

# Glendale Aeronautical Impacts and Proposed Development Restrictions



**SUBJECT**            **Glendale Aeronautical Impacts and Proposed Development Restrictions  
CYSN Niagara District Airport**

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## 1. INTRODUCTION

In May 2023, Avia NG was retained by the Niagara Region to provide advisory services regarding aeronautical restrictions applicable to the Glendale Secondary Plan Area in the Town of Niagara-on-the-Lake. The purpose of this assignment was to identify restrictions, predominantly those established through the St. Catharines' Airport Zoning Regulations – CYSN (Niagara District Airport), that control heights and impose use restrictions at the Glendale Secondary Plan area.

This technical memorandum is comprised of multiple sections:

1. **Introduction:** documents the purpose of this assessment;
2. **Background Information:** provides information about the Glendale Secondary Plan Area, Niagara District Airport and the Airport Zoning Regulations that are pertinent to this assignment;
3. **Findings:** details the aeronautical restrictions found to be applicable to the Glendale Secondary Plan area;
4. **Recommendations and Next steps:** provides a set of recommended action items to ensure the aeronautical restrictions are complied with as development of the area progresses;
5. **Assumptions:** documents any assumptions made during the analysis; and
6. **Conclusion:** summarizes the findings of this study.

## 2. BACKGROUND INFORMATION

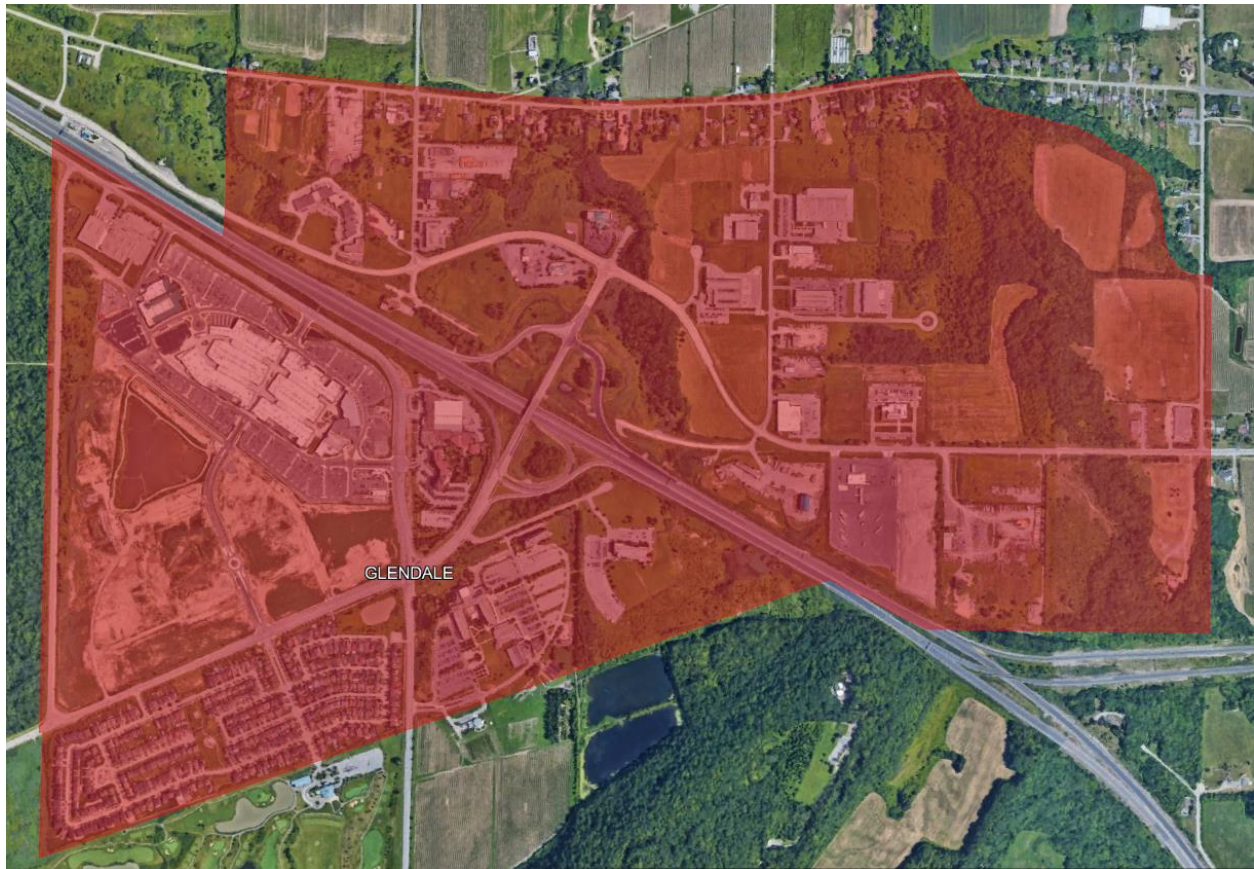
### 2.1 GLENDALE SECONDARY PLAN AREA

The Glendale Secondary Plan is located in the Town of Niagara-on-the-Lake and is found about 1.5 kilometres east of the City of St. Catharines centered on Queen Elizabeth Way / Highway 403. It is bounded by Queenston Road to the north, Homer Road to the west, the Niagara Escarpment to the south and Concession 7 Road to the east. Major features within the Glendale Secondary Plan Area include the Outlet Collection at Niagara found immediately south of Highway 403, Niagara College's Niagara-on-the-Lake Campus and a cluster of hospitality and service locations by Highway 403. A diagram showing the location of the Glendale Secondary Plan Area relative to the Niagara Region is shown in **Figure 1**, while the area and immediate surroundings is shown in **Figure 2**.

The boundaries of Niagara-on-the-Lake Comprehensive Zoning By-law 4316-09 generally follow the boundaries of the Glendale Secondary Plan Area. West of Highway 403 and Taylor Road, the area is zoned primarily for various residential land uses with open Space and commercial pockets. East of Taylor Road is zoned for a mix of commercial, institutional and industrial uses. North of Highway 403 and west of Townline Road is a mix of residential, commercial, open space and industrial uses, while east of Townline Road is designated predominantly industrial with open space and one residential pocket. Maximum permitted heights range from 10 m – 18 m for the residential designations, 12 m – 15 m for commercial, 10 m – 12 m for industrial, and 4 m for institutional designations. The Glendale Secondary Plan Area is similar to, but slightly smaller than, the Glendale District Plan Area.



**Figure 1 – Context Map Showing Niagara Region, Airport and Glendale Secondary Plan Area**



**Figure 2 - Context Map Showing Glendale Secondary Plan Area**

## **2.2 NIAGARA DISTRICT AIRPORT (CYSN)**

The Niagara District Airport (CYSN) is a municipal airport in the Town of Niagara-on-the-Lake. It is located approximately 2.3 km east of the edge of St. Catharines and 4.1 km north of the Glendale Secondary Plan Area. **Figure 1** provides a context map showing key locations in the Airport's vicinity.

Niagara District Airport is a general aviation airport operated by the Niagara District Airport Commission comprised of representatives from St. Catharines, the City of Niagara Falls and the Town of Niagara-on-the-Lake. The Airport has three bidirectional runways: Runways 01-19, 06-24, and 11-29. Niagara District Airport's aerodrome elevation is reported to be 322 feet (98.14 m) above sea level (ASL). The Niagara District Airport maintains Airport Zoning Regulations, the characteristics of which are described in section 2.3.

Niagara District Airport has also established an Aerodrome Reference Point (ARP). The Aerodrome Reference Point, sometimes referred to as the Airport Reference Point, guides the development of Aeronautical Zoning Regulations and is typically a designated point near the geometric centre of the runway complex that establishes the locus of the radius of the outer surface. The ARP has been established at 95.0m (312') ASL in the CYSN Airport Operations Manual.

### **2.3 AIRPORT ZONING REGULATIONS**

Airport Zoning Regulations (AZRs) are federal regulations enabled by the Canadian Aeronautics Act that certain airports have established to restrict land uses and the heights of structures, objects and vegetation on lands that the AZR applies to. AZRs are enacted to protect aircraft and airport operations, and to ensure the longevity of an airport as the built environment and airport surroundings grow and evolve. AZR height restrictions are imposed by three surfaces: the approach, transitional, and outer surfaces. These surfaces protect vital airspace around an airport and the AZR prohibits these surfaces from being penetrated by any object or structure at any time.

Airport Zoning Regulations for Niagara District Airport have been in place since 1984 and are enacted through the St. Catharines Airport Zoning Regulations (SOR/84-901). They are sometimes referred to as the CYSN Airport Zoning Regulations.

A portion of the Glendale Secondary Plan Area falls below the outer surface of the CYSN Airport Zoning Regulations (CYSN AZRs). The outer surface is described by the Airport Zoning Regulations as “an imaginary surface located at a common plane established at a constant elevation of 45 m above the assigned elevation of the airport reference point except where that common plane is less than 9 m above the surface of the ground, the imaginary surface is located at 9 m above the surface of the ground.” Per section 2(2) of the CYSN AZRs, the assigned elevation of the Airport Reference Point (ARP) is 95 m above sea level. As the outer surface is at a height of 45 m above the ARP, the elevation of the outer surface has been established at 140 m above sea level (ASL).

The outer surface is typically a circular surface with a radius of 4000 m centered on the centre of an ARP. However, the outer surface typically undergoes a “normalization” process at the time of AZR establishment, which modifies the boundaries of the outer surface to follow lot lines of property parcels to avoid placing height and/or land use restrictions on partial fragments of a property parcel. In this way, the outer surface for the CYSN AZRs was normalized around the land parcels within the Glendale Secondary Plan Area. As such, those entire parcels would be subject to the restrictions imposed by the CYSN AZRs.

## **FINDINGS**

The following observations, findings and consequently implications have been noted in the analysis of aeronautical restrictions applicable to the Glendale Secondary Plan Area.

### **2.4 AIRPORT ZONING REGULATIONS**

The Glendale Secondary Plan Area is found partially beneath the outer surface of the CYSN Airport Zoning Regulations. No portion of any development, construction equipment, or any other object on the lands beneath the outer surface would be permitted to project vertically above 140 m ASL<sup>1</sup>, even temporarily. The

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<sup>1</sup> Section 4(b) of the CYSN AZR states “No person shall erect or construct, on any land to which these Regulations apply, any building, structure or object or any addition to any existing building, structure or object, the highest point of which will exceed in elevation at the location of that point the outer surface.”

height restrictions imposed by the outer surface also include objects of natural growth, including trees<sup>2</sup>. Finally, the lands beneath the outer surface would not be permitted to dispose of waste in a way that may attract birds<sup>3</sup>.

## **2.5 CONSTRUCTION AND DEVELOPMENT IMPLICATIONS**

The restrictions imposed by the CYSN AZR on the Glendale Secondary Plan Area have a number of implications for any future development contemplated for those lands. These implications are grouped by AZR restriction and further described in sections 3.2.1 through 3.2.3.

### **2.5.1 OUTER SURFACE HEIGHT RESTRICTIONS**

A portion of the Glendale Secondary Plan Area is subject to a height restriction of 140 m ASL in maximum elevation. As detailed in section 3.1, the height restriction is applicable to any element on the subject lands. For a proposed development this restriction includes, but is not limited to, flagpoles; buildings; building rooftops and rooftop structures such as cooling towers, antennas, elevator overruns and elevator machine rooms; as well as construction equipment such as construction cranes, concrete pumps, material hoists, and mobile cranes used for assembly and dismantling.

A vertical clearance of at least 3.0 metres from the outer surface is strongly encouraged for any portion of the proposed development, construction equipment and any other objects on the subject lands. The 3.0-metre buffer affords a measure of safety from intruding the outer surface in the event of minor inaccuracies in ground elevations from differing elevation datums and conversion. The 3.0-metre buffer also allows for building rooftop use and regular maintenance activities – it is conceived that periodically maintenance personnel and their equipment would need to access the roof for such activities. Therefore, the maximum permitted elevation of any object on the Glendale development area lands is recommended to be limited to 137.0 m ASL.

The ground elevation contours for the Glendale Secondary Plan Area were found to range from 108.0 m to 124.0 m ASL throughout the property. With a 0.75-metre elevation datum discrepancy factor and the 3.0-metre construction and maintenance buffer applied, the maximum permitted development height for the area would range from 12.25 m to 20.25 m above ground elevation, based on existing topography. Should grading change through this area to reduce grade elevations, the same maximum elevation of 137.0 m ASL would apply.

Exhibit 1, which is included as Appendix A, depicts in greater detail the locations of the maximum permitted development heights.

### **2.5.2 NATURAL GROWTH**

Consideration should be given to any objects of natural growth, or vegetation, found in the Glendale Secondary Plan Area. Height restrictions imposed by the outer surface of the CYSN AZRs would be

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<sup>2</sup> Section 5 of the CYSN AZR states “Where an object of natural growth on any land to which these Regulations apply exceeds in elevation any of the surfaces referred to in paragraphs 4(a), (b) and (c), the Minister may make a direction that the owner or occupier of the land on which that object is growing remove the excessive growth.”

<sup>3</sup> Section 6 of the CYSN AZR states “No owner or occupier of any land to which these Regulations apply shall permit that land or any part of it to be used for the disposal of any waste that is edible by or attractive to birds.”

particularly important for contemplated green roofs where vegetation would be projecting vertically from a rooftop. Careful monitoring and maintenance would be required to ensure vegetation is not permitted to grow to an elevation where it would penetrate the outer surface.

### 2.5.3 WASTE DISPOSAL

Care and consideration must be given to waste disposal methods for developments in the Glendale Secondary Plan Area falling beneath the outer surface, such that waste does not become a bird attractant. Standard waste management techniques may be utilized to achieve such an effect.

## 2.6 AIRCRAFT NOISE

The western portion of the Glendale Secondary Plan Area is located beneath the outer surface of the CYSN AZRs but is also in line with the approach to Runway 01 as it falls just outside of the CYSN AZR-established approach surface for the runway. As such, the lands may be subject to some level of aircraft noise from longer aircraft approaches to Runway 01, as well as aircraft circling in the vicinity of the airport to other runways. Aircraft noise studies are recommended for sensitive land uses – predominantly residential housing that is contemplated for lands near airports. A noise study for the Glendale Secondary Plan Area would ensure that noise levels from aircraft using Niagara District Airport are within the recommended values set by Transport Canada to reduce the level of local annoyance from aircraft noise. If the level of aircraft noise is above a certain recommended threshold, noise attenuation measures and further acoustic studies and mitigations may be required before any proposed developments are able to occur.

## 2.7 NOTAM PUBLISHING REQUIREMENTS

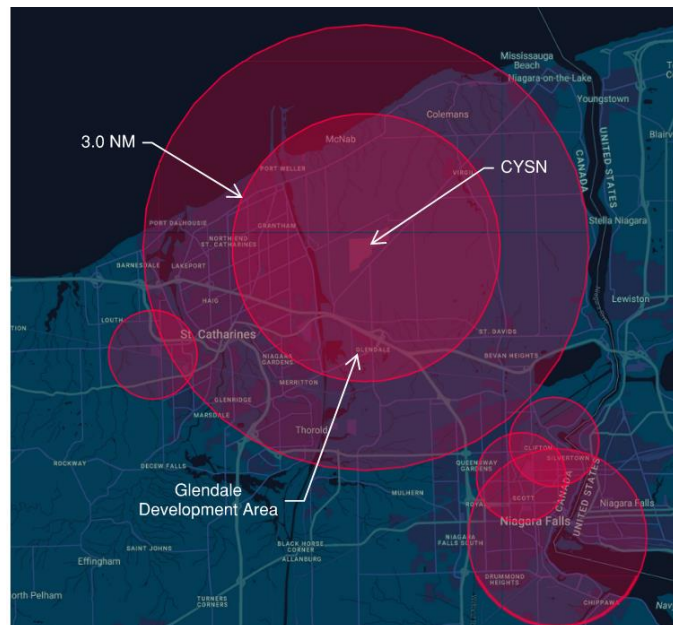
Notices to Air Missions (NOTAMs) are notices distributed to and available for aeronautical operations personnel, related to conditions, changes or developments that may impact aircraft operations. NOTAM submission would be required for construction on the Glendale Secondary Plan Area in the event that construction cranes are used, due to the area's proximity to the Niagara District Airport and vertical proximity to the CYSN AZR outer surface. NOTAM publication and amendments are NAV CANADA's responsibility; as such, NOTAMs may be submitted by contacting the nearest Flight Information Centre (FIC) – London FIC for the Niagara Region – or through submitting a form online through the NAV CANADA website. [Land Use Submission Forms](#) typically inform NAV CANADA of building developments, and temporary crane use, and all developments in the vicinity of the Airport should be directed to NAV CANADA's website to submit appropriate notifications.

## 2.8 RPAS RESTRICTIONS

Given the Glendale Secondary Plan Area's proximity to the Niagara District Airport, a brief review of Remotely Piloted Aircraft System (RPAS), or drone, restrictions was undertaken as part of this assessment.

According to the Canadian Aviation Regulations, drones cannot be flown within 3.0 nautical miles (5.6 km) from the centre of any airport and 1.0 nautical mile (1.9 km) from any heliport. The entirety of the Glendale Secondary Plan Area is located within 3.0 nautical miles of the Niagara District Airport and therefore flying drones is not permitted on the Glendale Secondary Plan Area lands unless permission is obtained from NAV CANADA in the form of a Special Flight Operations Certificate (SFOC).

**Figure 5** illustrates the location of the Glendale Secondary Plan Area relative to the RPAS restrictions in place for Niagara District Airport. The darker orange circles illustrate the 3.0-nautical-mile radius from the Niagara District Airport and the 1.0-nautical-mile radius from nearby heliports.



**Figure 5 – Glendale Secondary Plan Area Location Relative to CYSN RPAS Restriction Areas  
(Source: Transport Canada Drone Site Selection Tool)**

### **3. RECOMMENDATIONS AND NEXT STEPS**

It is recommended that the restrictions detailed in this report are acknowledged by the municipal and/or regional planning departments in the creation of plans for the Glendale Secondary Plan Area. For example, development height and land use restrictions as described in section 3 may be incorporated into planning documents such as the future revised Glendale Secondary Plan or an update to the Glendale District Plan.

Niagara Region may choose to prepare a development guide for developers operating within lands restricted by the CYSN AZR outer surface to provide a briefing related to aeronautical restrictions on lands contemplated for development. It is recommended that planning approval bodies, such as the Niagara Region and Town of Niagara-on-the-Lake planning departments, are informed of these aeronautical restrictions such that development proposal approvals can be issued with consideration to these restrictions. Other areas closer to the Airport may be subject to additional height limitations imposed by the approach and transitional surfaces. As such, aeronautical impact assessments should be conducted for each new development in the Niagara District prior to being accepted as complete applications.

Prior to the development of Glendale Secondary Plan Area lands falling below the outer surface, the Niagara District Airport's ARP and AZR surfaces must be surveyed by an Ontario Land Surveyor for significantly greater certainty that proposed development elevations do not impact the CYSN AZR surfaces, thus ensuring the integrity of Niagara District Airport's airspace protections and the longer-term viability of the AZRs and consistent use of the Airport. This study may be conducted as part of an aeronautical impact assessment to ensure that proposed developments are evaluated correctly by a qualified aeronautical consultant.

Finally, as mentioned in section 3.3, aircraft noise and acoustics studies are recommended prior to any development to ensure that the location of the Glendale Secondary Plan Area does not result in excessive

levels of annoyance due to aircraft noise associated with aircraft operations on approach to Runway 01 or circling the airport.

#### 4. ASSUMPTIONS

During this assessment of aeronautical restrictions and interpretation of height restrictions, a few assumptions were made and documented below:

1. The ground elevations for the Glendale Secondary Plan Area were obtained from the Niagara Peninsula Conservation Authority, collected during the 2020 South Western Ontario Orthophotography Project (SWOOP). The dataset provided 1-metre contours referenced vertically to the CGVD2013 elevation datum and horizontally to the NAD83 (CSRS) UTM Zone 17N coordinate system. Because these contours were provided in 1-metre increments, conservative approaches were used in the development of aeronautical restrictions to account for rounding errors and uncertainty in precise ground elevations.
2. The CYSN AZRs did not contain elevation vertical datum information. As such, conservative measures were introduced into the assessment to account for differences between the CGVD2013 vertical datum used for ground elevations and the unknown vertical datum used for the AZR surfaces.

The assumptions noted in this section would be rectified and addressed through the Recommendations and Next Steps identified in section 4, through the use of surveying techniques and more detailed assessments once future development of the Glendale Secondary Plan Area has begun.

#### 5. CONCLUSION

The Glendale Aeronautical Impacts and Proposed Development Restrictions assignment has analyzed the St. Catharines Airport Zoning Regulations associated with Niagara District Airport to provide the aeronautical restrictions applicable to the Glendale Secondary Plan Area. Further considerations regarding aircraft noise, NOTAM requirements and RPAS restrictions have also been provided. Compliance with the AZR intends that future developments in the Glendale Secondary Plan Area will be compatible with the Niagara District Airport's existing operations.

Should you have any questions or comments, please do not hesitate to contact the undersigned.

Sincerely,



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Avia NG – Aviation Planning and Advisory



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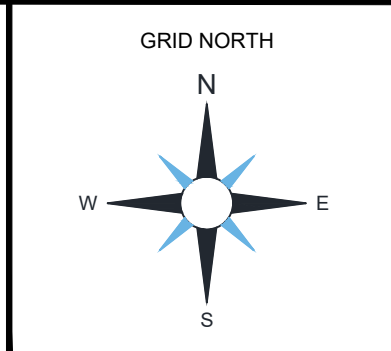
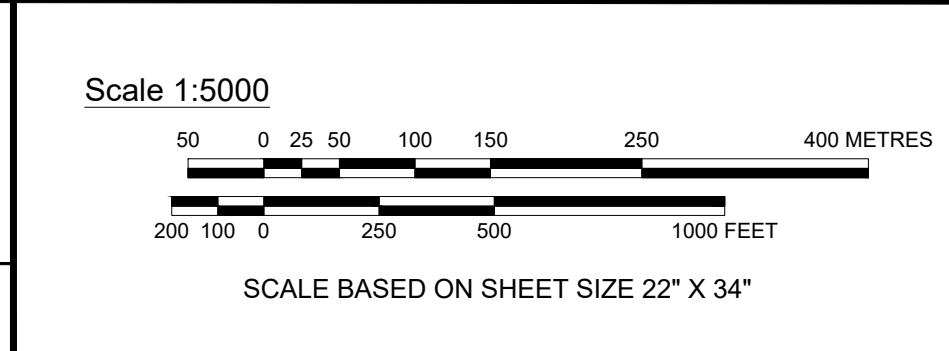




**Notes**

1. TO BE USED FOR PLANNING PURPOSES ONLY.
2. TOPOGRAPHY BASED ON 2020 SOUTH WESTERN ONTARIO ORTHOPHOTOGRAPHY PROJECT (SNOOP).
3. ALL ELEVATIONS REFERENCED VERTICALLY TO CGVD 2013 ELEVATION DATUM, AND HORIZONTALLY TO NAD 83 (CSRS) UTM Z17N COORDINATE SYSTEM.
4. AZR LINENWORK DATA PROVIDED BY THE NIAGARA DISTRICT AIRPORT. ELEVATIONS, AND HEIGHTS ARE APPROXIMATE. NO REFERENCE DATUM WAS SPECIFIED FOR CYSN AZR.

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Client: REGIONAL MUNICIPALITY OF NIAGARA

Project: **GLENDALE AERONAUTICAL IMPACTS AND PROPOSED DEVELOPMENT RESTRICTIONS**

Title: <b>GLENDALE SITE AZR DEVELOPMENT RESTRICTIONS</b>	
Revision: 1	Date: AUGUST 11, 2023
QA/QC: DF	Avia NG Project No. 23-0073-00
Drawn: NG	Exhibit: 1

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