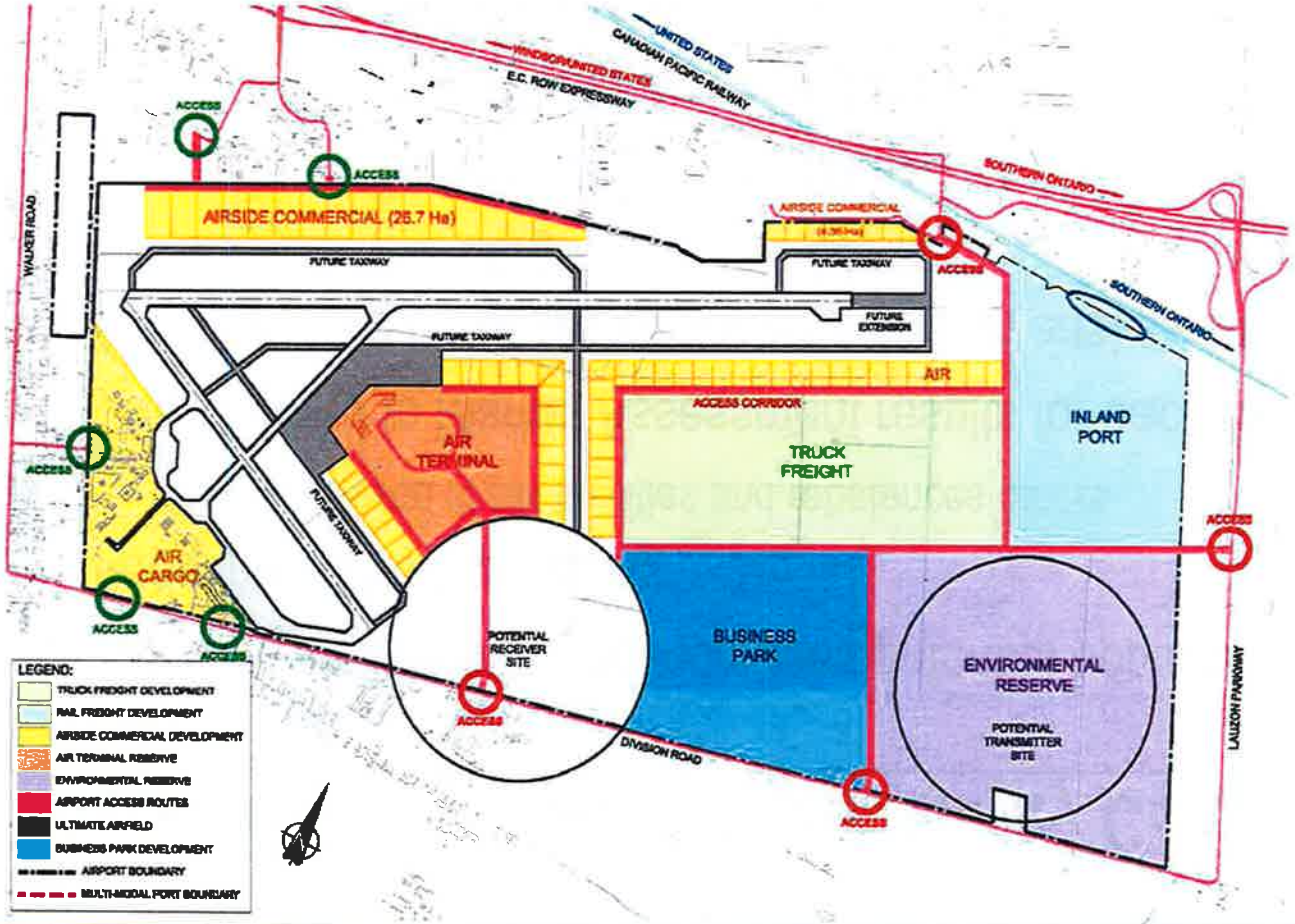
Virginia Inland Port

Windsor Option 3 – Multi-Opportunity Configuration

- Expands on Option 2 and increases potential opportunities
- Adds Inland Port capability
  - Increases area of rail facilities and rebalances others
- Can respond to Market Assessment results for each mode
- For illustrative purposes assigned areas on east side include:

Air Cargo	=	22 ha.
Rail Freight	=	60 ha.
Truck Freight	=	83 ha.
Industrial Park	=	70 ha.
Total	=	**235 ha.**

Windsor Option 3 – Multi-Opportunity Configuration



Findings for Multi-modal Land Reserve

Air Cargo

- Base investment strategy on finding a freight forwarder willing to develop an operation at Windsor
- Support development of passenger services to boost Windsor cargo capacity
- Consider Huntsville Airport as a multi-modal model

Rail

- Evaluate Inland Port option
- Establish partnerships with ports, railroads for services to Windsor
- Locate port to promote development of related industries
- Consider Virginia Inland Port as a model

Findings for Airport Master Plan

Master Plan must :

- accommodate air cargo arising from intermodal projects, through providing sufficient space for cargo terminals;
- provide non-conflicting land uses with intermodal terminals or inland port developments;
- provide flexibility to accommodate unforeseen activities in adjacent lands;
- be based on a broad economic development plan for airport and adjacent lands.

Conclusions

1. Ample land is available for development:
   Multi-modal Port, Inland Port, Industrial Park and Cargo Village
2. A large port can be developed while reserving sufficient land for ultimate airport development.
3. A series of specialist studies are required to establish the scope, scale, timing and modes of port development.
4. Individual site development plans will define the type, nature, volumes, modes, directionality and seasonality of cargo flows.
5. Option 3 provides the most flexible balance of land assignments for air, truck and rail modes capable of accommodating all likely needs multi-modal port needs and good access for rail, road, air cargo movement.

Recommendations

1. It is recommended that a Staged Master Plan approach be adopted.
2. Master Plan Updates can be prepared as specialist studies are undertaken and completed.
3. It is recommended that the Master Plan adopt Option 3 Multi-opportunity Configuration for accommodating a Multi-modal Port facility as the base concept for the Master Plan.
4. Results of specialized studies can be integrated as they become available.

Questions

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www.lpsaviation.ca

Appendix F – Public and Agency Consultation

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WINDSOR INTERNATIONAL AIRPORT

WELCOME

MASTER PLAN 2010

WINDSOR INTERNATIONAL AIRPORT

Public Information Centre: Monday May 30, 2011

MASTER PLAN 2010

WINDSOR INTERNATIONAL AIRPORT

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Outline of Panels

- Purpose of the Master Plan and Goal
- About the Windsor Airport
- Land Use Plan
- General - Current Conditions Plan
- Conceptual Development Plan
- Development Constraints Drawing
- Recommended Development Plan
- Existing Servicing - External
- Aircraft Noise

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WINDSOR INTERNATIONAL AIRPORT

MASTER PLAN 2010

WINDSOR INTERNATIONAL AIRPORT

Public Information Centre: Monday May 30, 2011

Purpose of the Master Plan

- The Windsor International Airport Master Plan is the overall planning document that will guide the development of the Airport and assist the City and the private sector in making land use decisions involving surrounding lands.
- It provides an in-depth profile of the physical conditions and capacities of the Airport's facilities and infrastructure and determines requirements to meet future needs and development potential, while recognizing the financial implications of improvements.
- The Master Plan builds on the vision of YQG and the City to facilitate long range planning and development on the surrounding lands that support and reinforce the City's investment in Windsor International Airport.

GOAL:

To stimulate cost effective development on the Windsor International Airport lands through the short (2010-2015), medium (2016-2020) and long-term (2021-2031) planning horizons.

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WINDSOR INTERNATIONAL AIRPORT

YQG YOUR QUICK GATEWAY

project title: GENERAL SITE PLAN	drawing title: AIRPORT BOUNDARY	scale:	styles file name:	approved by:	date:	drawing no.: YQG 001
drawn by: PJR	designed by:	checked by: FN	date: AUGUST 2010	rev.	sheet: 1 of 1	

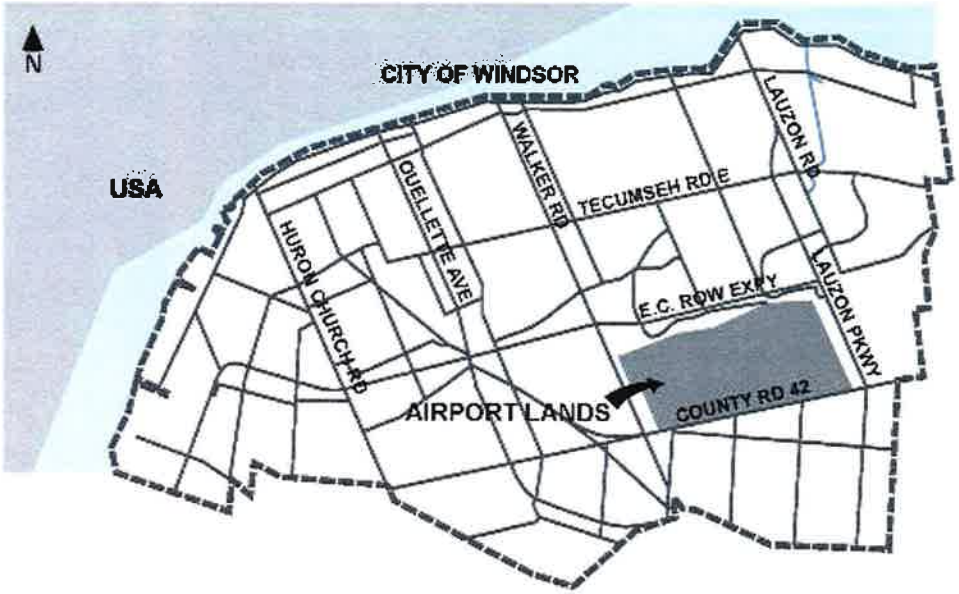
MASTER PLAN 2010

WINDSOR INTERNATIONAL AIRPORT

Public Information Centre: Monday May 30, 2011

About the Windsor International Airport

Windsor International Airport is owned by the Corporation of the City of Windsor and is operated by Your Quick Gateway (Windsor) Inc. (YQG), a wholly owned corporation of the City of Windsor under a long-term management agreement.



- The Windsor International Airport property is approximately 813 hectares in size and is located within the Sandwich South Planning District in the City of Windsor, approximately 8 km south of the Windsor Downtown area.
- The Airport is part of the Windsor-Essex Region, composed of the City of Windsor and the County of Essex.

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WINDSOR INTERNATIONAL AIRPORT

MASTER PLAN 2010

WINDSOR INTERNATIONAL AIRPORT

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Land Use Plan

The Airport lands comprise approximately 813 hectares and are designated "Airport, Industrial, Future Employment Area, Open Space and Natural Heritage" in the City's Official Plan.

Purpose of this Land Use Plan:

The recommended Airport Land Use Plan has been prepared to address short, medium and long-term development potential. The intent of the Land Use Plan is to identify and provide maximum flexibility in the use of Airport lands, thereby supporting broader City and Airport business objectives.

Current Airport Land Use Plan

An Airside Land Reserve Plan was prepared in June, 2003 to provide a rational and comprehensive framework for the use and development of Airport lands. The plan identified surplus land within the Airport property.

The Land Reserve Plan has been utilized by Airport management since 2003. Several recommendations were made for future land use and Airport expansion in the Airside Land Reserve Plan. These recommendations have been considered in developing the Master Plan, as well as a number of new issues and requirements.

On-Airport Land Use Regulations

Land use on the Airport property must respect the requirements of Transport Canada's TP312E. These aerodrome standards and recommended practices place various restrictions necessary within the Airport land area and include specific criteria for building structures on the property.

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WINDSOR INTERNATIONAL AIRPORT

WINDSOR AIRPORT MASTER PLAN

FIGURE 7-1 - RECOMMENDED LAND USE PLAN

- COMMUNICATIONS RESERVE
- AIRPORT EMPLOYMENT
- AIRFIELD RESERVE
- GENERAL AVIATION
- AIR TERMINAL RESERVE
- EMPLOYMENT LANDS
- AIRPORT TERMINAL BUILDING
- OPEN SPACE/NATURAL HERITAGE
- EXISTING AIRCRAFT PAVEMENT
- FUTURE AIRCRAFT PAVEMENT
- PROPOSED LAND ACQUISITIONS
- TOWER LINE OF SIGHT
- EXISTING PAVEMENT (ROAD)
- DRAIN

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WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

LPS AVIA CONSULTING

Base data provided by City of Windsor
Map created by Paddy Kennedy
Map checked by FRF

0 100m 500m 1km
SCALE

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

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W E
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MASTER PLAN 2010

WINDSOR INTERNATIONAL AIRPORT

Public Information Centre: Monday May 30, 2011

Recommended Development Plan

- The Development Plan is intended to meet the current and future airside, air terminal and groundside requirements of Windsor International Airport.
- The plan allocates sufficient land to accommodate Airport growth beyond the planning horizon.
- It is recommended that implementation of projects be demand driven as Airport marketing and growth objectives are achieved.

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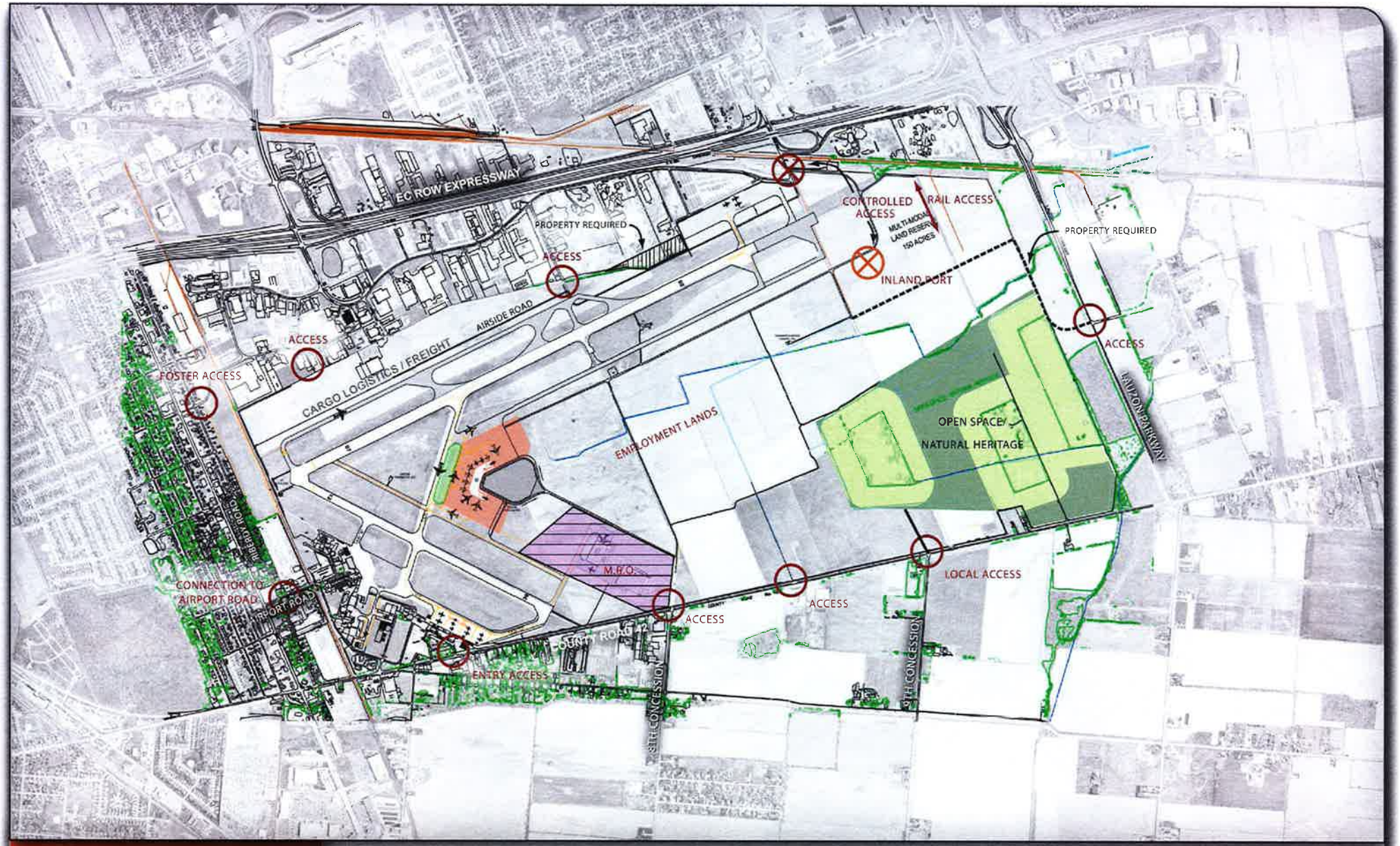

WINDSOR AIRPORT MASTER PLAN

FIGURE 8-1 - RECOMMENDED DEVELOPMENT PLAN

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WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

LPS AVIA CONSULTING

Base data provided by City of Windsor
Map created by Paddy Kennedy
Map checked by FRF

0 100m 500m 1km
SCALE

File Location: \\20dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/a
Project #: 09-2665
Status: n/a
Date: December 2010

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W E
S

MASTER PLAN 2010

WINDSOR INTERNATIONAL AIRPORT

Public Information Centre: Monday May 30, 2011

Existing Servicing - External

Water Supply:

- The WUC Windsor Water System Master Plan, Oct. 2009, identified the need to construct a trunk watermain along County Road 42 across the frontage of the Airport lands by 2013.

Sanitary Sewerage:

- The City of Windsor has recently completed the installation of a trunk sanitary sewer to service the Sandwich South Planning District, including a portion of the Airport lands.

Stormwater Drainage:

- The Airport lands are primarily located within the Little River watershed. Storm drainage on the Airport lands is currently being collected by five municipal drains, two of which originate on the Airport lands

Recommendations:

- An assessment of the Airport's existing on-site water distribution system be carried out to identify opportunities to modify/expand the existing system.
- Environmental studies be updated and compiled in a more comprehensive biological inventory for flora, fauna and aquatic species.
- Comprehensive functional stormwater management study be completed to identify an appropriate strategy for implementing the necessary runoff control and mitigating measures for the development of these lands.

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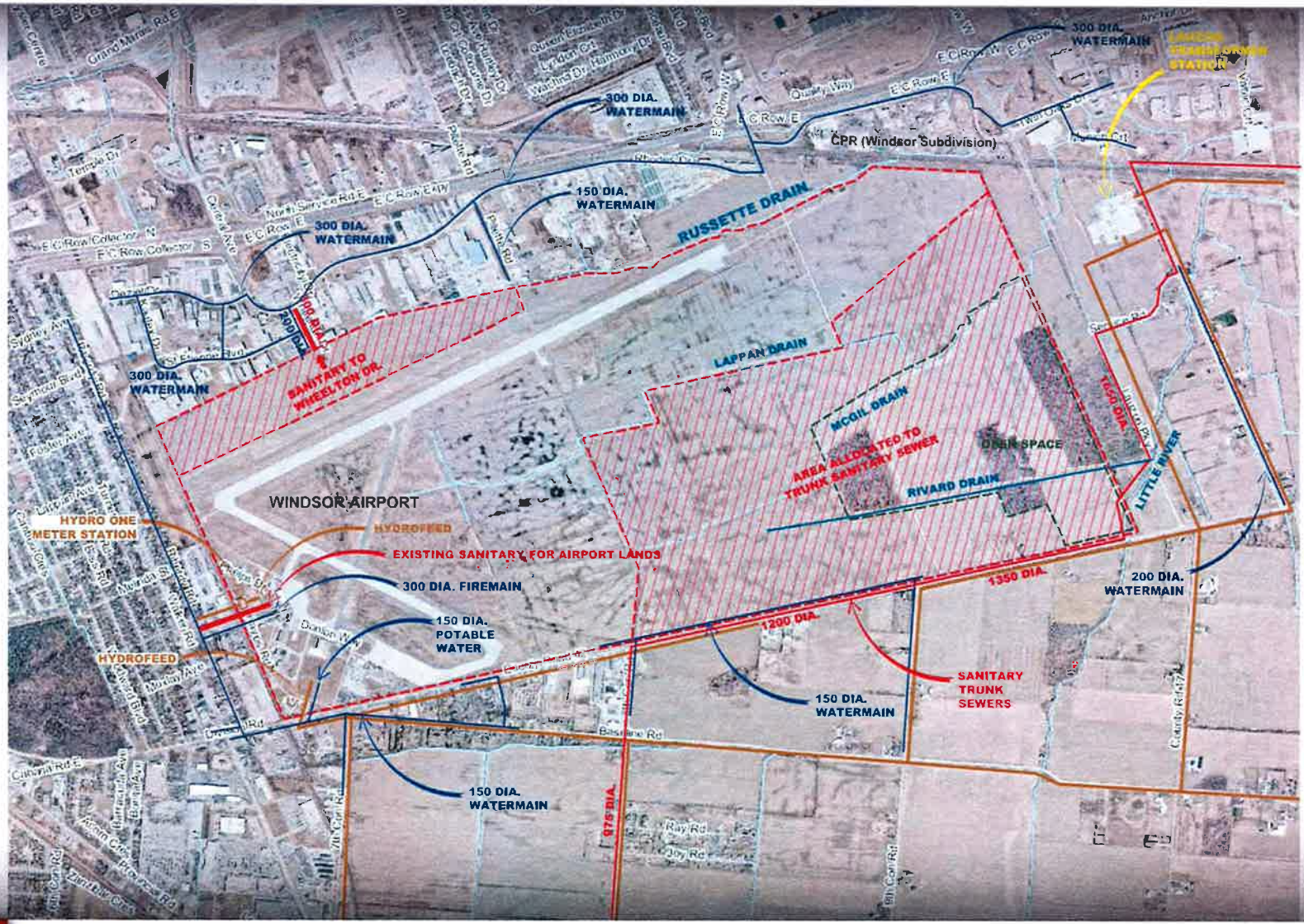
WINDSOR INTERNATIONAL AIRPORT



WINDSOR AIRPORT MASTER PLAN

FIGURE 5-4 - EXISTING SERVICING EXTERNAL

WATERMAIN
SANITARY SEWER
MUNICIPAL DRAINS
POWER DISTRIBUTION

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WINDSOR INTERNATIONAL AIRPORT

DILLON CONSULTING

Base data provided by City of Windsor Official Plan
Map created by DAM
Map checked by PMM/ERF

File Location: \\Dillon.dillon.ca\toronto data\PROJECTS\DRAFT\09\092665 Windsor Airport Master Plan

Map Projection: n/a
Project #: 09 2665
Status: n/a
Date: December 2010

Notes:
1. Conceptual Layout

MASTER PLAN 2010

WINDSOR INTERNATIONAL AIRPORT

Public Information Centre: Monday May 30, 2011

Aircraft Noise

- One of the environmental impacts of Airport activity can be noise generated by aircraft landing or taking off.
- To estimate potential noise impacts on areas in the vicinity of Airports, Noise Exposure Forecast contours (NEF) are prepared based on the types of aircraft operating at the Airport and flight frequencies.
- NEF contours are presented to measure the likely level of community response to aircraft noise.
- The adjacent table describes the NEF contour intervals and corresponding community response predictions, as per Transport Canada's document TP1247 – Land Use in the Vicinity of Airports.

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

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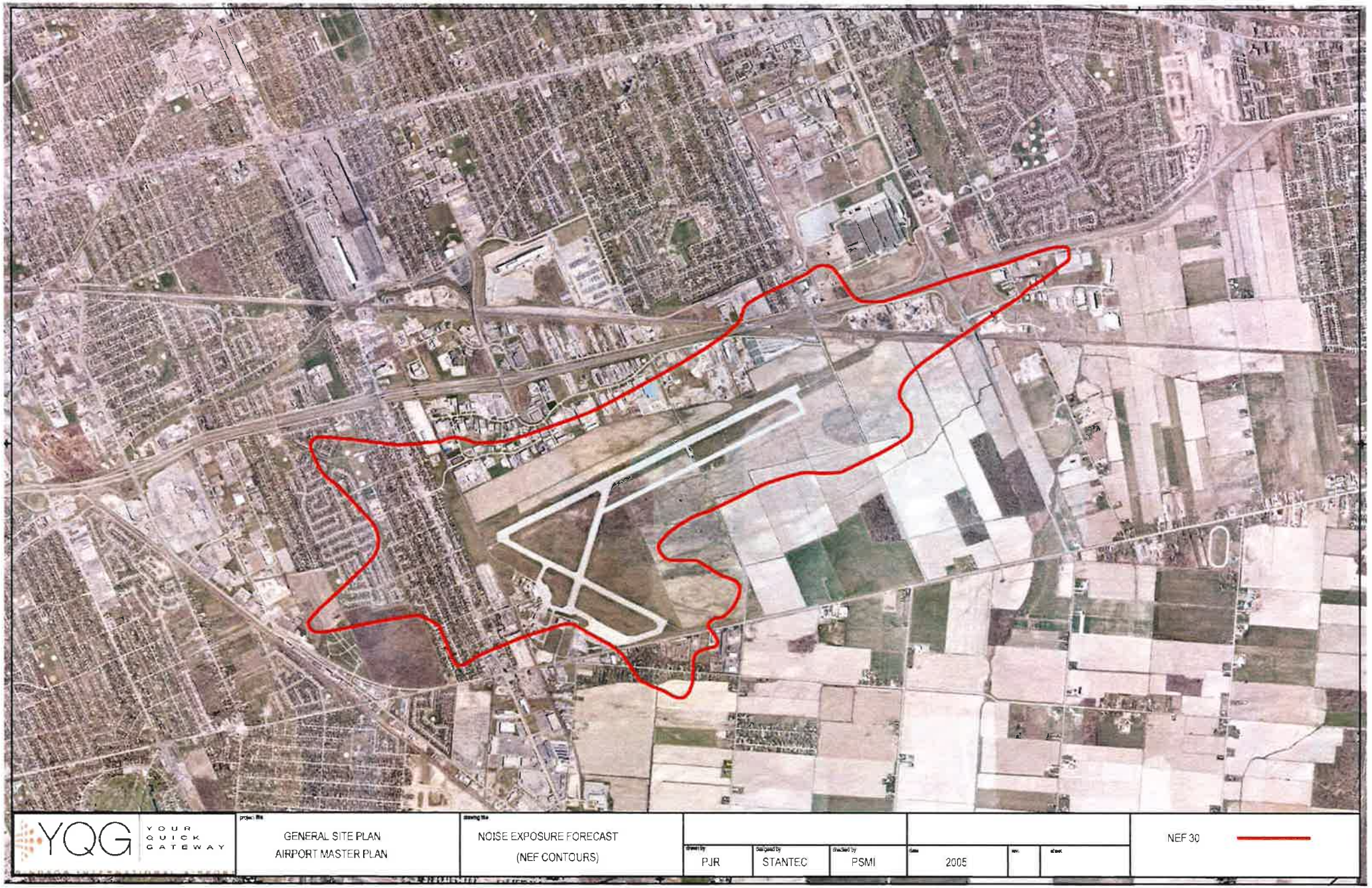
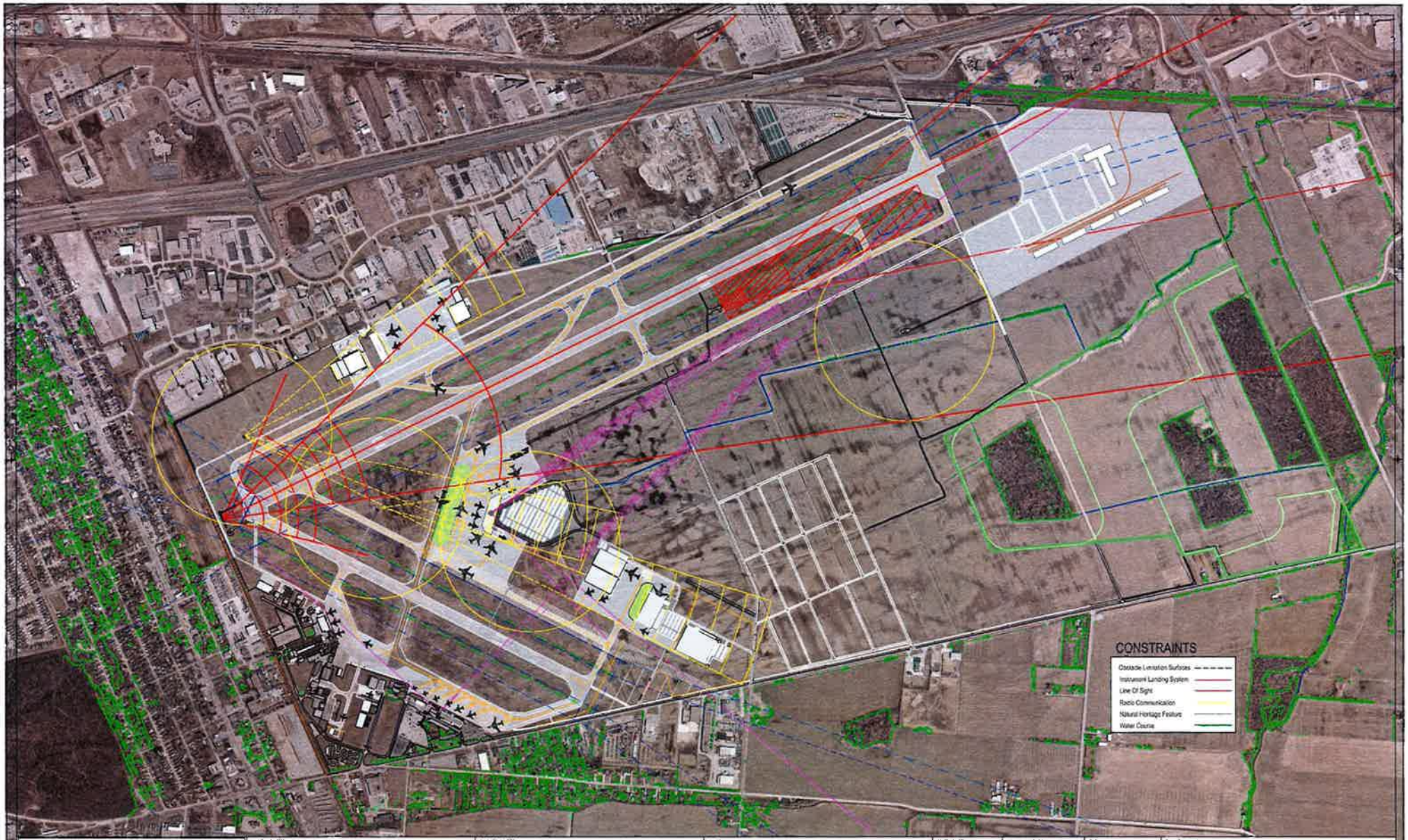
WINDSOR INTERNATIONAL AIRPORT



YQG YOUR QUICK GATEWAY

project title: GENERAL SITE PLAN AIRPORT MASTER PLAN	drawing title: NOISE EXPOSURE FORECAST (NEF CONTOURS)						NEF 30
		drawn by: PJR	designed by: STANTEC	checked by: PSMI	date: 2005	rev:	sheet:

YQG YOUR QUICK GATEWAY	project title: CONCEPTUAL DEVELOPMENT PLAN BASE DRAWING	drawing title: AIRPORT DEVELOPMENT CONSTRAINTS GENERAL REFERENCE DRAWING (AIRPORT MASTER PLAN)	scale	digital file name	approved by	date	drawing no.: LAND USE PLAN 001
			drawn by: P. ROBERTS	designed by: PJR	checked by	date: DECEMBER 2010	rev.	sheet: 1 of 2



YQG YOUR QUICK GATEWAY

project title
CONCEPTUAL DEVELOPMENT PLAN
BASE DRAWING

drawing title
AIRPORT DEVELOPMENT CONSTRIANTS
(Reference Fig. 8.1)
(AIRPORT MASTER PLAN)

scale			digital file name	approved by	date	drawing no.
drawn by: P. ROBERTS	designed by: PJR	checked by:	date: DECEMBER 2010	rev.	sheet: 2 of 2	LAND USE PLAN 001

THE CORPORATION OF THE CITY OF WINDSOR
PUBLIC WORKS - ENGINEERING DEPARTMENT

P. O. BOX 1607, 350 City Hall Square West
Windsor, Ontario N9A 6S1
PHONE: 519-255-6257 (8:00 a.m. to 4:30 p.m.)
or
PHONE 519-255-6326 (24 hour emergency service)
or
FAX: 519-255-9847

To: Windsor Star **Date:** **May 10, 2011**

From: Mario Sonego, P. Eng.
City Engineer **Pages:** 2

Subject: **Notice of Public Information Centre**
Windsor International Airport
Master Plan 2010

Windsor International Airport is owned by the Corporation of the City of Windsor and is operated by Your Quick Gateway (Windsor) Inc. (YQG), a wholly owned corporation of the City of Windsor under a long-term management agreement. A Master Plan for the Windsor International Airport has been prepared by Dillon Consulting and LPS Avia Consulting. The Master Plan is the overall planning document that will guide the City of Windsor, YQG and the private sector in the development of Windsor International Airport over the next twenty years. The Master Plan not only provides a detailed review of the existing conditions of the terminal, runways, infrastructure, and airport lands, both existing and planned, but also provides an outline for future needs and development potential, while recognizing the implications of those improvements from a financial and environmental perspective.

Public Information Centre

An Open House has been arranged to view the Master Plan:

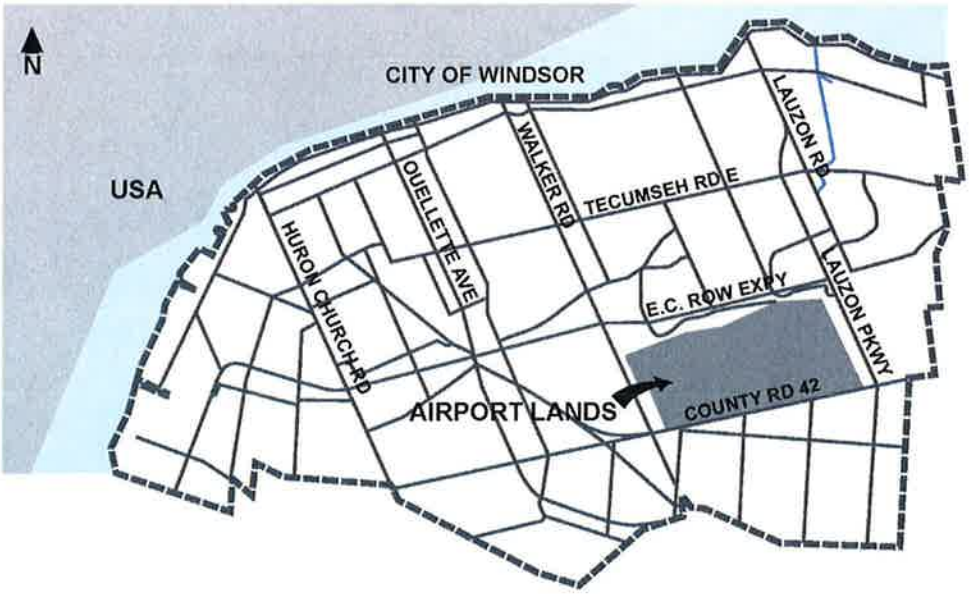
Date:	Monday May 30, 2011
Time:	4:00 PM to 8:00 PM
Location:	Windsor International Airport (West Conference Room)
Address:	3200 County Road 42, Windsor ON

The purpose of the Public Information Centre is to obtain public feedback on the Airport Master Plan. All interested parties in the Master Plan are invited to the Open House. If you cannot attend and would like to provide comments, please forward them by June 13, 2011 to:

Tiffany Pocock, P. Eng, Project Manager
City of Windsor Engineering–Development and Geomatics
350 City Hall Square West, 4th floor,
Windsor, ON. N9A 6S1
tpocock@city.windsor.on.ca

Ron Shishido, RPP, Project Manager
Dillon Consulting Limited
235 Yorkland Boulevard, Suite 800
Toronto, ON M2J 4Y8
rshishido@dillon.ca

Keynote Drawing:



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Windsor, Ontario N9A 6S1
PHONE: 519-255-6257 (8:00 a.m. to 4:30 p.m.)
or
PHONE 519-255-6326 (24 hour emergency service)
or
FAX: 519-255-9847

To:	Stakeholders and Interested Parties	**Date:**	**May 10, 2011**
From:	Mario Sonego, P. Eng. City Engineer	**Pages:**	2
Subject:	**Notice of Public Information Centre Windsor International Airport Master Plan 2010**		

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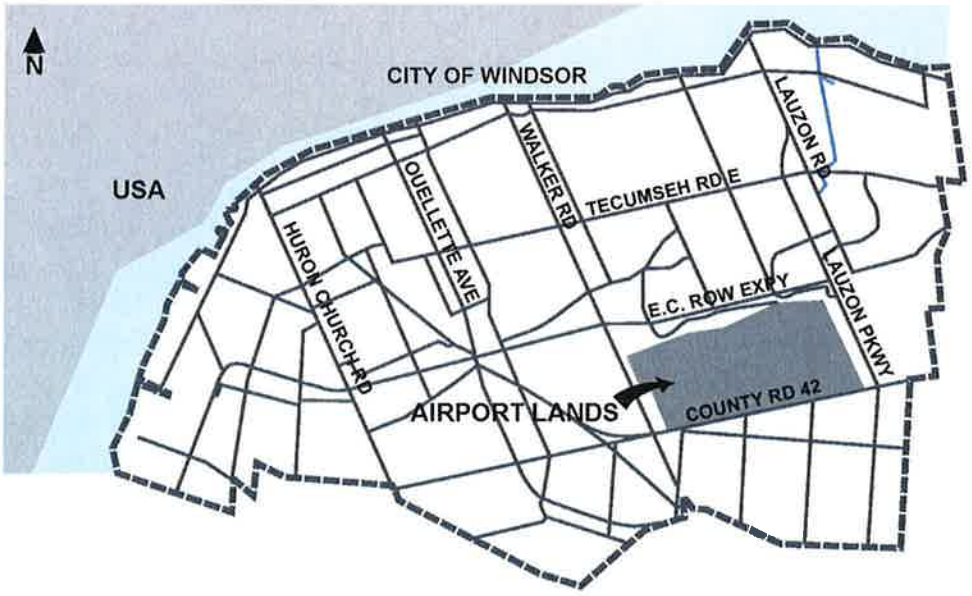
tpocock@city.windsor.on.ca

Ron Shishido, RPP, Project Manager
Dillon Consulting Limited
235 Yorkland Boulevard, Suite 800
Toronto, ON M2J 4Y8
rshishido@dillon.ca

Keynote Drawing:



Windsor Airport Master Plan

Notification of Public Meeting sent to the following:

- Mayor Eddie Francis
- Councillor Drew Dilkens
- Councillor Ron Jones
- Councillor Fulvio Valentinis
- Councillor Alan Halberstadt
- Councillor Ed Sleiman
- Councillor Jo-Anne Gignac
- Councillor Percy Hatfield
- Councillor Bill Marra
- Councillor Hilary Payne
- Councillor Al Maghnieh
- City Engineer, Mario Sonego
- Chief Administrative Officer, Helga Reidel
- City Financial Office/City Treasurer, Onorio Colucci
- Community Development and Health Commissioner, Ronna Warsh
- City Clerk/License Commissioner, Valerie Critchley
- City Solicitor, George Wilkki
- 311
- Essex Region Conservation Authority
- County of Essex
- Town of Tecumseh
- Town of LaSalle
- Bell
- Union Gas
- Cogeco
- EnWin
- Hydro One
- Ministry of Municipal Affairs
- Development Commission
- Chamber of Commerce
- City of Windsor Planning Department
- City of Windsor Transportation Planning
- City of Windsor Environmental
- YQG Board Mayor Francis
- YQG Board Kevin Laforet
- YQG Board Deborah Dent
- YQG Board Ron Holden
- YQG Board Robert Payne
- YQG Board Mike Raymond
- YQG Board Renato Discenza

- YQG Board Jack Fraser
- YQG Board Ed Sleiman
- YQG Board Drew Dilkens
- Dr. Fred Netherton
- Goggin Hangar
- Atlas Tube
- Aeroguard
- AES-Weather Office
- Air-Way Aviation
- Air Side Logistics
- Avis Car Inc.
- Budgetcar Inc.
- Canada Border Services
- Commissionaires
- Canadian Historical Aircraft Association
- Great Lakes Flight Centre
- Centerline
- Centaero Aviation
- Highline Mushrooms
- Gas Cylinder
- Hrycay
- Air Canada Express
- Mara-Tech Aviation
- National Auto Rad
- Nav Canada
- DeGraw Automotive Group
- W.C.S. Aviation
- Warp Drive
- WestJet
- Windsor Airline Limo
- Windsor Flying Club
- Wizie Inc.
- TST Air
- Transport Canada

Windsor International Airport
Master Plan 2010

Public Information Centre: Monday May 30, 2011
Sign In Sheet

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

THE CITY OF WINDSOR

Name	Address	City	Postal Code	Phone	Email	Initial
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Ruth McFarlane	3645 County Rd 42	Windsor		5199699152	ruthmc@sympatico.ca	
Glen McFarlane	"	"		"	"	
Richard Bradwell	Windsor Flying Club	"		519 736 9732	Bradvs1@Hotmail.com	
Jane Mustac	County of Essex	'		519 776 6441 x597	jmustac@county of essex on. ca	
Thom Hunt	City Planner					
John Robinson	Canadian Historical Aircraft Assoc.			519-300-4539	JRobinson1@xplornet.com	
Tim Byrne	ERCA 360 Fairview Ave W	Essex		519-776-5209	TByrne@erca.org	
Rebecca Belanger	ERCA 360 Fairview Ave.	Essex.	N8M1Y6	519 776-5209	rbelanger@erca.org	
DAN SAWCHUK	WINDSOR AP 3200 COUNTY RD 42 UNIT C	WINDSOR			AIRWAYS@WINDSOR.NET	
CHARLIE WRIGHT	DEPUTY MAYOR - LEAMINGTON CO-CHAIR W.E.I.C.E.C.	Leamington		519-326-5761	cwright@leamington.ca	
CURTIS POPE	100 Duncan Mc Rd	Windsor		519-250-4956	cpope0@hotmail.com	
Ted Arkan Efpe	5630 Baseline		N0R1K0	519-735-6226	tedurken@yahoo.ca	
Terry J. Aldea Sr.	4955 Riverside Dr E	Windsor	N8Y5P3		tjaldea1934@sympatico.ca	
Charles Acord	825 Riverside Dr. W.	Windsor	N9A 5L3	CBC		
Kristopher Kelly	1040 Odette	Windsor		AMSOC		
TerryAldea	5505 Rhodes Dr	Windsor	N8N-2M1	519-566-7630	terryaldea@Sympatico.ca	

Windsor International Airport
Master Plan 2010

Public Information Centre: Monday May 30, 2011
Sign In Sheet

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

THE CITY OF WINDSOR

Name	Address	City	Postal Code	Phone	Email	Initial
Jason Lamplugh	3526 Ribery	Windsor	N8W-3H5	250-6655	CODEDELTA9@GMAIL.com	
Robert Spagnuolo / EnWin	4545 Rhodes	Windsor		251-7300 x 222	rspagnuolo@enwin.com	
Susan + Peter Kennedy	3502 Ribery	Windsor	N8W-3V6	966-7125	—	—
Stephen Fontis	3800 Hayes	Windsor		969-3232		
Gary Wilson	2600 Airport Rd. Unit 102	Windsor	N8V 1A1	969-3232	gary.wilson@journeyair.com	
Averil Parent	4155 Ojibway Pkwy	Windsor	N9C 4A5	300-2931	aparent@city.windsor.on.ca	
[illegible]	436 Dufferin Pl	Windsor	N9A 6J5	519 969-6711		
Rick Coronado	808 Hall Ave	Windsor	N9A 2M3		rickcoronado@hotmail.com	
Derek Coronado	808 Hall Ave.	Windsor	N9A 2M3		derekcoronado@hotmail.com	
William G. Rankine	2074 Arras Av.	Windsor	N8W 1T5		SAWG RANKE HOTMAIL.com	VAR
Matthew Child	ERCA				mchild@erca.org	* requested PDF of presentation
Bruno Sfalcin	3661 Howard	Windsor	N9E-3N6			
Robert + Lorraine Long	3525 County Rd 42	Windsor	N9A-6S3			
Abe Habib	1051 Stony Brook	Windsor	N9G 2R2	519 796-7410	Thedentguy12003@yahoo.ca	
Alex Huszti	4365 Division Rd	Windsor	N9H 2J3	519 969-678[illegible]	—	
Chris Woodall	620 N. Service Rd E	Windsor	N8X 3T3	519-966-4800	cwoodall@mnsi.net	

Windsor International Airport
Master Plan 2010

Public Information Centre: Monday May 30, 2011

Sign In Sheet

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

THE CITY OF WINDSOR

Name	Address	City	Postal Code	Phone	Email	Initial
Don + Donna Richer	3438 Turner	Windsor	N8W 3M5	519-966-3789	don_donna14@sympatico.ca	DR
Gina Pugsley	4865 RAY RD.	"	N0R 1K0			

YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

THE CITY OF WINDSOR

Windsor International Airport Master Plan 2010

COMMENT SHEET

(Please use back if you require more space)

I WOULD REQUEST SLIDE PRESENTATION THAT YOU HAVE ON DISPLAY. E-MAIL ADDRESS.

I HAVE CONCERNS OF NIGHT OPERATIONS AND THE NOISE OF THE AIRPLANES COMING IN AT NIGHT TIME WHICH COULD CAUSE A PROBLEM FOR THE RESIDENTS IN THE TURNOR RD AREA.

don_donna14@sympatico.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments received will become part of the public record.

Please send your comments by June 13, 2011 to:

Tiffany Pocock, P. Eng, Project Manager
City of Windsor Engineering–Development and Geomatics
350 City Hall Square West, 4th floor,
Windsor, ON. N9A 6S1
tpocock@city.windsor.on.ca

Ron Shishido, RPP, Project Manager
Dillon Consulting Limited
235 Yorkland Boulevard, Suite 800
Toronto, ON M2J 4Y8
rshishido@dillon.ca

YQG | YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

THE CITY OF WINDSOR

Windsor International Airport Master Plan 2010

COMMENT SHEET

(Please use back if you require more space)

very happy with todays presentation very happy we were kept in the loop and all of our concerns were addressed.

Thank you we are also glad that Windsor airport is still expanding nicely with thought to wildlife and surrounding community.

Please send me a copy of the presentation

treequeenshelli@Gmail.com

Thank you again

Michelle Bastien / Jason Lamberton
3526 Riberdy rd
Windsor ont
N8W-3J6

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments received will become part of the public record.

Please send your comments by June 13, 2011 to:

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Ron Shishido, RPP, Project Manager
Dillon Consulting Limited
235 Yorkland Boulevard, Suite 800
Toronto, ON M2J 4Y8
rshishido@dillon.ca

250-6655

YQG | YOUR QUICK GATEWAY

WINDSOR INTERNATIONAL AIRPORT

Windsor International Airport Master Plan 2010

COMMENT SHEET

(Please use back if you require more space)

This was very well done! Thank You for this information session.

Pete Kennedy

519-966-7125

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Please send your comments by June 13, 2011 to:

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YQG YOUR QUICK GATEWAY
WINDSOR INTERNATIONAL AIRPORT

THE CITY OF WINDSOR

Windsor International Airport Master Plan 2010

COMMENT SHEET

(Please use back if you require more space)

- Request for full service Entrance to Airport Grounds to service Intermodgal and airport areas from Jefferson & Rhodes.
- As stakeholders, we request to participate in the planning process.

Terry Aldea.
Canadian Storage.

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments received will become part of the public record.

Please send your comments by June 13, 2011 to:

Tiffany Pocock, P. Eng, Project Manager
City of Windsor Engineering–Development and Geomatics
350 City Hall Square West, 4th floor,
Windsor, ON. N9A 6S1
tpocock@city.windsor.on.ca

Ron Shishido, RPP, Project Manager
Dillon Consulting Limited
235 Yorkland Boulevard, Suite 800
Toronto, ON M2J 4Y8
rshishido@dillon.ca

Forest, Flavio

From: Pocock, Tiffany [tpocock@city.windsor.on.ca]
Sent: Tuesday, May 24, 2011 9:22 AM
To: Forest, Flavio; Shishido, Ron
Subject: FW: vacant land
Follow Up Flag: Follow up
Flag Status: Yellow

Fyi

From: Jim [mailto:jimcooper@sympatico.ca]
Sent: May 23, 2011 5:43 PM
To: Pocock, Tiffany
Subject: vacant land

ONE READS OF THE PLANS BEING DRAWN UP FOR THE VACANT AIRPORT PROPERTY.
ONE SENSES THIS WILL EVOLVE INTO ANOTHER MUNICIPALITY PROJECT OF MORE BUILDINGS,MORE CONCRETE, MORE ASPHALT,PRESUMABLY FOR MORE JOBS,EMPLOYMENT ETC.
IT IS UNFORTUNATE THAT THIS SHORT TERM APPROACH WITH MORE OF THE ABOVE, WILL PROMOTE WINDSOR,ON THE GLOBAL MAP.
MANY YEARS AGO,THE CITY OF NEW YORK,HAD THE FORSITE TO BUILD "CENTRAL PARK"A TREASURE TO THE CITIZENS OF THAT GLOBAL CITY,IN THIS DAY OF BUILDINGS,CEMENT ASPHALT,AND ALL THAT GOES WITH IT.
IF WINDSOR WANTS TO PUT ITSELF ON THE SO CALLED "GLOBAL MAP"MAY I SUGGEST ANOTHER PLAN,ONE THAT WOULD HAVE IT STAND OUT IN HAVING, WINDSORS,"CENTRAL PARK",NEAR AN AREA WHERE VISITORS WILL NOTICE A DIFFERENCE,FROM THE AIR,FROM THE ROAD,
AN AREA OF TREES,PATHS,BIKE WAYS,PONDS ETC,AWAY FROM THE SAME OLD DEVELOPMENT OF THE ABOVE MENTIONED.
WE KNOW WINDSOR IS NO NEW YORK CITY, HOWEVER,IT WOULD SHOW ITSELF, IN NOT FILLING EVERY PIECE OF VACANT LAND WITH THE USUAL INDUSRIAL DEVELOPMENT,AND LEADING TO THE PRIDE OF EXISTING WINDSORITES IN THAT WE DO AND THINK A LITTLE DIFFERENT IN THE WAY WE USE OUR VACANT LANDS,AND COULD BE ADMIRED BY THOSE THAT WANT TO INVEST HERE IN A COMMUNITY WHICH STANDS OUT IN ITS ATTRACTIVENESS,AND FORE THOUGHT OF, NOT YOUR ORDINARY CITY,AND A PLEASANT PLACE TO WORK AND THINKING OF THE FUTURE GENERATION.
THE CITY HAS A CHOICE,AND, HAS THE REALATORS OFTEN DRUM INTO US,"LAND THEIR NOT MAKING ANY MORE OF IT"
HOPEFULLY THE PLANNERS FOR WINDSOR,S WILL HAVE THE FORESITE.

Forest, Flavio

From: Pocock, Tiffany [tpocock@city.windsor.on.ca]
Sent: Thursday, May 26, 2011 9:32 AM
To: Forest, Flavio
Subject: FW: Riberdy Road Resident Concerns
Follow Up Flag: Follow up
Flag Status: Yellow
Attachments: riberdy.jpg; riberdy1a.jpg; riberdy2.jpg; riberdy2a.jpg; riberdymap.gif; antonov_facing_Riberdy.jpg

---

From: J L [mailto:codedelta9@gmail.com]
Sent: May 25, 2011 6:01 PM
To: Pocock, Tiffany
Cc: rshishido@dillon.ca
Subject: Fwd: Riberdy Road Resident Concerns

Hello , We have just received notice of the Open House to view the Windsor airport master plan , Monday May 30 2011, & do not know if our schedule will allow us to attend , therefore I am forwarding an email previously sent to others , that we really haven't had a clear answer on,...
As residents of Riberdy road we are primarily concerned with the development of the last stretch of field behind our homes ,...While we dont know of any plans in place,....Or if this area even can be developed ,....We would be opposed to any development for many reasons , a few of which are outlined below

---------- Forwarded message ----------
From: **J L** <codedelta9@gmail.com>
Date: Sat, Sep 18, 2010 at 12:18 PM
Subject: Riberdy Road Resident Concerns

Hello , after hearing the news that you were part of a tour , on the airport lands I would just like to forward you
this email concerning a very small piece of land behind riberdy road , most residents here can tell you even though this is just a very small field , we also get lots of wildlife here , the occasional deer , coyote ,lots of frogs
snakes etc , anyway most people are concerned that it could be developed & potentially reduce home values ,
most back yards here are so small that even to lose this small field would be a big loss ,
Some of us have contacted various city officials & the airport ,..but have not got any response on what plans may be,.. or how to secure this area as a park & have it left be ,..so we are just giving you a little more info maybe you can use..

Hello , I would like to bring to attention some concerns of Riberdy road residents concerning the future of a piece of land behind Riberdy road,
attached are pictures showing the area defined within the green lines

Historically this area has been farm land & has been,. on some maps designated as "Airport Operating Area" Now that the city owns it , it is actually believed to be zoned "Industrial"

While we are not clear on what the plans are for this land ,
The residents whose yards back on to this small field would respectfully be opposed to development of any type, for many reasons , A few of which which will be outlined here ..

- Windsor Airport currently has & maintains several visual landing aid markers
& associated electrical boxes within this field

-Although this is a small field it provides a beautiful view to the horizon & is one of the strong value points of homes that back onto it ., any development would surely decrease the value that these homes currently enjoy

-Many families from the area use the field for park like uses , walking , pets
& children regularly play there , while there are other parks in the area, children would have to cross walker road to get to them
It also offers a clear view of night sky & is frequented by many small birds rabbits & other wildlife.

-Another factor would be development constraints , the field is landlocked , at the end of 2 runways, & beside a rail line , between the vibration from the trains affecting foundations ,..the lack of access ,& the low approaches of aircraft
it really doesn't make sense to develop anything there at all...

-What the residents would like to see, is it left alone,.. as a field,..
really we don't have enough of them around in the city, & it just doesn't make sense to develop this one , its small but is a beautiful little green space.
A guard rail could be put on foster road to prevent motorized vehicles from from entering it as well as a sidewalk along foster & that's it.
Nothing more would be needed....call it riberdy air park & your done.
It is a quiet street, with a quiet field, & we hope it will stay that way
We just hope in your planning you will consider this & will listen to others in different areas as well , because we feel that it is just not necessary, to develop
every single strip of land one can find ,...especially when these days there are so many vacant properties that could be utilized, & green space is so important to incorporate into the city.

-It also makes sense safety wise to leave it undeveloped ...
Another factor to consider in the vicinity of airport operations is safety & noise,
A buffer zone around the runway & approach areas free of structures & people
makes for a safer environment for everyone & gives that extra margin of area to bleed off speed or stop in if needed , everything from failing engines, poor weather etc can cause lower than usual approaches & runway overruns.
One fairly common problem is a gear up landing ,...this occurs when the landing gear do not fully deploy , in these cases many feel it is usually the safest & best option to actually land gear up in the grass beside the runway,....(if it hasn't been developed of course)

Also From what can be understood by looking at the zoning regulations It really doesn't look like development of this area would be wise..
Windsor Airport & Area Zoning Regulations

And we should remember that sometimes accidents do happen
imagine the consequences of developed areas in close proximity to runways
when a runway overrun occurs ,would you want to be responsible for putting a road or structure with people in it so close to a runway then?

And so we should remember the incident of an Antonov jet overrunning the runway at Windsor Airport,..... UR-82029, owned by Antonov Airlines overran the runway at Windsor, Ontario while landing at night on December 18, 2000. It stopped 340 feet beyond the runway after landing some 3400 feet beyond the threshold of runway 25, which is 7850 feet long.Although None of the 20 crew were injured, and the plane suffered minor damage.

WestJet Aircraft Slides Off Runway

It does occasionally happen,.....

We thank you for taking the time to listen to some of our concerns
& hope you will take these into account in future planning for the area.

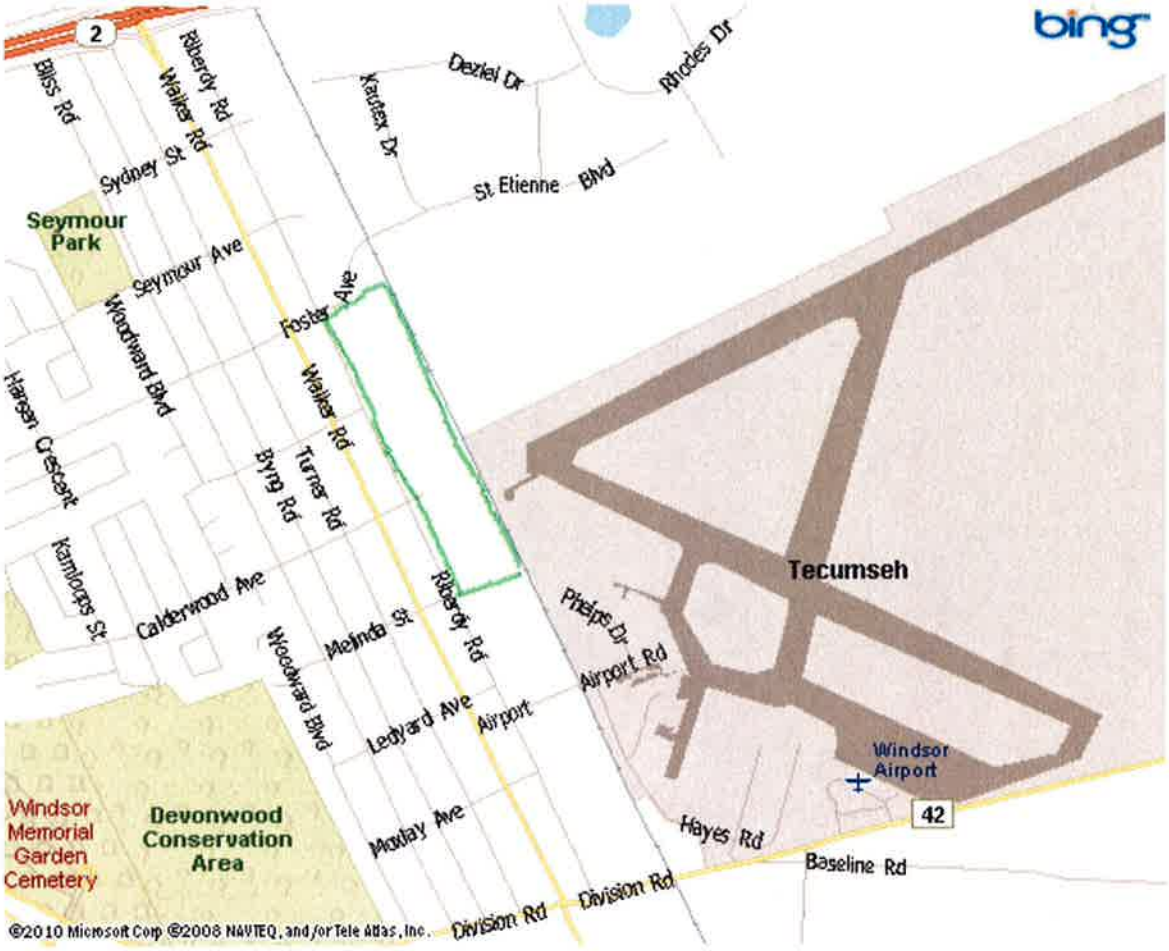
Riberdy Road Residents


N
Google


N
Google


N
Google


N
Google


2
Bliss Rd
Riberdy Rd
Walker Rd
Sydney St
Seymour Park
Seymour Ave
Woodward Blvd
Hansen Crescent
Kamloops St
Calderwood Ave
Foster Ave
Walker Rd
Byng Rd
Turner Rd
Melinda St
Woodward Blvd
Riberdy Rd
Ledyard Ave
Airport
Mowlay Ave
Windsor Memorial Garden Cemetery
Devonwood Conservation Area
Division Rd
Division Rd
Xantiex Dr
Dezkel Dr
Rhodes Dr
St Etienne Blvd
Tecumseh
Phelps Dr
Airport Rd
Windsor Airport
42
Hayes Rd
Baseline Rd
bing
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Stakeholders Requesting Copy of Master Plan

1. Norbert V. Poggio P. Eng. (Email request to T. Pocock on 12 May 2011)

   Director, Water Engineering
   Windsor Utilities Commission
   4545 Rhodes Dr. P.O. Box 1625, Stn. "A" Windsor ON N9A 5T7
   Tel: (519) 251-7300 x295
   Fax: (519) 251-7316
   Mobile: (519) 796-2784
   email: npoggio@enwin.com

2. Jim Cooper jimcooper@sympatico.ca (Email request to T. Pocock on 23 May 2011).

3. Riberdy Road Residents J L codedelta9@gmail.com (Email request to T. Pocock on 25 May 2011).

4. Dan McCulloch Dan.McCulloch@rosatigroup.com (Email request to N. Robertson on 31 May 2011.

5. John Lewis john.lewis@ctv.ca (requested through Federica Nazzani).

6. Sandra Poirier spoirier@craworld.com (requested through Federica Nazzani).

7. Curtis Pope cpope@manofsteelltd.com (requested through Federica Nazzani).

8. Mr. D. Rodzik drodzikjr@narmco.com (requested through Federica Nazzani).

9. Don and Donna Richer, 3438 Turner Road. don_donna14@sympatico.ca (PIC request).

10. Michelle Bastien/Jason Lamberton, 3526 Riberdy Road. treequeenshell@gmail.com (PIC request).

11. Matthew Child, Essex Region Conservation Authority. mchild@erca.org (PIC request).

12. Averil Parent aparent@city.windsor.on.ca (requested through Tiffany Pocock).

13. Jane Mustac jmustac@countyofessex.on.ca (requested through Tiffany Pocock).

14. Councillor Ed Sleiman esleiman@city.windsor.on.ca (PIC request – to be addressed by Tiffany Pocock).

15. Councillor Hillary Payne hpayne@city.windsor.on.ca (PIC request – to be addressed by Tiffany Pocock).

Essex Region Conservation Authority

360 Fairview Avenue West, Suite 311, Essex, ON, Canada, N8M 1Y6 | P 519-776-5209 | F 519-776-8688 | erca.org | ourgreenlegacy.org

June 21, 2011

Ms. Tiffany Pocock, P.Eng.,
Project Administrator
350 City Hall Square West- 4th Floor, City Hall
Windsor, Ontario,
N9A 6S1

Dear Ms. Pocock,

RE: Windsor International Airport Master Plan

Thank you for providing a copy of the Windsor International Airport Master Plan 2010, Draft No.2, dated December 3, 2010. The following comments are offered on behalf of the Conservation Authority.

Ontario Regulation 158/06 Permit and Fisheries Act Authorization Requirements

Each of the drains on the subject lands (the McGill Drain, Lappan Drain, Rusette Drain and Rivard Drain) are Regulated by ERCA's Regulation of Development, Interference with Wetlands and Alteration to Shorelines and Watercourses. Any proposed modifications to these drains will require the proponent to obtain a permit or clearance for alterations to the drains such as the installations of new outlets into the drains, access culverts, enclosures, relocations, etc.

Any proposed modifications to these drains will also require that the proponent undertake an aquatic assessment to determine the feasibility of drain modifications. ERCA has been delegated authority for reviewing and commenting on proposed undertakings under Section 35 of the *Fisheries Act*. Section 35(1) of the *Fisheries Act* stipulates that,

> "no person shall carry on any work or undertaking that results in the harmful alterations, disruption or destruction (HADD) of fish habitat."

Furthermore, a HADD of fish habitat is prohibited unless authorized by the DFO pursuant to subsection 35(2) of the *Fisheries Act*. In keeping with DFO's "Policy for the Management of Fish Habitat", no such authorizations are issued unless acceptable measures to compensate for the habitat loss are developed and implemented by the proponent. Please note that an application for a *Fisheries Act* authorization will trigger a *Canadian Environmental Assessment Act* review process. In addition, the current DFO aquatic

Species at Risk Screening Maps presently identify that the drains on the Airport Lands do not contain aquatic Species at Risk.

Based on the preliminary concept plans, it is recommended that an audit of all of the waterways on the Airport lands be undertaken at this time to determine a compensation strategy for the anticipated drain modifications. In addition, further consideration of a phased authorization and compensation implementation process should be embarked upon. If requested by the City, we will investigate potential phasing options and/or a longer validation period for a *Fisheries Act* authorization.

Stormwater Management

The Master Plan identifies that over 250 hectares of lands on the Airport property are designated "Future Employment Area" to support non-airport related employment and business park uses. Typically, 18-22% of a proposed development is required to be utilized for stormwater management facilities. This may prove insufficient for the nature of stormwater facilities required for the Airport, with the objective of avoiding areas of standing water. Issues relating to storm sewers and overland flow routing should be investigated through a Functional Design which may alter the overall areas required for stormwater management. In addition, the stormwater management facilities cannot be used as compensation for a *Fisheries Act* authorization for the loss of waterways on this site. It should also be noted that stormwater management areas will always be part of the infrastructure requiring maintenance over time and it is necessary to differentiate the natural heritage restoration area from the stormwater management facilities. As well, it is anticipated that stormwater quality controls may need to be addressed through the installation of oil and grit separators within specific catchment areas prior to release of runoff into the stormwater drainage system. This will ensure that stormwater receives appropriate levels of polishing prior to release into the stormwater management facilities that are being considered adjacent to natural heritage features.

Natural Heritage Restoration Opportunities

The natural heritage features located on the airport lands have been evaluated as Provincially Significant Wetlands by the Ministry of Natural Resources. A significant amount of information is known about these features and the City commissioned the Update to the Candidate Natural Heritage Site Inventory which was completed in July of 2008. The Ecological Land Classification Community Types of the three forests are green ash mineral deciduous swamp, silver maple mineral deciduous swamp and mineral cultural thicket. As restoration is proposed to link the three wooded features CNHS Report #39 can be referenced for a complete list of floral species which should be used as a basis for selecting floral species to be planted in the restoration area. A hydrologic assessment to determine the water cycle balance ensuring maintenance of optimal health of these features should be completed as part of the stormwater management design particularly in the event that a serpentine type facility is proposed near this area. We have some concerns relating to the required magnitude and configuration of this facility due to the amount to stormwater runoff which will result from the intensification of development over the long term.

The City of Windsor Official Plan identifies the forests as Natural Heritage and adjacent lands as Open Space. The Master Plan is putting forward a concept to locate municipal infrastructure within the restoration area. We have concerns with respect to the compatibility of the proposed stormwater management facility to the concept of this area being restored to natural environment. Over time various levels of maintenance and repair to stormwater management facilities may be required. This maintenance and repair is active construction and may end up necessitating the removal of trees/shrubs that would be encouraged in the natural environment. Lands that are either restored and/or naturalized within this area will inevitably function as a significant natural heritage feature over time due to its proximity to the existing provincially significant wetlands and any species at risk populations in the area. Further consideration should be given to this potential future conflict between protecting natural heritage features and undertaking regular maintenance to municipal infrastructure.

An endangered species has been identified on the Airport Lands. Natural Heritage Information Centre Records identify that at least one population of an endangered snake has been known to exist at the Windsor Airport since the 1970's. The protection of the significant habitat of this species is required based on the Provincial Policy Statement. Suitable corridors for the snakes' movement should also be provided. During the preparation of Natural Heritage Reports for the Windsor Annexed Area in 2003, it was identified that the Airport Woodlots would benefit from the preparation of a management plan. To our knowledge this management plan has never been completed however this information would be helpful for the City in determining appropriate management objectives for these very significant natural heritage features.

Source Protection Planning Considerations

It is noted that the Master Plan identifies the intent to "develop a bulk fuel storage facility on a lot in the employment lands". The recent work of the Essex Region Source Protection Committee has identified that the storage of large volumes of fuel is considered to be a 'significant threat' to source water quality at the intakes of some of the water treatments plants in the Region, if such facilities are located with-in mapped 'Intake Protection Zones'. Specialized modelling studies of simulated fuel spills in the upper reaches of tributary waterways, have shown that benzene could reach the municipal water intakes at concentrations substantially higher that the Ontario Drinking Water Quality Standard, which is the threshold for the identification of 'Significant Threats'. The Intake Protection Zones ('IPZ-3s' in this case) associated with the A.H. Weeks Water Plant in the City of Windsor which have been mapped through these special studies, include those areas within floodplains, or within 120m, of all tributaries of Little River and other nearby watersheds, or within the floodplains of these waterways.

Based on the requirements of the Province of Ontario's *Clean Water Act*, 'significant threats' such as large fuel storage facilities will require policies in the Source Protection Plan, to ensure that the threat is managed so that the risk of large spills from such facilities is minimized. The Source Protection Plan for the Essex Region is currently being developed by the Source Protection Committee in consultation with municipalities and others, and is expected to be completed by summer 2012.

Through the City's representatives on the SPC, (Thom Hunt and Mario Sonego), information regarding draft policy considerations will be available during the balance of this year and into 2012. It would be helpful if information is available regarding the potential volumes and types of fuel to be stored in these tanks. Depending on these details, and if the large fuel storage facilities are to be located within 120m of waterways or the floodplain of the Little River, they will likely be subject to the policies for fuel storage in the Source Protection Plan. We have attached a map of the IPZ-3 area for your reference.

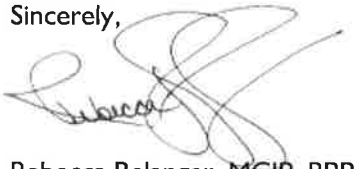
Although the Source Protection Plan policies have not yet been developed, and will not take effect until sometime after summer 2012, the City may find it helpful to consider the draft information as it becomes available, as it may be of assistance with respect to the planning and design of large fuel storage facilities on the Airport lands. Even if the fuel tanks are located beyond 120m of the waterways or the floodplain of the Little River on the Airport Lands and the, the City may wish to utilize the policies from the Source Protection Plan applicable for large scale fuel storage. For your consideration, we also offer the suggestion of site specific modelling of a simulated spill from the proposed large fuel storage at the Airport to determine the impact that this could have on the water quality at the downstream water-intake. If the City wishes to undertake such a study, we would be pleased to assist with respect to the scope, methodology, etc. building on the similar studies which we have completed to date. The results from such a modelling study may provide valuable information which could potentially assist the municipality in taking a proactive approach to site layout or other considerations, for large scale fuel storage.

We note that the Master Plan also identifies the intent to develop a designated aircraft de-icing area as operations increase in the future. The storage and handling of Aircraft De-icing Fluid is also included in the list of Prescribed Threats to Drinking water Sources as specified by the Ministry of the Environment. Studies have not yet been undertaken regarding the potential effects of such facilities with respect to the source water at the A.H. Weeks Water Plant. All such studies through the Source Water Protection Program have been put on hold by the MOE at this time, pending completion of the first Source Protection Plan in 2012, based on the studies completed to date. However, we suggest that the City may also wish to consider a study to model a hypothetical spill based on the anticipated amount of aircraft de-icing to be stored on site to determine what type of impacts this could have on the water quality at the downstream water intake, and whether any extra mitigating measures might be advisable. We would be pleased to assist the City with respect to the study scope and methodology, etc., again building on the similar studies which have been recently completed through the Source Water Protection Program.

There has been an inference that approvals will not be required from the Conservation Authority for development within Regulated Areas under Section 28 of the *Conservation Authorities Act*. This inference requires clarification and regardless of this, we request the opportunity to continue to review submissions and participate in the preparation of Functional Design for Stormwater Management and, based on our delegated responsibilities with the Department of Fisheries and Oceans, we will participate in all aspects of the biological assessment for the waterways assessing fish habitat.

Thank you for the opportunity to comment on the draft Master Plan for the City Airport Lands. We would be pleased to continue our involvement in the review process and request information relating to future public meetings or drafts of the Master Plan.

Sincerely,



Rebecca Belanger, MCIP, RPP,
Conservation Planner

c./ Thom Hunt, City Planner
Mario Sonego, City Engineer
France Isabelle-Tunks, Senior Manager of Infrastructure Coordination and Development

DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

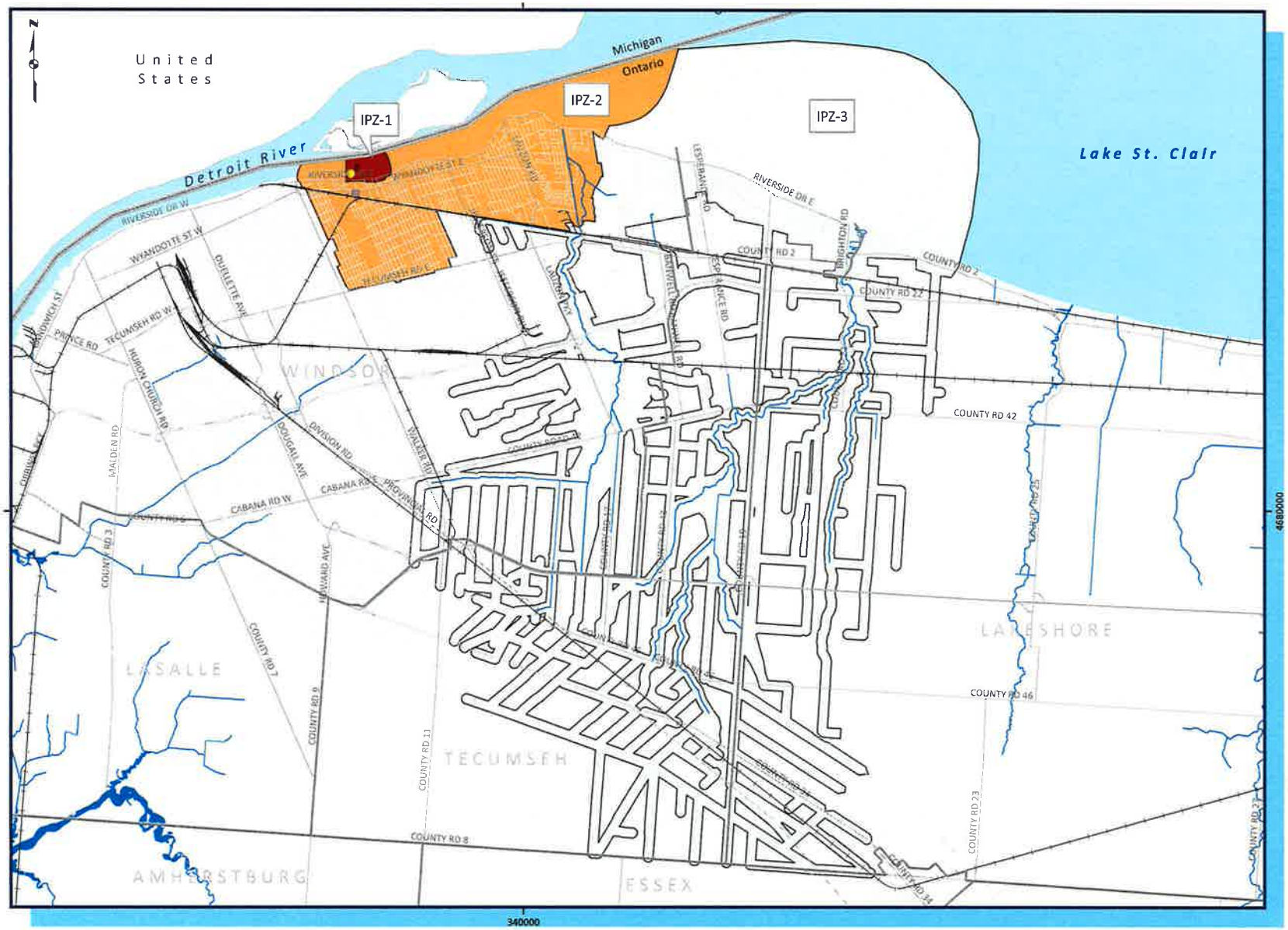
A. H. Weeks (Windsor) Water Treatment Plant East Intake IPZ 1, 2 and 3

1:90,000

0 3 Kilometers

Made possible by the Government of Ontario

Ontario



Essex Region Source Protection Area Assessment Report Map 4.24b

Legend

- Intake - Type B
- Drinking Water System
- Municipal, Lower Tier
- International Boundary
- Road
- Railway
- Water and Drainage
- Water Body

Intake Protection Zones

- IPZ-1
- IPZ-2
- IPZ-3

This publication was produced by:

Essex Region Conservation Authority
360 Fairview Avenue West
Essex, ON N8M 1Y6

Sources: ERCA, County of Essex, City of Windsor, MNR, MOE, Stantec Consultants, StatsCanada

Map Produced in Co-Operation with the Province of Ontario and Conservation Ontario

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Essex Region Conservation Authority (ERCA) shall not be liable in any way for the use of, or reliance upon, this map or any information contained herein.

Map Projection & Datum: UTM NAD83 Zone 17N

Windsor Essex County Environment Committee

Council Services Department
350 City Hall Square West, Room 203
Windsor, Ontario N9A 6S1

Attention: Tiffany Pocock
City of Windsor Engineering Department
350 City Hall Square West
Windsor, Ontario N9A 6S1

July 9th, 2011

Re: The Windsor International Airport Master Plan 2010

Dear Tiffany,

The subcommittee found the goals of the Windsor International Airport Master Plan overly ambitious. The projections seem unrealistic given the emerging impact of peak oil and airplane fuel costs, the uncertain future growth of air transport of commercial goods and related impacts to the industry. However, technology's response to future needs is also an unknown.

The recommendations on existing services seem reasonable however the subcommittee would like to see the noise exposure forecast (NEF) explained in more details given the diagram of the NEF and the reference to complaints and legal action for 40 NEF. *The subcommittee would like to have that component of the plan explained in more detail if possible.*

The subcommittee also noted the lack of recognition between airport and land transportation (buses, cars, taxis, shuttles). Certainly, if the projections of the plan are actually met, land transport access will increase significantly. However, given the scale of the plans this is not a great concern at this time.

The subcommittee was pleased to see the clear demarcation of the now confirmed PSW wood lots and the 120 meter buffer around the woodlots.

Sincerely,

Frank Butler
WECEC Transportation subcommittee