

October 20, 2021

White Oaks Resort & Spa
253 Taylor Road
Niagara-on-the-Lake, ON L0S 1J0



Attention: Timothy Collins – President, LANDx Developments

**RE: White Oaks Resort & Spa Master Plan – 253 Taylor Road, Niagara-on-the-Lake
Airport Compatibility Review – Final Report**

Dear Mr. Collins,

HM Aero Inc. is pleased to submit the following review of the compatibility considerations associated with the proximity of 253 Taylor Road, Niagara-on-the-Lake to Niagara District Airport. A master planning process is currently underway to identify the feasibility of the above-noted property being intensified through redevelopment to support mixed-use residential and commercial land uses. Building on the findings of the September 24, 2021 review of the St. Catharines Airport Zoning Regulations, this report has been prepared to analyze:

1. Height limits associated with regulatory and operational considerations;
2. Potential interference with electronic systems and Instrument Flight Procedures;
3. Bird hazards;
4. Noise considerations;
5. Restrictions to visibility; and
6. To provide preliminary commentary on the merit of pursuing a permanent Airport Zoning Regulation exemption.

Thank you for the opportunity to support your team in the ongoing master planning process for the potential redevelopment of the White Oaks Resort & Spa property. We trust that this submission will adequately support your ongoing planning efforts. If you have any questions about the analysis or commentary provided herein, please do not hesitate to contact the undersigned.

Sincerely,

HM Aero Inc.

A handwritten signature in black ink, appearing to read 'Ben Crooks', written over a horizontal line.

Per: Ben Crooks, RPP, MCIP
Planner – Aviation

cc: Brendan Graham, LANDx Developments
Adam Martin, HM Aero



White Oaks Resort & Spa
253 Taylor Road, Niagara-on-the-Lake

Airport Compatibility Review
Final Report | October 20, 2021

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Cover image: Google Earth



1 INTRODUCTION

HM Aero Inc. (the “Project Team”) has been retained by LANDx Developments (“LANDx”) on behalf of the White Oaks Resort & Spa to conduct a review of the compatibility considerations associated with the proximity of 253 Taylor Road, Niagara-on-the-Lake (the “Subject Property”) to Niagara District Airport (the “Airport”). The Airport is a Transport Canada-certified facility located in the Town of Niagara-on-the-Lake that is managed by the Niagara District Airport Commission on behalf of the City of Niagara Falls, City of St. Catharines, and Town of Niagara-on-the-Lake.

A master planning process is currently underway to identify the feasibility of the Subject Property being intensified through redevelopment to support mixed-use residential and commercial land uses. TP1247 – Land Use in the Vicinity of Aerodromes (9th Edition) provides Transport Canada’s guidance on compatibility considerations for development near airports. Based on the guidance material of TP1247, this report has been prepared to analyze:

1. Height limits associated with regulatory and operational considerations;
2. Potential interference with electronic systems and Instrument Flight Procedures;
3. Bird hazards;
4. Noise considerations;
5. Restrictions to visibility; and
6. To provide preliminary commentary on the merit of pursuing a permanent Airport Zoning Regulation exemption.

Throughout this report, calculations are made using elevations and vertical clearances. The following elevations are assumed for analysis purposes:

- The elevation of the Subject Property is 121 m / 397 ft. Above Sea Level (ASL) – however, it is noted that the actual elevation of the site varies between 121 m and 116 m ASL;
- The elevation of the Airport is 95 m / 312 ft. ASL, in accordance with the St. Catharines Airport Zoning Regulations and Airport Operations Manual; and
- The traffic circuit altitude is 403 m / 1,322 ft. ASL per the Canada Flight Supplement.

2 DEVELOPMENT HEIGHT LIMITS

The developable envelope of the Subject Property must consider the degree to which adequate vertical clearance can be provided for aircraft operations. The regulatory height limits of the Subject Property are established through the St. Catharines Airport Zoning Regulations and the Obstacle Limitation Surfaces of TP312 – Aerodrome Standards and Recommended Practices, to which the Airport is certified. Commentary is also provided on operational considerations associated with aircraft maneuvering in the vicinity of the Airport.

2.1 St. Catharines Airport Zoning Regulations

The implications of the St. Catharines Airport Zoning Regulations (SOR/84-901) on the Subject Property were previously reviewed by the Project Team¹. As noted in the Project Team’s September 2021 submission, the entirety of the Subject Property is located within the designated Outer Surface of the Airport Zoning Regulations (AZRs), as shown in Figure 2.1. The elevation of the AZR Outer Surface is 140 m ASL (459 ft. ASL), and all temporary and permanent buildings, structures, and objects on the Subject Property are limited to this height. This includes cranes and other temporary equipment used during the construction process. Accordingly, the AZR Outer Surface restricts the developable envelope of the site to 19 m Above Ground Level (AGL) (62 ft. AGL).

Figure 2.1 - Airport Zoning Regulations Outer Surface

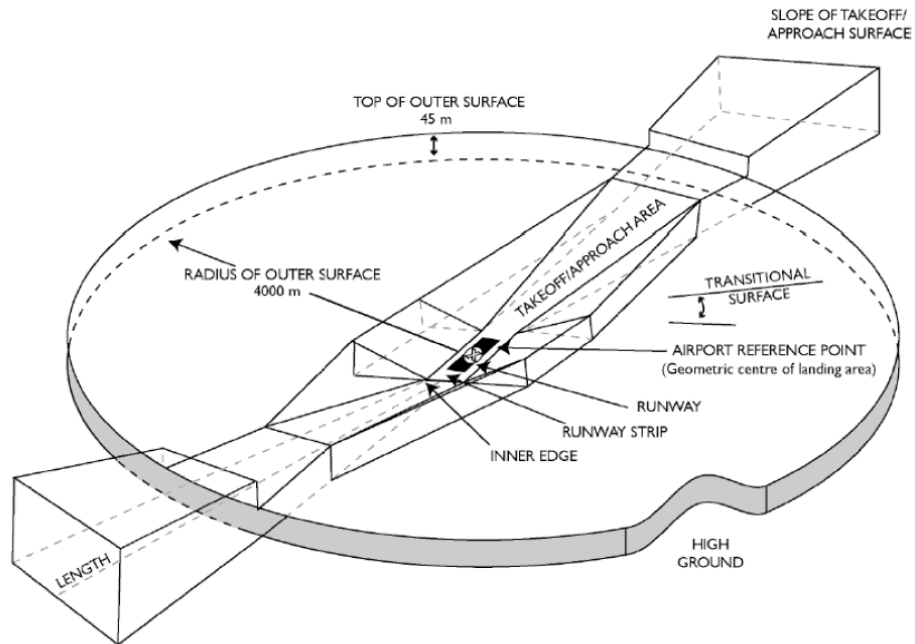


¹ HM Aero Inc. (2021, September 24). *White Oaks Master Plan – 253 Taylor Road, Niagara-on-the-Lake. Review of St. Catharines Airport Zoning Regulations.*

2.2 TP312 Obstacle Limitation Surfaces

Obstacle Limitation Surfaces (OLS) are three-dimensional planes established pursuant to the regulatory standards of TP312 – Aerodrome Standards and Recommended Practices that define the airspace to be maintained free from obstacles to protect for safe aircraft operations. As a Transport Canada-certified airport, Niagara District Airport must be maintained in compliance with the regulatory standards outlined in TP312. The specifications of the Airport's OLS are identified in its Airport Operations Manual, which was reviewed by the Project Team.² Based on the information available to the Project Team, it is understood that the Airport's OLS are certified to the 4th Edition of TP312.

Figure 2.2 - Sample Obstacle Limitation Surfaces (TP1247)



The Runway 01 Approach OLS extends along the runway centreline at a vertical slope of 5% (2.86°) and lateral divergence of 10% (5.71°) to the point where it meets the Outer OLS³. As shown in Figure 2.3, the Runway 01 Approach OLS ceases to be the limiting Surface 2,455 m northwest of the Subject Property, at its point of meeting the Outer OLS. Past this point, the Outer OLS becomes the controlling Surface.

The TP312 Outer OLS is a 4,000 m common plane originating from the Aerodrome Reference Point at a constant elevation of 140 m ASL (459 ft. ASL). As shown in Figure 2.4, the TP312 Outer OLS penetrates 180 m into the Subject Property. Within the areas affected by the TP312 Outer OLS, development is restricted to 19 m AGL (62 ft. AGL). The balance of the Subject Property is located beyond the TP312 Outer OLS, although as noted previously, this area is affected by the AZR Outer Surface.

² The following material was provided to HM Aero previously: Niagara District Airport. (2018, May 4). *Airport Operations Manual (Amendment 7)*. Consultation with the Niagara District Airport Commission is recommended to verify that the Obstacle Limitation Surfaces have not changed from the reviewed material.

³ Per the Airport Operations Manual, the Runway 01 Approach OLS extends for 2,500 m. However, the Outer OLS is the more constraining vertical surface past the point where the two Surfaces intersect.

Figure 2.3 - Runway 01 TP312 Approach Obstacle Limitation Surface

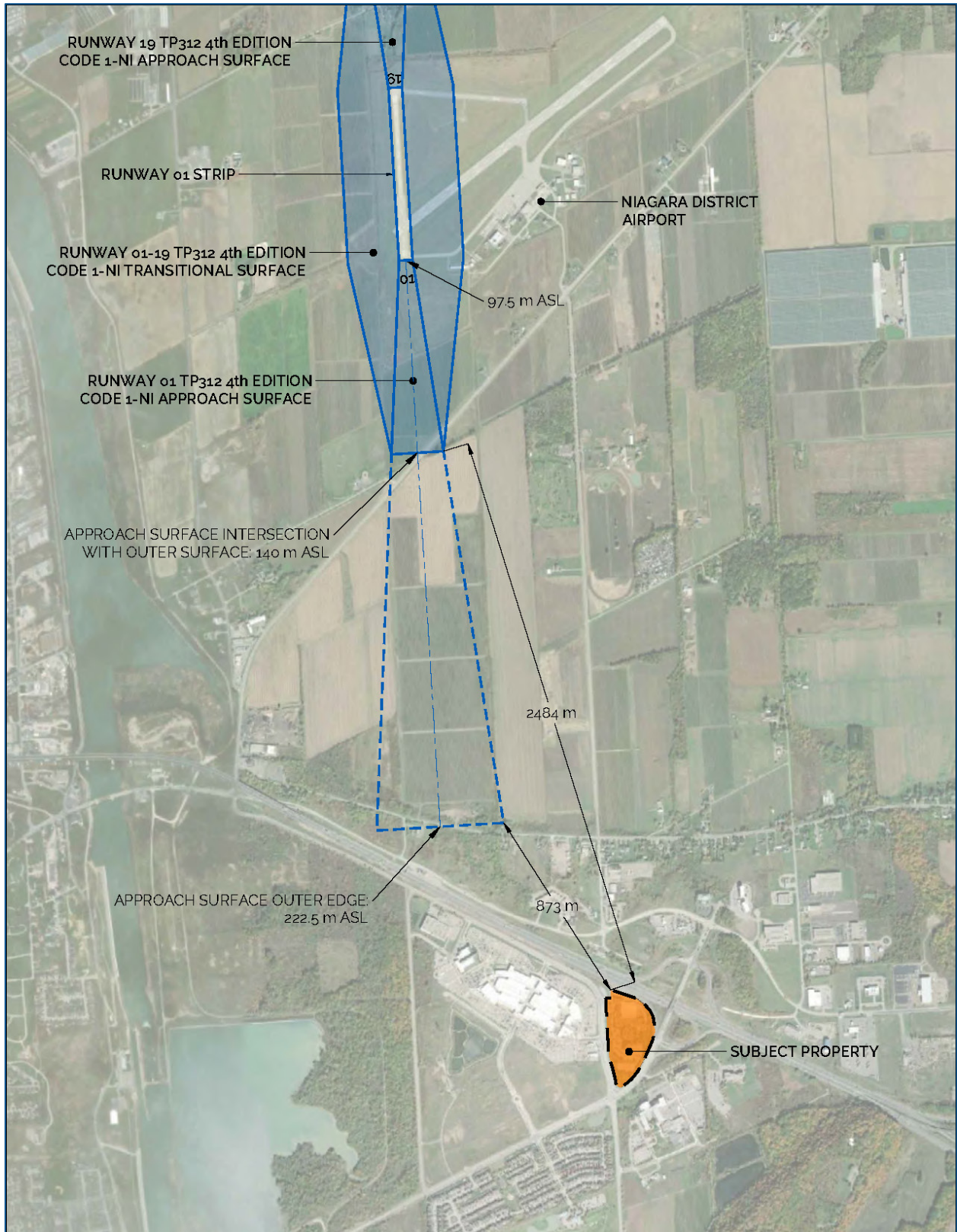
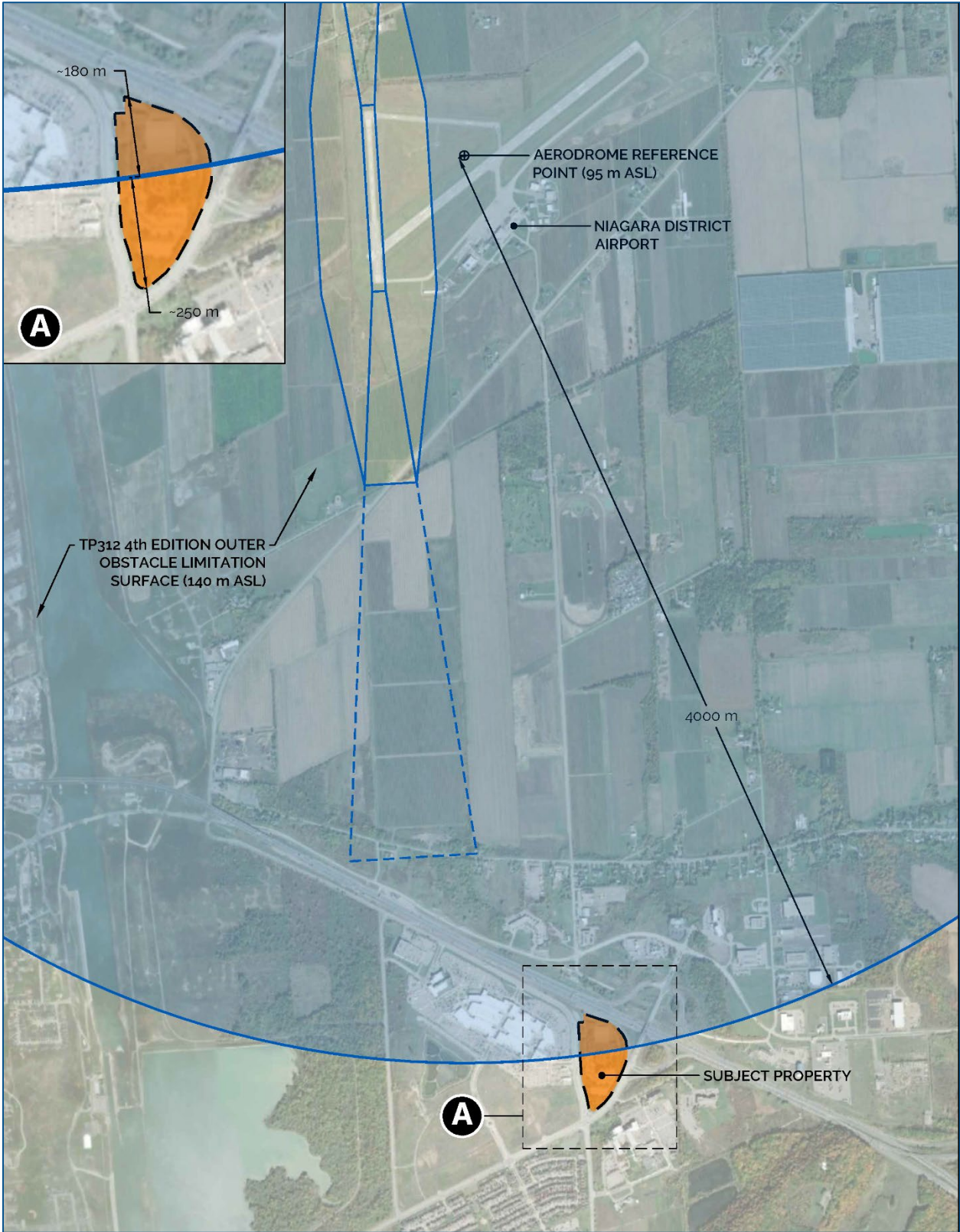


Figure 2.4 - TP312 Outer Obstacle Limitation Surface



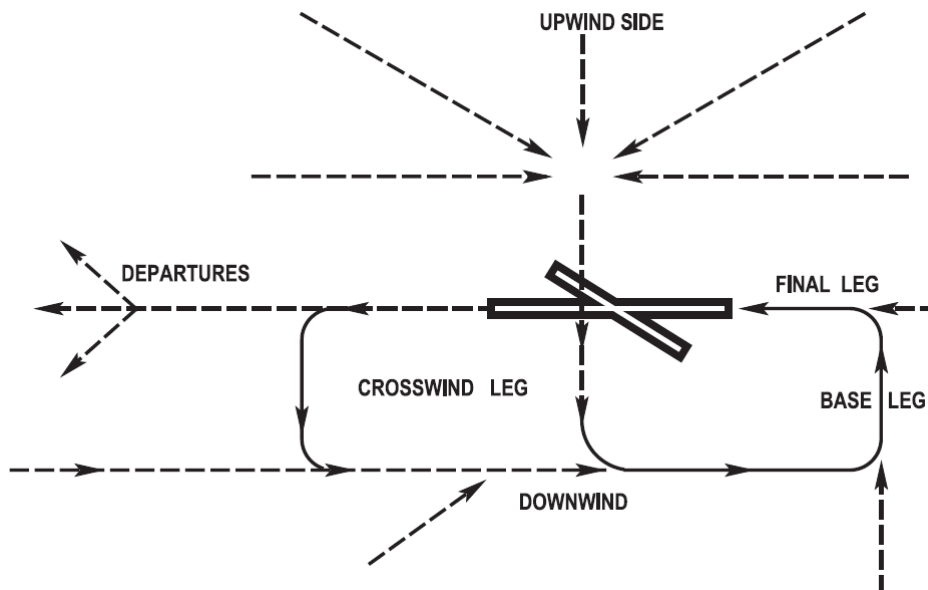
2.3 Operational Considerations

2.3.1 Airport Traffic Circuits

Pilots operating under Visual Flight Rules (VFR) fly by means of visual reference to the ground. While operating VFR, pilots are responsible for obstacle identification and avoidance. Pilots operating VFR at an aerodrome follow traffic circuits that are standardized nationally to ensure a predictable and safe flow of aircraft. Left-hand traffic circuits are defined for aircraft operating at the Airport on Runways 06-24, 01-19, and 11-29. The Airport's traffic circuit altitude is 1,322 ft. ASL and consists of the following legs, as described below and shown in Figure 2.5:

1. Upwind / Departure: The leg flown after take-off while the aircraft climbs away from the aerodrome. The turn from the upwind to crosswind leg is typically initiated approximately 500 ft. above the Airport;
2. Crosswind: The path flown perpendicular to the upwind leg;
3. Downwind: The path flown parallel to and in the opposite direction of the landing runway at 1,000 ft. AGL. Depending on pilot technique, aircraft may begin descending towards the end of the downwind leg;
4. Base: The path flown perpendicular to the downwind and final approach legs while descending to the runway; and
5. Final: The path flown in the direction of the landing runway, culminating in the landing.

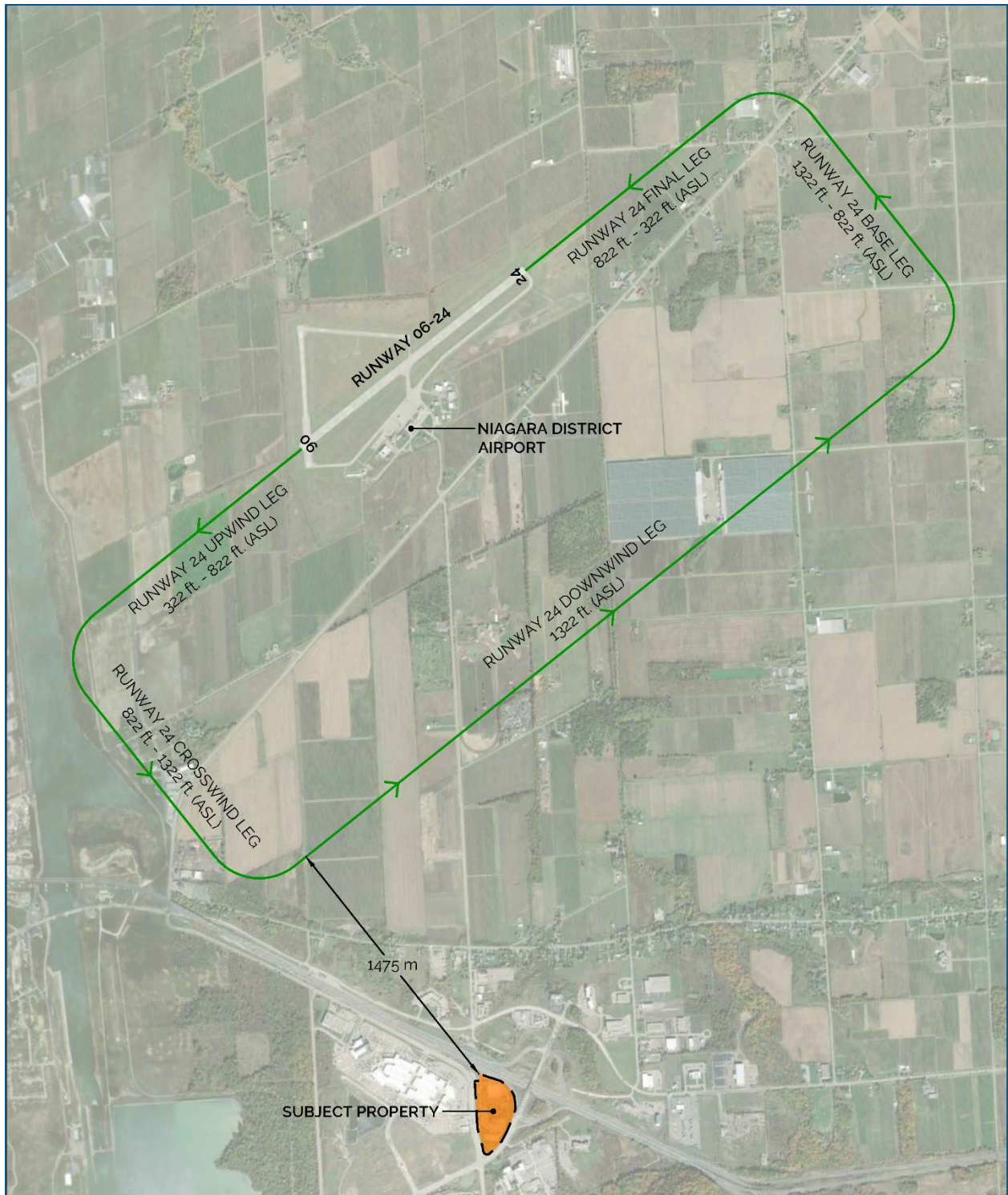
Figure 2.5 - Standard Left-Hand Traffic Circuit



While the various legs of the traffic circuit, direction of flight, and altitude are standardized, the geographic extents of the circuit vary according to aircraft performance, meteorological conditions, pilot technique, and traffic separation requirements, among other factors. To illustrate the relationship between the Airport's traffic circuits and the Subject Property, representative traffic circuits are shown for Runways 24, 01, and 19 in Figure 2.6 and Figure 2.7. The circuit paths have been calculated using the performance characteristics of a 1979 Cessna 172N, a representative general aviation and flight training aircraft that commonly operates at the Airport.

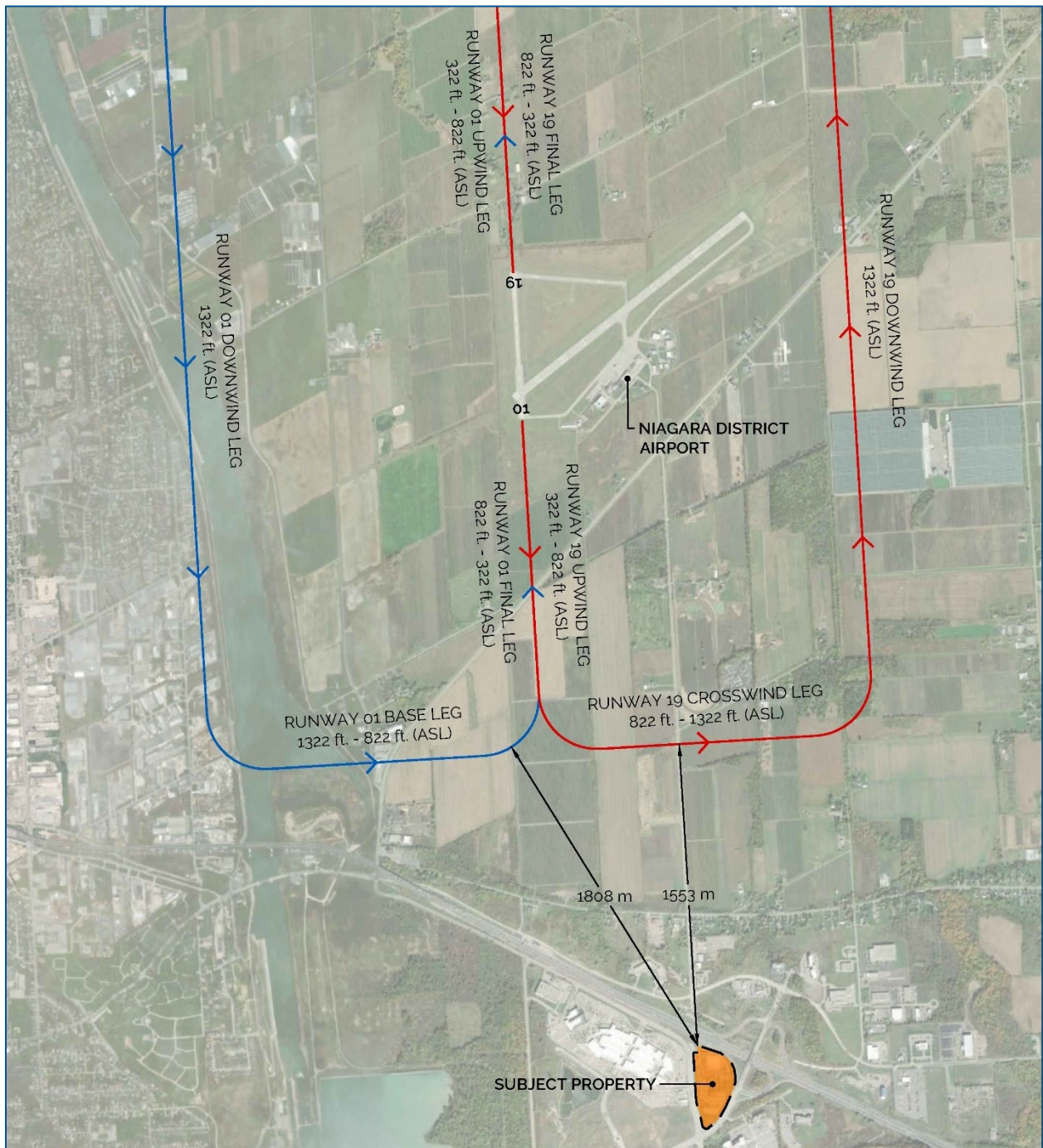
As shown in Figure 2.6, the Subject Property is located 1,475 m from the illustrative Runway 24 downwind leg. Aircraft operating in the Runway 24 traffic circuit at their closest proximity to the Subject Property would be established at the circuit altitude of 1,322 ft. ASL (403 m ASL), or 925 ft. (282 m) above the elevation of the Subject Property.

Figure 2.6 - Runway 24 Illustrative Traffic Circuit



The Subject Property is located 1,808 m from the point at which aircraft would be turning from their base to final leg in the illustrative Runway 01 traffic circuit (Figure 2.7). At this point, aircraft would be established in their descent from the traffic circuit altitude and would be operating at approximately 800 ft. ASL (244 m ASL). The Subject Property is also located 1,553 m from the crosswind leg of the illustrative Runway 19 traffic circuit, as shown in Figure 2.7. At this point, aircraft would be climbing to the traffic circuit altitude and would be between approximately 800 ft. ASL (244 m ASL) and 1,322 ft. ASL (403 m ASL).

Figure 2.7 - Runway 01-19 Illustrative Traffic Circuits



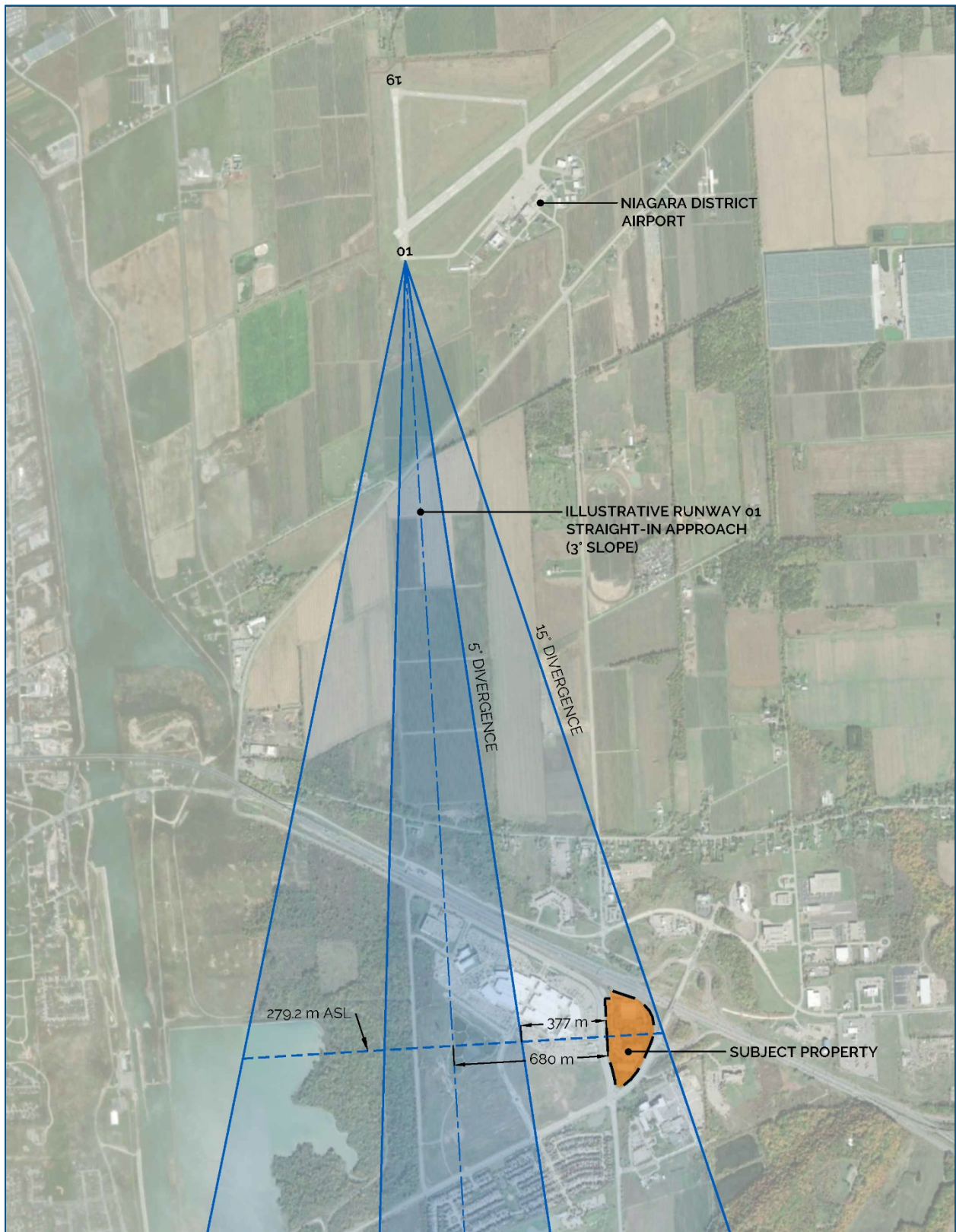
While factors such as variable pilot technique and traffic separation requirements may change the shape and size of the traffic circuits flown at the Airport, between 1,400 m and 1,800 m of horizontal separation is provided between the Subject Property and the three closest illustrative traffic circuits. Aircraft at these points are typically operating at or above 800 ft. ASL (244 m ASL), and in the closest traffic circuit (Runway 24 left-hand circuit) aircraft would be at 925 ft. / 282 m above the elevation of the Subject Property. Pilots operating VFR in the traffic circuit are required to maintain appropriate obstacle clearance. Accordingly, aircraft in the Runway 01, 19, and 24 left-hand traffic circuits are not anticipated to experience operational constraints as a result of redevelopment on the Subject Property.

2.3.2 Arrivals and Departures

As shown in Figure 2.8, aircraft operating on an illustrative straight-in final approach to Runway 01 (i.e., arriving from the south without joining the traffic circuit) would pass 680 m horizontally from the Subject Property, assuming no deviation to the left or right of the extended centreline. Allowing for a 5° divergence to the east of the extended centreline, an arriving aircraft would pass 377 m horizontally from the Subject Property. Assuming aircraft remain on or above a typical 3° approach path, an aircraft perpendicular to the Subject Property would be at an altitude of 916 ft. ASL (279 m ASL), or 519 ft. (158 m) above the elevation of the Subject Property. It is also noted that 3° approach paths are typical of aircraft following established Instrument Approach Procedures; an aircraft arriving VFR may fly an approach that is on or above a 3° slope.

Similarly, an aircraft on an illustrative straight-out departure from Runway 19 would pass within 680 m laterally of the Subject Property – vertical clearances would vary with aircraft performance but would be expected to meet or exceed the clearances described with reference to an arriving aircraft on a 3° approach path. Further, pilots whose next waypoint is not to the south may choose to make their enroute turn to the west, north, or east prior to the Subject Property once established at a safe altitude, potentially increasing separation.

Figure 2.8 - Runway 01 Illustrative Straight-In Approach



3 TELECOMMUNICATIONS AND ELECTRONIC SYSTEMS

3.1 Radar Systems

The NAV CANADA Flight Service Station is not equipped with Primary Surveillance Radar, Secondary Surveillance Radar, or Precision Approach Radar. Accordingly, no compatibility constraints are anticipated per Section 2.2.1 of TP1247. Furthermore, weather radar system installations are not located within 300 m of the Subject Property, and no compatibility constraints are anticipated per Section 2.2.2 of TP1247.

3.2 Communication Systems

The NAV CANADA Flight Service Station located at the Airport is collocated with a radio transmitter / receiver installation. The Subject Property is located further than 300 m from the Flight Service Station and its communication systems, and accordingly does not require assessment per Section 2.3 of TP1247.

3.3 Navigation Aids

Two ground-based electronic navigation aids support aircraft operations at the Airport: a Very High Frequency Direction Finding System and a Non-Directional Beacon.

3.3.1 Very High Frequency Direction Finding System

A Very High Frequency Direction Finding System (VHF/DF) is operated by NAV CANADA's Flight Service Station. The VHF/DF antenna array is situated on the Airport property south of Runway 11-29, near the Aerodrome Reference Point. Accordingly, the Subject Property is not located inside the 365 m area within which structure limitations apply, and a compatibility constraint is not anticipated per Section 2.4.3 of TP1247. VHF/DF services at the Airport were scheduled to be decommissioned by NAV CANADA on October 7, 2021 – accordingly, this unit will no longer present compatibility constraints.

3.3.2 Non-Directional Beacon

A Non-Directional Beacon (NDB) is located at the property municipally addressed as 184 St. Paul Street W in St. Catharines (N43°08'49" W079°15'17"), near the VIA Rail station. The NDB is located approximately 7 km west of the Subject Property and would therefore not require assessment per Section 2.4.2 of TP1247.

3.4 Instrument Flight Procedures

Two GPS-based Instrument Approach Procedures (IAPs) are published in the Canada Air Pilot for the Airport to support aircraft operating under Instrument Flight Rules (IFR), without visual reference to the ground:

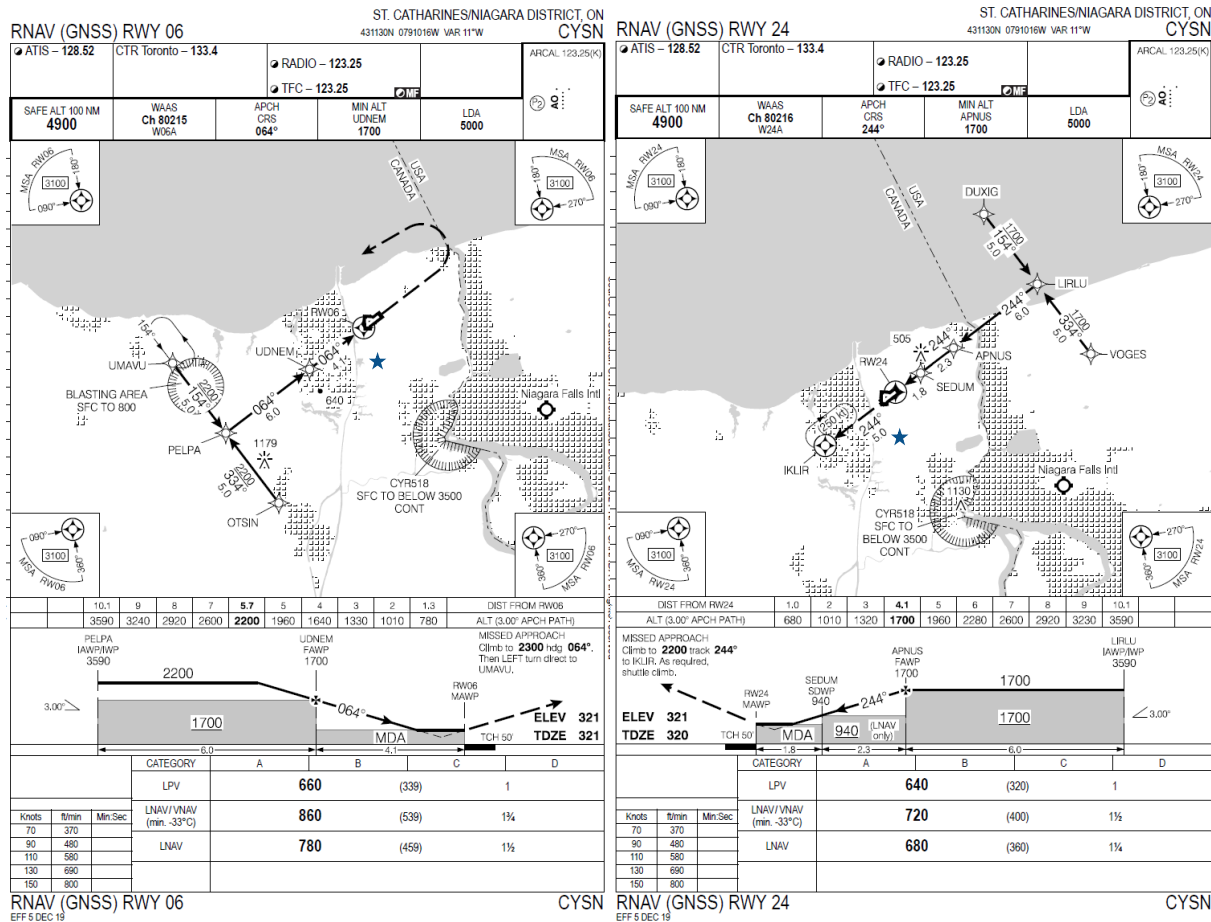
1. RNAV (GNSS) RWY 06 supports aircraft arriving from the southwest on Runway 06; and
2. RNAV (GNSS) RWY 24 supports arrivals from the northeast on Runway 24.

As shown in Figure 3.1, the Subject Property is located to the south of the arrival and missed approach paths of both IAPs. NAV CANADA is responsible for assessing impacts to IAPs resulting from obstacles in the vicinity, with such calculations subject to numerous interrelated factors, including the development height proposed.

Preliminary consultations indicate there will likely be no constraints imposed on the Subject Property as a result of published IAPs; however, this will need to be confirmed through the preparation of a NAV CANADA Land Use Submission with a proposed height provided for assessment.

Instrument departure procedures for Runways 01, 06, 19, and 24 have heading ranges established to avoid aircraft penetrating restricted airspace to the southeast, over Niagara Falls (CYSR-518). Impacts and compatibility considerations with respect to instrument departure procedures will be assessed by NAV CANADA through the Land Use Submission process.

Figure 3.1 - Runway 06 and Runway 24 Instrument Approach Procedures



Note: Approximate location of the Subject Property is shown in blue. Not for navigation purposes.

4 BIRD HAZARDS

Certain land uses have the potential to attract birds that can pose a hazard to aircraft if a collision occurs. Bird hazards are greater closer to airports as aircraft operate at lower altitudes and are in critical phases of flight (i.e., take-off and landing). Primary Hazard Zones are defined within TP1247 as airspace within which aircraft are at or below 1,500 ft. AGL – as noted in Section 2, aircraft in the vicinity of the Subject Property commonly operate within this altitude range. Accordingly, the Subject Property is deemed to be located within a Primary Hazard Zone.

TP1247 notes that residential land uses have a limited risk level and are acceptable within Primary Hazard Zones. Other complementary land uses, such as commercial spaces and restaurants, are noted to have low risk levels, but may be incompatible within a Primary Hazard Zone – however, appropriate bird hazard mitigation measures (e.g., covered garbage enclosures) can be implemented to further reduce this risk to an acceptable level

Section 6 of the AZRs states that lands within the boundaries of the Regulations shall not be used for the disposal of waste that is edible or attractive to birds. This provision should be satisfied through the provision of enclosed garbage storage, which is typical of the type of mixed-use development contemplated for the Subject Property. Given the residential, commercial, and related land uses being contemplated and the availability of risk mitigation measures, bird hazards are not anticipated to result in significant compatibility constraints.

5 AIRPORT NOISE

Noise from aircraft operations has the potential to disturb sensitive land uses, including residential dwellings. In Ontario, land use decisions must be consistent with the Provincial Policy Statement, per Section 3(5) of the Planning Act. The current Provincial Policy Statement came into force and effect in 2020 and provides planning direction for matters deemed to be of provincial interest. Recognizing the importance of airports and the impacts that nearby land uses can have, Policy 1.6.9.2 states that:

Airports shall be protected from incompatible land uses and development by:

- a) prohibiting new residential development and other sensitive land uses in areas near airports above 30 NEF/NEP;*
- b) considering redevelopment of existing residential uses and other sensitive land uses or infilling of residential and other sensitive land uses in areas above 30 NEF/NEP only if it has been demonstrated that there will be no negative impacts on the long-term function of the airport; and*
- c) discouraging land uses which may cause a potential aviation safety hazard.*

The 30 NEF/NEP identified in Policy 1.6.9.2 is a reference to Transport Canada's guidelines for airport compatible land use planning and Noise Exposure Forecast system. To the understanding of the Project Team, Noise Exposure Forecast (NEF) or Noise Exposure Projection (NEP) contours have not been prepared or are no longer available for the Airport to guide land use planning decisions. Accordingly, the Subject Property cannot be assessed relative to the 30 NEF / NEP contour described in Policy 1.6.9.2 of the Provincial Policy Statement, nor the land use acceptability guidance provided by Transport Canada in Section 4 of TP1247.

The Project Team has considerable experience with preparing NEF models for airports similar in their operational scale to Niagara District Airport, as well as larger commercial facilities such as Winnipeg International Airport. While the exact location of the Subject Property relative to the NEF contours of the Airport cannot definitively be verified without the preparation of such contours, it is the Project Team's opinion that the contours associated with Runways 01-19 and 06-24 are unlikely to affect the Subject Property. This opinion is based on the distance of the Subject Property from the Runway 01 threshold (approximately 3.5 km) and the general aviation traffic that predominantly uses Runway 01-19. Furthermore, noise impacts on the Subject Property related to traffic on the Queen Elizabeth Way (QEW) are likely to be more significant compared to aircraft noise.

6 RESTRICTIONS TO VISIBILITY

Part V of TP1247 notes that restrictions to visibility can limit aircraft operations. Specifically, uses that generate smoke, dust, and / or steam in sufficient levels to affect visibility at or near aerodromes should be assessed. As described in TP1247, uses that result in restrictions to visibility are primarily industrial, manufacturing, or power generation oriented in their nature, such as steel mills, incinerators, cement plants, and power generating plants. The residential, commercial, and retail land uses being considered for the Subject Property are unlikely to result in significant restrictions to visibility that would negatively impact aircraft operations at the Airport.

7 PRELIMINARY COMMENTARY ON AIRPORT ZONING REGULATION EXEMPTION

Based on previous discussions between the Project Team and LANDx, it is understood that the maximum developable height for the Subject Property imposed through the AZRs will constrain future planning for the site. Section 5.9(2) of the Aeronautics Act permits the Minister of Transport and Transport Canada to issue an exemption to Airport Zoning Regulations if:

1. The exemption is in the public interest; and
2. The exemption is not likely to adversely affect aviation safety or security.

Provided herein is preliminary commentary on whether both conditions could be met to permit a permanent exemption to the AZRs. The following commentary has been developed independently by the Project Team based on the analyses of the preceding sections. Consultations with, or submissions to, the Niagara District Airport Commission, NAV CANADA, and Transport Canada have not occurred.

7.1 Condition 1 – Public Interest

What constitutes the public interest is not defined within the Aeronautics Act. The degree to which the potential redevelopment of the Subject Property satisfies principles of the public interest as articulated in the land use planning approvals process will be explored in detail through future approval submissions to the Town of Niagara-on-the-Lake. However, a preliminary review of public interest components of the land use planning system assists in determining whether the public interest test of the Aeronautics Act may be satisfied.

The Glendale District Plan, adopted by the Regional Municipality of Niagara in September 2020, outlines the land use strategy for the Subject Property and the surrounding area. The District Plan designates the southern portion of the Subject Property as Mixed Use High Density and the northern portion as Mixed Use Medium Density. The Glendale District Plan is noted to "...provide an opportunity to integrate more medium and higher density housing, purpose-built rental, and mixed-use buildings to diversify the housing options within the study area."

The Planning Act, in Section 2, defines a range of matters deemed to be of provincial interest. These include:

- (h) the orderly development of safe and healthy communities;*
- (j) the adequate provision of a full range of housing, including affordable housing;*
- (l) the protection of the financial and economic well-being of the Province and its municipalities;*
- (o) the protection of public health and safety;*
- (p) the appropriate location of growth and development;*

With regard to (h) and (j), the redevelopment concept being contemplated would result in a diversification of the land uses supported on the Subject Property to include residential dwellings at a variety of scales and commercial and employment uses in a mixed-use environment. While it is understood that details on housing typologies, forms of tenure (i.e., owned vs. rented), and costs will not be known until the development concept is advanced, increasing the housing supply in Niagara Region will provide housing and employment opportunities for the area's growing population. Further, this increase in housing supply would be accommodated through the intensification of developed lands as opposed to absorbing greenfield areas, consistent with land use planning best practices.

In considering (l), the potential redevelopment of the Subject Property would result in an increase in the property tax revenues collected by the Town of Niagara-on-the-Lake and other associated revenues, such as Cash in Lieu of Parkland contributions. The new residents that could be accommodated on the Subject Property would also be integrated in the regional economy, contributing to the broader well-being of the area.

Regarding (o) and (p), the degree to which the redevelopment of the Subject Property does not negatively impact public health and safety from an aeronautical perspective is addressed throughout this submission, including in Section 7.2 below.

The protection of the operational viability of Niagara District Airport is also a matter of public interest. The Airport provides numerous social and economic benefits to residents and businesses within the region by supporting services such as: scheduled passenger air services (prior to the COVID-19 pandemic), charter passenger and cargo services, corporate aircraft, air tour operators, general aviation commercial and industrial activities, flight training, recreational aviation, military, law enforcement, coast guard, and air ambulance operations. Accordingly, a permanent AZR exemption request may not be interpreted as being in the public interest if the current and future viability of the Airport is negatively impacted, with this consideration being further explored through Section 7.2.

Taking the preceding points together, the public interest condition of Transport Canada's AZR exemption requirements would likely be satisfied for the redevelopment of the Subject Property with residential and commercial land uses, provided that aviation safety and Airport operations are not compromised.

7.2 Condition 2 – Aviation Safety and Security

The development of the Subject Property is not anticipated to result in aviation safety concerns as a result of: interference with radar, communication, and ground-based navigation systems (Section 3); bird hazards (Section 4); aircraft noise (Section 5); or restrictions to visibility (Section 6). While further assessment will be required for each of these factors as development plans are advanced, concerns have not been identified that are likely to impede the AZR exemption process. Accordingly, the condition of aviation safety is expected to centre around two dimensions:

1. Does the redevelopment of the Subject Property affect the Airport's Instrument Flight Procedures and IFR traffic; and
2. Does the redevelopment of the Subject Property constitute an obstacle for aircraft operating VFR in the vicinity of the Airport, including during arrival, departure, and within the traffic circuits.

With respect to impacts to Instrument Flight Procedures, this factor can only be evaluated by NAV CANADA through the Land Use Submission process. The recommended timing for such a submission is identified in Section 8.

7.2.1 Airport Zoning Regulations and TP312

TP312 is Transport Canada's regulatory basis for certifying airports and for ensuring that a minimum level of safety is provided. All certified airports are required to meet the standards of TP312, including obstacle limitation requirements. The St. Catharines Airport Zoning Regulations are a legal instrument to ensure that the airspace around the Airport is maintained free of obstacles to protect for safe aircraft operations, and in doing so thereby ensuring that the Airport's TP312 OLS are maintained. AZRs are a tool to implement the TP312 OLS, but in doing so can sacrifice some of the specificity that underlies the standards of TP312 – in the case of the Subject Property, this is exemplified by the use of legal property descriptions for the Outer Surface as opposed to the 4,000 m radius defined in TP312, creating a larger regulated area than would otherwise be required per TP312. The AZRs are informed by TP312 and the obstacle limitation requirements of the given airport. Where discrepancies between the AZRs and TP312 OLS exist, it is the opinion of the Project Team that TP312 should prevail as it represents Transport Canada's most current requirements for aviation safety at certified airports across the country, regardless of whether each airport has AZRs.

As noted previously, the OLS of Niagara District Airport are certified according to TP312 4th Edition. Per Section 4.2.1.1 of TP312 4th Edition, an Outer Surface is to be established when it is required for the protection of aircraft conducting a circling procedure or manoeuvring in the vicinity of an aerodrome. Section 4.2.2.7 recommends that:

[Penetrations] should not be permitted above the Outer Surface except when, in the opinion of the certifying authority, the object would be shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aircraft.

TP312 5th Edition came into force and effect in 2015, replacing TP312 4th Edition and thereby representing Transport Canada's most current standards for airport certification. TP312 5th Edition defines four types of OLS: Inner Transitional, Transitional, Take-off, and Approach Surfaces. The TP312 4th Edition Outer OLS is replaced by an Outer Obstacle Identification Surface (Outer OIS); objects infringing on the Outer OIS are to be inventoried and reported to NAV CANADA and Transport Canada for detailed review but are not banned outright. Therefore, the direction of TP312 5th Edition is not that objects be prohibited from penetrating the Outer OIS at certified airports, but instead that they be identified and assessed by NAV CANADA and Transport Canada to ensure that aviation safety is not compromised.

The treatment of the Outer OLS in TP312 4th Edition and Outer OIS in TP312 5th Edition together highlight that penetrations to either surface may be considered when aviation safety risks are shown to be minor and / or mitigable.

7.2.2 Obstacle Clearances

The Canadian Aviation Regulations (CARs) are the applicable regulatory standards for aircraft operations. CAR 602.14(2) presents the minimum horizontal and vertical distances that pilots must maintain from obstacles:

Except where conducting a take-off, approach or landing or where permitted under section 602.15, no person shall operate an aircraft

- (a) over a built-up area or over an open-air assembly of persons unless the aircraft is operated at an altitude from which, in the event of an emergency necessitating an immediate landing, it would be possible to land the aircraft without creating a hazard to persons or property on the surface, and, in any case, at an altitude that is not lower than
 - i. for aeroplanes, 1,000 feet [305 m] above the highest obstacle located within a horizontal distance of 2,000 feet [610 m] from the aeroplane...**
- (b) in circumstances other than those referred to in paragraph (a), at a distance less than 500 feet from any person, vessel, vehicle, or structure.*

As described in Section 2.3.1, a representative aircraft operating in the illustrative traffic circuits of Runways 24, 01, and 19 would be further than 610 m horizontally from the Subject Property, with a minimum distance of 1,475 m provided for the closest of the three traffic circuits (Runway 24 left-hand downwind). This satisfies CAR 602.14(2)(a)(i), which is intended to provide additional levels of safety near built-up areas (i.e., a minimum vertical clearance of 1,000 ft. vs. 500 ft.). Accordingly, the redevelopment of the Subject Property is not anticipated to result in safety concerns for aircraft operating in the Airport's traffic circuits.

As described in Section 2.3.2, the proximity of the Subject Property to the illustrative Runway 19 straight-out departure and Runway 01 straight-in arrival paths must also be considered. An aircraft following the extended Runway 01-19 centreline while arriving or departing would pass abeam the Subject Property at a distance of 680 m horizontally. Allowing for a divergence of 5° from the centreline to account for variability in operations, an aircraft would pass within 377 m horizontally, and an aircraft following a centreline divergence of between 10° and 15° would overfly the Subject Property. Runway 01-19 is a daytime use runway with no Instrument Approach Procedures – VFR arrivals on Runway 01 can only occur in Visual Meteorological Conditions with a minimum visibility of 3 Statute Miles. As pilots are responsible for obstacle identification and avoidance, the presence of structures on the Subject Property would reasonably be expected to be observed by pilots scanning the approach path. The installation of lighting and / or markings, the requirement for which will be identified by Transport Canada through the Aeronautical Assessment Form process, will further improve the visibility of future structures on the Subject Property.

Based on the foregoing, aircraft arriving and departing from Runway 01-19 represent the most direct factor to be assessed from an aviation safety perspective. While the Airport's TP312 Approach OLS terminates to the northwest of the Subject Property, extending this surface along its extended centreline to a point abeam the Subject Property may represent a suitable method for determining an appropriate height limit. The TP312 Runway 01 Approach OLS when hypothetically extended beyond its regulatory dimensions to the midpoint of the Subject Property would limit penetrations exceeding 269 m ASL (882 ft. ASL), or 148 m AGL (485 ft. AGL). This may represent an appropriate maximum developable height for the Subject Property, with the understanding that shorter proposals will further increase the margin of safety available to overflying aircraft.

7.3 Conclusions

Taking these factors together, it is the preliminary opinion of the Project Team that:

1. At a minimum, a permanent exemption to the AZRs should be supportable by the Niagara District Airport Commission, NAV CANADA, and Transport Canada for the southern portion of the Subject Property not affected by the TP312 Outer OLS; and
2. A site wide AZR exemption allowing permanent development up to 271 m ASL (889 ft. ASL) or 150 m AGL (492 ft. AGL) across the entire Subject Property may be defensible and possibly supportable by the three aforementioned parties. A reduced exemption (i.e., a shorter building) would further strengthen the aviation safety case by providing additional vertical separation.

The conclusions above do not consider impacts to Instrument Flight Procedures, which must be analyzed by NAV CANADA separately, and the position of the Township of Niagara-on-the-Lake as the land use authority.

8 RECOMMENDED NEXT STEPS

This submission has been prepared for the information of LANDx and White Oaks Resort & Spa. If the decision is made to pursue a permanent exemption to the AZRs, the following next steps are recommended for consideration:

1. The Project Team will convene pre-consultation meetings with NAV CANADA, Transport Canada, and the Niagara District Airport Commission to discuss the preliminary direction being considered with respect to the redevelopment of the Subject Property and to gauge the degree to which an AZR exemption may be acceptable to each party.
2. Based on the findings of the pre-consultation meetings with NAV CANADA, Transport Canada, and the Niagara District Airport Commission, the Project Team will update the analysis contained herein and prepare a public interest and aviation safety letter for submission to the noted parties.

At this point, the AZR exemption process described by Transport Canada in SI REG-010 – Processing Exemptions from Airport Zoning Regulations would commence:

3. A NAV CANADA Land Use Submission would be prepared and provided to the organization to assess impacts to the air navigation system, including Instrument Flight Procedures. If acceptable, a letter of no objection will be provided.
4. The public interest and aviation safety letter identified in Step 2 would be submitted to the Niagara District Airport Commission. If the proposal is acceptable, a letter of no objection will be requested.
5. LANDx and White Oaks Resort & Spa are required to obtain a letter of no objection from the Town of Niagara-on-the-Lake, as the applicable land use authority. It is recognized that such a letter may not be possible until all applicable municipal planning approvals are received (e.g., Zoning By-law Amendment, Site Plan Control).
6. An AZR exemption package, including the above-noted letters of no objection, public interest and aviation safety letter, cover letter, Aeronautical Assessment Form, and application fee, would be submitted to Transport Canada for consideration.

Following the submission of the materials identified in Step 6, Transport Canada will prepare a risk assessment paper and strategic environmental assessment. If the proposal is acceptable, the exemption document will be prepared and released to the applicant.



#209-532 Montreal Road
Ottawa, ON K1K 4R4
hmaero.ca