Université Concordia University

ENVIRONMENTAL
HEALTH AND SAFETY

UAV/DRONE GUIDELINES

NOVEMBER 2017

718-43844

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Contents

Executive Summary

The legislation covering unmanned flight operations is layered and complex. This document is designed to pull back the layers to identify what regulatory restrictions apply based on the reader's personal circumstance. This summary will give the reader the key requirements but the details of where these emerge are found in the text that follows. In all cases, every drone brought to Concordia University must be registered with the EHS department.

Concordia University has two campuses, and they are both classified "No Drone Zones". The 'No Drone Zone' designation will prohibit all recreational drone flights (i.e. flights for fun) at both campuses. The implication of this decision is that all flights at these campuses can only take place after acquiring permission from Concordia University and obtaining the Special Flight Operations Certificate (SFOC) where appropriate.

On our campuses, non-recreational outdoor flights (i.e. flights for a purpose) are not possible under the Exemption Conditions provided by the regulations. Both sets of Exemption Conditions that would normally allow this type of flight cannot be adhered to at either of the University campuses, irrespective of the size of the drone. These flights may only be possible provided the operator applies for Permission to Fly from Concordia University, has the appropriate liability insurance, has appropriate flight and airspace knowledge, details a plan to secure the flight area, and successfully acquires the SFOC from Transport Canada.

Indoor flights are handled in-house through an Internal UAV Permit system provided there is a mechanism to keep secure and isolate the area of flight from the general public. If it is not possible in an indoor flight to isolate from the general public, then the SFOC from Transport Canada is again required. The operator must also have permission to fly from Concordia University, have the appropriate liability insurance, have appropriate flight knowledge, and detail a plan to secure the flight area.

Table 1 identifies the different conditions to be satisfied based on the purpose of the flight, location of the flight and the UAV mass. Also identified are the Concordia UAV program requirements. For greater details, see the text of this guideline.

Purpose	Location	UAV Mass	How-to-fly
Recreational	Concordia	ALL	**PROHIBITED**
Recreational	Off-Site	<250g	Regulated by CARs section 602.45 See safe flying Tips Site Selection Tool
Recreational	Off-Site	250g - 1kg	Regulated by Interim Order No.8 Not in controlled or restricted airspace; 30 m (100 feet) lateral distance; 5.5 km from aerodrome; 1.8 km from heliport; label drone; Site Selection Tool
Recreational	Off-Site	1kg - 35kg	Regulated by Interim Order No.8 Not in controlled or restricted airspace; 75 m (250 feet) lateral distance; 5.5 km from aerodrome; 1.8 km from heliport; label drone; Site Selection Tool
Recreational	Off-Site	>35kg	SFOC Required Site Selection Tool
Non-Recreational	Off-Site	<1kg	Exemption conditions 1kg and less, or SFOC Site Selection Tool
Non-Recreational	Off-Site	1kg - 25kg	Exemption Conditions >1kg to 25kg, or SFOC Site Selection Tool
Non-Recreational	Off-Site	>25kg	SFOC Required Site Selection Tool
Non-Recreational	Concordia Indoor	<1kg	Internal UAV Permit
Non-Recreational	Concordia Indoor	1kg - 25kg	Internal UAV Permit
Non-Recreational	Concordia Indoor	>25kg	Internal UAV Permit
Non-Recreational	Concordia Outdoor	<1kg	UAV Registration; Permission to Fly; Liability Insurance; SFOC required
Non-Recreational	Concordia Outdoor	1kg - 25kg	UAV Registration; Permission to Fly; Liability Insurance; SFOC required
Non-Recreational	Concordia Outdoor	>25kg	UAV Registration; Permission to Fly; Liability Insurance; SFOC required

Table 1. Organisation of UAV flight requirements sorted by purpose and location, followed by UAV mass.

Definitions and Acronyms

AAE – Above Aerodrome Elevation

AC – Advisory Circular - An Advisory Circular (AC) provides information and guidance with regard to a specific issue or regulation.

Aerodrome – Colloquially, an Airport that may provide service to airplanes on land or water, and/or to helicopters. If it is a water aerodrome, it provides services to water landing planes. A heliport provides service exclusively to helicopters.

AGL – Above Ground Level

ATC – Air Traffic Control

Built Up Area – This currently means areas with groups of buildings or dwellings (two or more) including anything from small hamlets to major cities. Anything larger than a farmstead is considered a built-up area.

BVLOS – Beyond Visual Line of Sight. This is the instance where the UAV may be operated beyond the visual line of sight of the operator. In such instances, a distant visual observer with communications tools may be employed to relay information. This type of flight is discouraged as it leads to greatly increased risk.

CARs – Civil Aviation Regulations

Control Zone – Controlled airspace of defined dimensions extending upwards from the surface of the earth to 3000' above aerodrome elevation (AAE) rounded to the nearest 100 feet, unless otherwise specified.

Controlled Airspace – Airspace of defined dimensions within which Air Traffic Control service is provided.

CYUL – see YUL.

DAH – Designated Airspace Handbook. A handbook updated and published every 57 days by Canada's Ministry of Transport, detailing classification of different portions of Canadian airspace, incorporating civil aeronautical data from NAV Canada and military aeronautical data from the Canadian Department of Defence.

Drone – Unmanned vehicle that is operated from a distance whether for recreational, research or work use. In the present context, these are UAV, UAS, or Model Aircraft.

FOI – Foreign Object Ingestion – the event whereby a foreign object enters a plane engine or turbine.

FPV – First Person View, using UAV mounted cameras or onboard sensors in conjunction with goggles or monitors to fly a UAV without visual line of sight.

Heliport – See Aerodrome.

Model Aircraft – An aircraft, including an unmanned aircraft commonly known as a drone, with total weight less than 35 kg that is mechanically driven or launched into flight for recreational purposes and that is not designed to carry persons (or other living creatures); may be fixed wing and designed as a model of something that exists as a full sized manned vehicle.

Non-Recreational – Flying for any purpose other than the 'enjoyment of flying'. These include flying for the purpose of photography, videography, preparing for student competition, testing UAV, testing programming or controls, flying for research where UAV are secondary to the research, flying for research on UAV systems, flying for work, inspections or commercial purposes, or in association with academic purpose.

NOTAM – Notice to Air Men.

Recreational – This is flying for the 'enjoyment of flying'.

SFOC – Special Flight Operations Certificate, a document issued by the Civil Aviation Regional Office permitting flights to take place in controlled airspace. This SFOC details the limitations of the flight operations authorized.

UAS – Unmanned Air (Aerial) System – Consists of the UAV, the ground-based controller, and the system of communications used to command the UAV.

UAV – an Unmanned Air (Aerial) Vehicle that is a power-driven aircraft, other than a model aircraft, that is designed to fly without a human operator on board.

VLOS – Visual Line of Sight, using unaided visual contact with an aircraft to maintain control of the aircraft, know its location, and be able to scan the airspace in which it is operating to sense and avoid other aircraft or objects. There is usually a requirement that the UAV be operated by visual line of sight rather than through a 'first person view' or visual observer relaying information.

Water Aerodrome – see Aerodrome.

YUL – Montreal airport known as Pierre Elliot Trudeau International Airport/Aeroport International Pierre Elliot Trudeau. Also referred to as CYUL.

Preamble on Clear Terminology

The term 'drone' colloquially referred to military use of unmanned air vehicles. These were larger, capable of carrying a payload, flew long range and resembled fixed wing planes most often. The terms 'model aircraft', 'UAV', 'UAS' and 'drone' are often used interchangeably and all these terms refer to the same type of object, an unmanned air (aerial) vehicle. In this document, as a catchall term, we will use 'drone'. This will be the clearest approach as the terms 'model aircraft' and 'UAV' will connote specific requirements in Canadian Legislation.

!	Helpful Hint
	When in doubt, use the term '**drone**'. UAV and Model Aircraft are specific terms used in Canadian regulations and may carry regulatory implications.

'Model aircraft' is historically the term used for recreational drones flown by hobbyists. These tended to resemble real world planes and helicopters. Currently, on the consumer market, these most often resemble vertical lift multi-copter aircraft (e.g. quad-rotor, hex-rotor), of various sizes.

'Unmanned Air Vehicle' (UAV) is a term used in the regulations to identify those drones that are not considered 'model aircraft'. In general, the terms UAV and drone are used interchangeably. On occasion, the terms model aircraft and UAS (unmanned air system) find their way into use as well. If reading other sources, it is important to understand what the writer intends when they use a particular term. In this document we will use the terms appropriate for Canadian legislation.

Introduction

Drones are becoming increasingly less expensive and more attainable for new hobbyists. The easy to use controllers and flight assisting or stabilizing software on many drones render them 'easy to fly', requiring less skill or training to operate. Many drones are sold as 'ready to fly', some requiring minimal assembly or preparation out of the box. This has led to a marked increase in drone use in the recreational and commercial domain.

Based on some Transport Canada estimates, the number of UAV (UAS units) in Canada has been estimated to be approximately 337 468 units by the end of 2017. The total number of UAV (UAS units) is estimated to reach about 575 600 by the end of 2018.[i]

Flying UAV in Canadian airspace must meet certain safety and regulatory conditions. These are just a few examples that illustrate why Transport Canada is trying to control this pastime.

On September 13, 2016, an unidentified drone was discovered near a principal landing strip at YUL. No one knew how it arrived there, or under what circumstances. The discovery was not made public immediately and to date, the owner has not come forward or been identified.[ii]

On December 21st, 2016 a man reported being narrowly missed by a drone crashing near him on a downtown street near Old Montreal.[iii] Again, the owner or operator was not identifiable.

On April 19, 2017, a pilot of a 50 seat DASH-8 flying for Air Canada Jazz reportedly had a drone fly so close at an altitude of 4000 feet, on approach to YUL, that he was able to identify the model of the drone, a DJI Phantom.[iv]

Foreign object ingestion (FOI) is a serious concern for air breathing propulsion systems[v] and can adversely affect planes in flight. Based on FOI of birds or bird collision studies with large aircraft and the difference in hardness of the UAV in comparison to birds, there is a general concern that a collision with UAV can cause serious damage to a plane in flight. The FAA has begun some studies to determine the risk to aircraft from head on UAV collisions and UAV ingestion into engines[vi].

Studies related to FOI and head-on collision studies like these will inform and lead to changes in design standards for the aviation industry. Incidents like those reported and results of collision studies with UAV have led to changes in the regulations, with most regulators getting notably stricter, and more targeted to restricting recreational drone use.

Legislation

Canada's federal government has jurisdiction over aviation and aeronautics. In 2010, the Supreme Court of Canada reiterated that aeronautics was in the exclusive jurisdiction of the federal government when a municipal by-law attempting to re-zone and thereby restrict an existing water aerodrome was deemed to be in direct conflict with the federal jurisdiction.[vii]

Through the Aeronautics Act[viii], two different ministers are implicated in regulating and maintaining the safety of Canadian airspace. Where any of the following are involved, the Minister of National Defence is the minister responsible:

- national defence,
- military personnel,
- a military aeronautical product,
- a military aerodrome or military equipment of Canada or a foreign state,
- a military facility of Canada or a foreign state relating to aeronautics,
- and a service relating to aeronautics provided by such personnel, product, aerodrome, equipment or facility.

All other matters, being civilian in nature, refer to the Minister of Transport as the minister responsible.

The main legislation that regulates aviation is the Aeronautics Act and its associated regulations, the Canadian Aviation Regulations (CARs). The Canadian Aviation Regulations address items that may be launched, flown, floated or controlled in Canadian airspace. It is here, in sub-sections 602.41 and 602.45 that the regulation of UAV and Model Aircraft also falls within the scope of Transport Canada.

> **Subpart 2 — Operating and Flight Rules**
> **Division I — General**
> […]
> **Unmanned Air Vehicles**
> **602.41** No person shall operate an unmanned air vehicle in flight except in accordance with a special flight operations certificate or an air operator certificate.
> ***SOR/2003-271, s. 6.***
> […]
> **Model Aircraft, Kites and Model Rockets**
> **602.45** No person shall fly a model aircraft or a kite or launch a model rocket or a rocket of a type used in a fireworks display into cloud or in a manner that is or is likely to be hazardous to aviation safety.

!	Offence	Personal Fine	Corporate Fine
	Violation of section 602.41 of the CARs	$5,000	$25,000

Violation of section 602.41 may carry a fine of up to $5,000 for an individual or up to $25,000 for a corporation. This is in application of a person or corporation that executes a flight operation without first obtaining a special flight operations certificate (SFOC).

A later part of the regulation regarding the Special Flight Operations Certificate indicates:

> **Division IV — Miscellaneous Special Flight Operations**
> **Application**
> **603.65** This Division applies in respect of the following flight operations when not conducted under Part VII:
> […]
> - (d) the operation of an unmanned air vehicle;
>
> […]
> **Certification Requirements**
> **603.66** No person shall conduct a flight operation referred to in section 603.65 unless the person complies with the provisions of a special flight operations certificate issued by the Minister pursuant to section 603.67.
> […]
> **Contents of Special Flight Operations Certificate**
> **603.68** A special flight operations certificate shall contain the following information:
> - (a) the name and address of the certificate holder;
> - (b) the number of the certificate;
> - (c) the date of issue of the certificate;
> - (d) the validity period of the certificate;
> - (e) the type of flight operation authorized; and
> - (f) any condition pertaining to the operation that the Minister deems necessary for aviation safety.

!	Offence	Personal Fine	Corporate Fine
	Violation of section 603.66 of the CARs	$3,000	$15,000

Violation of section 603.66 may carry a fine of up to $3,000 for an individual or up to $15,000 for a corporation. This is in application of a person or corporation that executes a flight operation outside the provisions of a special flight operations certificate (SFOC) that has been successfully obtained. This includes any of the conditions in the text of the SFOC included under 603.68(f).

!	Helpful Hint
	Once an SFOC is obtained, read the conditions of the SFOC carefully. If they cannot be complied with or differ from what was requested in your application, contact the civil aviation regional office that issued your SFOC as soon as possible to have it modified.

In addition to the Aeronautics Act, UAV operators must follow the rules in all acts and regulations—including the Criminal Code, as well as all municipal, provincial, and territorial laws regarding trespass, the Privacy Act, and in Quebec, the Civil Code.

!	Helpful Hint
	Even though Quebec is one of the only jurisdictions to not have a specific Trespass Act, you must respect the private property of others, especially where it is clearly plain that the property is privately owned. Seek permission before accessing or using private property.

Recreational Activity – CARs 602.45

Section 602.41 and 602.45 of the regulation attempts to make a distinction between the terms Model Aircraft and Unmanned Air Vehicle. Upon closer inspection of the definitions provided in the regulation, this is in fact distinguishing recreational use of a drone less than 35 kg from all other drones.

Recreational activity is deemed to be flying for the pure enjoyment of flying. All other activities are deemed to be non-recreational activities. Non-recreational activities can include flying for the purpose of obtaining photo/video, visual inspections, competitions, testing UAV, programming or controls, research, work or commerce.

!	Helpful Hint
	If you have any purpose or goal in flying, it is likely not 'recreational activity'.

Recreational use of a drone less than 35 kg is subject to section 602.45 and is considered model aircraft. Additional restrictions for recreational use of a drone have been adopted through ***Interim Order No. 8***[ix], which is a temporary regulation imposed until the parent regulation can be amended. This interim order superseded 602.45 of the CARs but applies only to drones from 250 grams to 35 kg used for recreation.

The interim order does not apply to drones below 250 grams used for recreation. In this instance, these are still considered model aircraft and section 602.45 continues to apply. Transport Canada has provided some safe flying tips on their website for recreational UAV (model aircraft) below 250 grams. The safe flying tips in this document include those found on the Transport Canada website but have some more elaboration.

Special Flight Operations Certificate – CARs 602.41

Section 602.41, as it was originally written, indicates that the SFOC is required for any non-recreational operation of a drone, regardless of the size or any other criteria. It also requires the SFOC for any recreational operation of a drone greater than 35 kg. The definitions essentially indicate that if the drone is not to be considered a model aircraft, it is to be considered a UAV. This would necessitate that the operator applies for the SFOC every time a new flight activity is to be carried out.

Transport Canada is responsible for transportation safety oversight and for issuing of transportation operating permits and certifications, including those related to aviation. The Special Flight Operations Certificate is issued from Transport Canada's Civil Aviation Regional Office from the region the flight operation originates.

There are instances where applicants having a good track record may be granted a standing SFOC covering repeated operations over a broader period of time. Since the majority of the SFOC are customarily issued for a single operation like aerial work, aerial photography, or a building inspection, a natural result of the increase in UAV use in the past few years has been a marked increase in SFOC applications. This increase in non-recreational UAV use has overwhelmed the Transport Canada UAV SFOC approval system[x] such that they have difficulty adhering to the 20 day turnaround time for SFOC applications. This is one reason Transport Canada has looked to increased self-management with this activity and continues to do so with proposed legislative changes.

!	Helpful Hint
	If you must apply for an SFOC, anticipate 8-12 weeks for review of your application. Adding a few extra weeks for preparation of required documents for your application and this means you should be planning a flight 3-4 months ahead of schedule.

In November 2014, the office of Civil Aviation Standards, under Transport Canada, issued an Advisory Circular (AC 600-004) entitled 'Guidance Material for Operating Unmanned Air Vehicle Systems under an Exemption'. An Advisory Circular (AC) provides information and guidance in regard to a specific issue in law. In this case the AC provides general guidance, safety practices and explanatory information for UAV operators to perform a flight under an exemption to Sections 602.41 and 603.66 of the *Canadian Aviation Regulations* (CARs)[xi]. This AC gave specific circumstances for the exemptions that would permit a UAV flight operation without necessitating obtaining a SFOC. Originally, the UAV mass ranges for the exemptions were (A) below 2 kg and (B) from 2 kg to 25 kg. The AC was updated most recently in December 2016, and the mass ranges have been adjusted to (A) 1 kg and less and (B) greater than 1 kg up to 25 kg.

Non-Recreational Activity

All non-recreational uses of a drone (or model aircraft), or any drone greater than 35 kg are all considered UAV by definition and are subject to section 602.41 and 603.66. Inasmuch as recreational flight operations have been made more restrictive with the Interim Order No.8, non-recreational UAV flight operations have become less restrictive with two sets of ***Exemption Conditions*** having been adopted through AC 600-004.

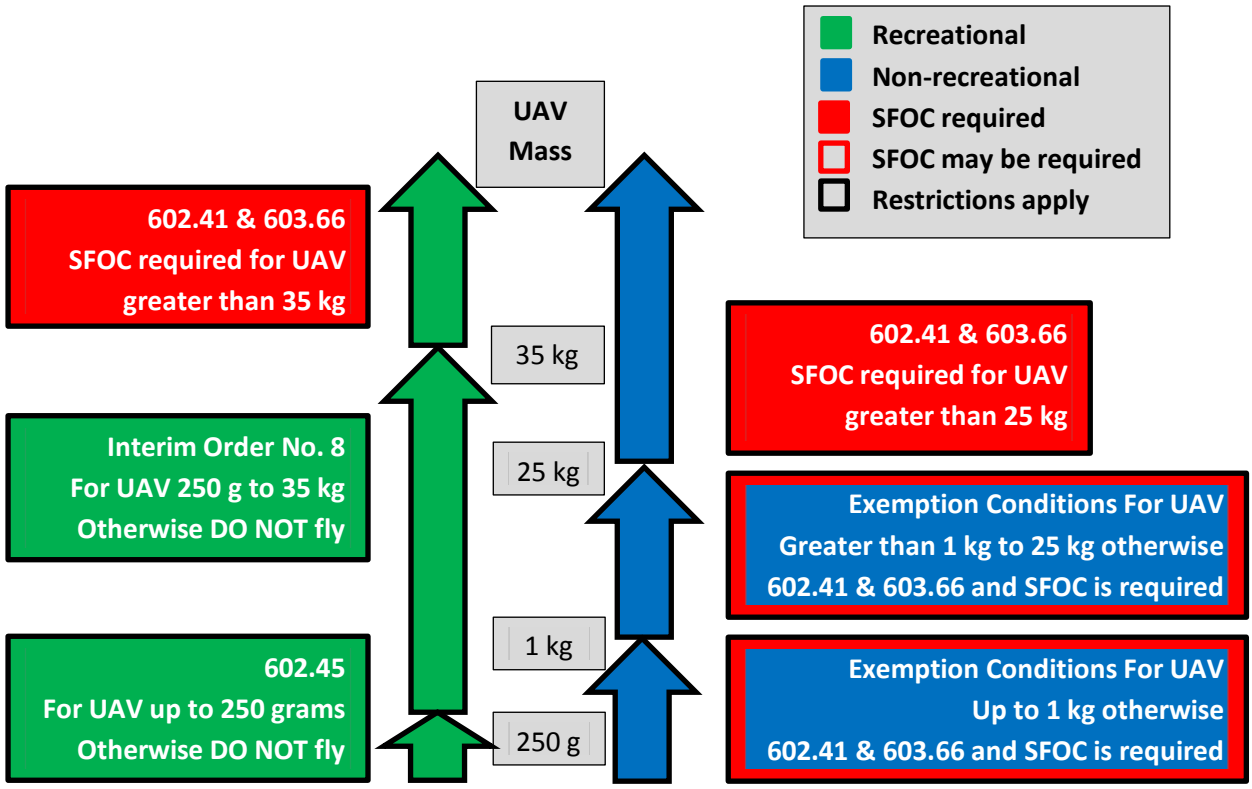


Figure 1. Diagram showing different regimes under which a flight operation may be conducted.

There exist 43 exemption conditions for UAV up to 1 kg[xii]. In addition, there are 61 exemption conditions for UAV greater than 1 kg and up to 25 kg[xiii]. These exemption conditions allow certain non-recreational flight operations involving UAV to take place without the SFOC required by the regulation, provided all exemption conditions can be satisfied. If the exemption conditions cannot be met, the SFOC must be obtained. This means that although 602.41 indicates the SFOC is required for all non-recreational flights of UAV, this is in fact not the current requirement by virtue of the exemption conditions.

However, all non-recreational flights of drones greater than 25 kg as well as recreational flights of drones greater than 35 kg will require the SFOC from Transport Canada. Figure 1 illustrates the different regulatory sections, interim order or exemption conditions under which a flight operation may be conducted.

Conditions of Interim Order No. 8

Users of this guideline should refer to the interim order and current legislation as these can change from time to time. As indicated in the interim order, in any case where the interim order and the regulation appear to be in conflict, the interim order prevails. Recreational flights of drones from 250 grams to 35 kilograms may take place subject to the following provisions which have been organised for the reader and additional information provided to add context to aid the reader in understanding the restrictions.

!	Offence	Personal Fine	Corporate Fine
	Violation of any items identified in Interim Order No.8	$3,000	$15,000

Location Restrictions:

No person shall operate a model aircraft:

- within controlled airspace;
- within restricted airspace;
- inside an aerodrome control zone;
- over or within an area of natural hazard or disaster;
- over or within the security perimeter of a police or first responder emergency operation site;
- over or within any area that is located within 9 km of an area of natural hazard or disaster;
- within 3 nautical miles (5.5 km) of the centre of an aerodrome, except a heliport or an aerodrome that is used exclusively by helicopters;
- within 1 nautical mile (1.8 km) of a heliport or an aerodrome that is used exclusively by helicopters;

Some of these restrictions refer to controlled airspace, restricted airspace, and control zones. Figure 2 below indicates the impact of these restrictions and aerodrome restrictions in the Montreal area. To better understand to what each of these terms refer to will require a better understanding of Canadian Airspace.

!	Helpful Hint
	Both campuses of Concordia University are within the location restrictions of controlled airspace of an aerodrome control zone. A flight operation under the Interim Order is not possible on our campuses and will result in a fine.

Mass Specific Restrictions:

For model aircraft greater than 250 g to 1 kg:

No person shall operate a model aircraft at a lateral distance of less than 100 feet (30 m) from vehicles, vessels or the public, including spectators, bystanders or any person not associated with the operation of the aircraft.

For model aircraft greater than 1 kg to 35 kg:
No person shall operate a model aircraft at a lateral distance of less than 250 feet (75 m) from vehicles, vessels or the public, including spectators, bystanders or any person not associated with the operation of the aircraft.

General Restrictions:
No person shall operate more than one model aircraft at a time.
No person shall operate a model aircraft:

- at a lateral distance of more than 1640 feet (500 m) from the person's location;
- at an altitude greater than 300 feet AGL;
- over or within an open-air assembly of persons;
- at night;
- in cloud;

General Requirements:
A person operating a model aircraft must:

- give way to manned aircraft at all times;
- ensure that it is operated within VLOS at all times during the flight;

!	Helpful Hint
	The Visual Line Of Sight (VLOS) requirement takes precedence over the '500 metres from the pilot' restriction. If conditions limit VLOS to less than 500 m, the maximum operating distance is the lesser of the two.

And the owner of a model aircraft shall make clearly visible on the model aircraft:

- the name;
- address;
- and telephone number of the owner;

!	Helpful Hint
	Immediately label the model aircraft with the name, address, and telephone number of the owner.

Violation of any of these provisions may carry a penalty of $3,000 for an individual and up to $15,000 for a corporation.

The map in figure 2 has been provided to give a rough indication of restrictions in nearby airspace. The shaded discs indicate the 5.5 km radius from centre of aerodromes and water aerodromes and the 1.8 km radius from centre of heliports. The shaded area with a yellow border also indicates the designated aerodrome control zones in the area. The control zones in these areas extend from ground to 3000 feet AGL and flights in these control zones are subject to Air Traffic Control (ATC) of the aerodrome. It is important to note that large portions of the North Shore, Laval, Montreal, and the South Shore are

inside various aerodrome control zones so an operator flying a model aircraft greater than 250 grams in these areas is subject to a fine.

It is also useful to note that both campuses of Concordia University are within the aerodrome control zone of the air traffic control tower at YUL, and as such, model aircraft may not be flown on either of our campuses under Interim Order No. 8.

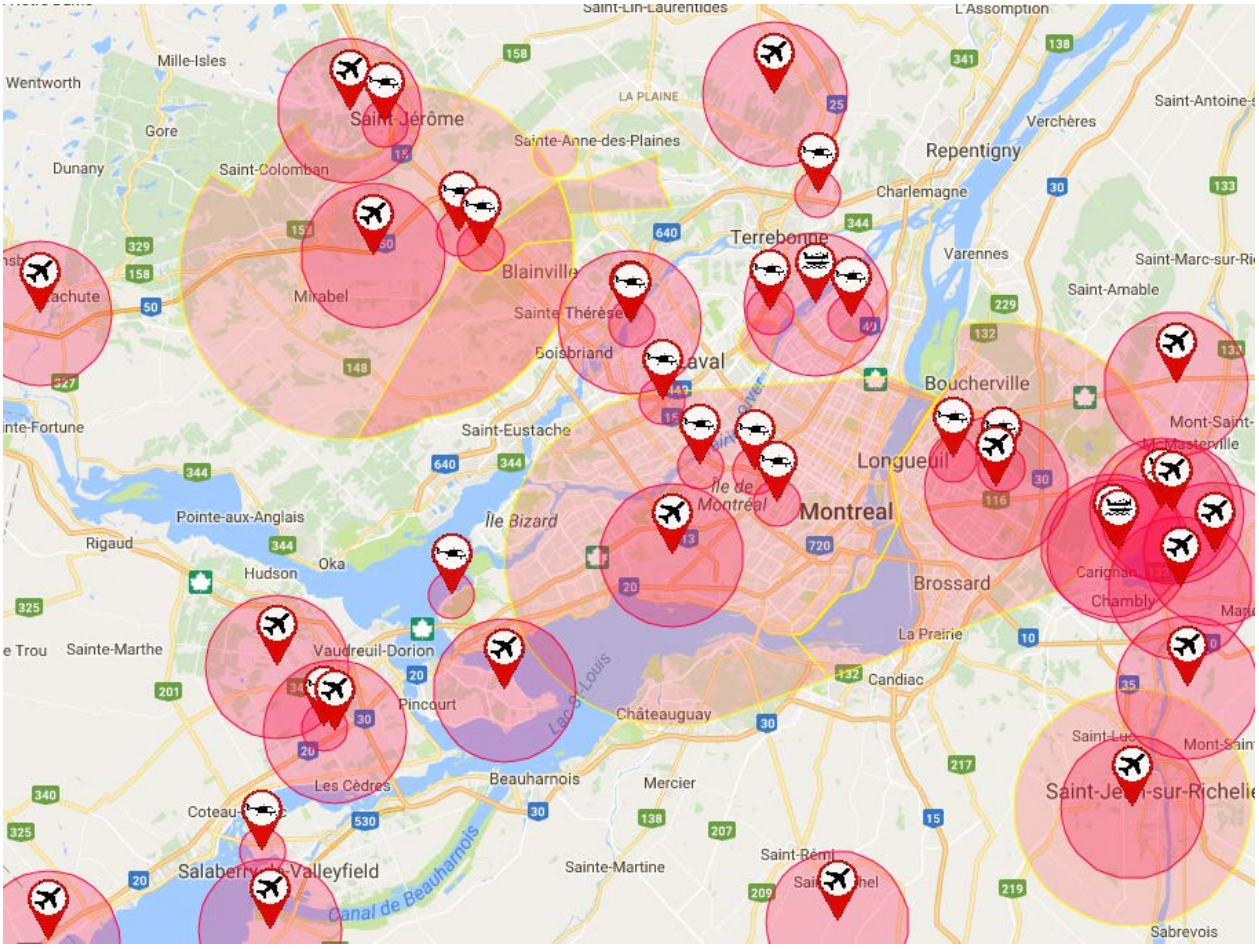


Figure 2. Map showing interim order distances from aerodromes, water aerodromes, heliports, and aerodrome control zones in and around the Montreal area. Taken using the NRC UAV site selection tool 08/31/2017. Not to be used as the final authority for airspace designation. See NRC disclaimer.

Conditions of the Exemptions

Users of this guideline should refer to the Transport Canada published exemption conditions and current legislation as these can change from time to time. The minister of transport has created these exemption conditions after having determined that they are in the public interest and not likely to adversely affect aviation safety. Operating under the exemption removes the SFOC requirements of sections 602.41 and 603.66 of the Canadian Aviation Regulations. However, all conditions must be met; failing that, the SFOC is required.

There are 43 exemption conditions to be met in all if the UAV is 1 kg or less. There are 61 conditions for UAV greater than 1kg and up to 25 kg. The conditions listed below are common to both sets of exemptions. Not all exemption conditions are included in this document but those highlighted are the more restrictive or informative elements, or those relevant to university operations.

The UAV pilot shall only operate:

- within Class G airspace;
- with no less than $100,000 in liability insurance as per 606.02 (8) of the CARs;
- with permission from the property owner(s);
- NOT in restricted airspace;
- NOT in any control zone;

!	Offence	Personal Fine	Corporate Fine
	Violation of section 606.02 (8) of the CARs	$5,000	$25,000

Both campuses of Concordia University are in the Class C control zone indicated by the yellow bordered area in figure 3. This means flying under an exemption will not be possible on either campus.

!	Helpful Hint
	Both campuses of Concordia University are within the Class C Control Zone of YUL ATC, hence not Class G airspace. A flight operation under the Exemption Conditions is not possible in these locations and will result in a fine.

Additionally, the permission from the property owner is required as well as proof of liability insurance coverage with a minimum coverage of $100,000. In submitting the request for permission to fly, Concordia will evaluate the request and if it is possible to proceed, the operator will be required to obtain the SFOC as the exemption conditions currently cannot be adhered to.

!	Helpful Hint
	The operator is responsible for securing a minimum of $100,000 coverage in accordance with 606.02 (8) of the CARs. Homeowner liability insurance will not usually extend to aviation related coverage.

	However, it may be possible to add a UAV rider to your current insurance.

Additional restrictions apply as follows.

The UAV pilot shall not operate:

- over or within an open-air assembly of persons;
- over or within a forest fire area or within five (5) nautical miles of a forest fire area;
- within five (5) nautical miles from the centre of any listed aerodrome, excluding heliports;
- within three (3) nautical miles from the centre of any listed heliport or any aerodrome not listed;

!	Helpful Hint The Canada Flight Supplement and the Water Aerodrome Supplement are two NAV Canada published documents that list aerodromes.

The term 'listed' above indicates that operator must verify the presence of aerodromes and heliports according to documents published by NAV Canada entitled Canada Flight Supplement and the Water Aerodrome Supplement. It is worthwhile noting the operator is also responsible for being aware of any aerodromes not listed in these supplements and maintaining a minimum distance of 5.5 km from these aerodromes.

The UAV pilot shall only operate:

- below 300 feet AGL;
- using VLOS, including observing nearby airspace, to avoid air traffic and obstacles;
- no more than one UAV at a time;
- clear of cloud with not less than two (2) statute miles ground visibility;
- provided a copy of the following documents are accessible to any person conducting operations under this exemption and these documents must be made immediately available to a peace officer, police officer, or Transport Canada inspector upon request:
    1. The exemption;
    2. Proof of liability insurance coverage;
    3. Name, address and telephone number of the UAV operator;
    4. A copy of the UAV system operating limitations; and
    5. Evidence that the training required below has been completed.

Other restrictions:

There are other restrictions regarding the pilot operating with first person view (not allowed), pilot alcohol use (minimum 8 hours elapsed) and drug use impairing faculties. Pilot fatigue, pilot minimum age or required supervision, the operation presenting no risk to aviation safety, life or property, and not extending operational areas by using visual observers or control relays is also addressed. The pilot must also be prepared to take manual control of the UAV at any time, and always give way to manned aircraft. In regions of multiple UAV in flight, the same rules as boat safety apply and the UAV operator must cede the right of way to the UAV on its right. The operator must have emergency procedures

prepared and ready to be used for lost link and fly-away situations. These are often addressed by the UAV manufacturer.

There are additional conditions concerning the operator performing site surveys prior to flight, UAV maintenance and fitness for flight, and the operator following manufacturer instructions for maintenance and emergency conditions.

The operator must also immediately advise the appropriate air traffic service unit if the UAV inadvertently enters into controlled airspace, so contact information for the ATC tower responsible for the control zone is required. If this contact has not been established, the operator should contact the NAV CANADA National Operations Centre at 613-563-5626 and provide the details of the situation (e.g. type of UAV, last known altitude, direction it was flying, remaining flight time, etc.)

!	Helpful Hint
	Fly-Away or loss of the command and control link resulting in UAV intrusion into controlled airspace is a major aviation safety concern. If the ATC responsible for the airspace cannot be informed, contact: **NAV CANADA** ***National Operations Centre*** **613-563-5626**

The exemptions also include the following two items:

- Any person conducting operations under this exemption shall be familiar with the relevant aeronautical information that is appropriate to the intended flight, before commencing a flight.
- The pilot conducting operations under this exemption shall have the appropriate knowledge, training on the UAV system and qualifications for the area and type of operation, as referred to in Transport Canada Advisory Circular 600-004.

Appropriate knowledge is defined in AC 600-004 as understanding airspace classification and structure, being familiar with meteorological and NOTAM reporting services, interpretation of aeronautical charts and the Canada Flight Supplement/Water Aerodrome Supplement as well as applicable content of the CARs. The Aeronautical Information Manual (AIM) is also considered an excellent source of information.

The reader is encouraged to refer to the Transport Canada publication “Knowledge requirements for Pilots operating Unmanned Air Vehicle Systems (UAV) 25 Kg or less, Operating within visual line-of-sight” for more information.[xiv]

Specific Exemption Conditions for UAV 1kg and under

These restrictions are included in the exemption conditions but differ between the two sets of conditions based on the mass of the UAV. They have been identified and separated according to their application for total mass of UAV with payload being one kilogram (1 kg) or less.

The UAV pilot shall operate:

- NOT over or within a built up area;

!	Helpful Hint
	See the definition of 'built up area' to understand this restriction better.

- within one-quarter (¼) nautical mile of pilot;

!	Helpful Hint
	The Visual Line Of Sight (VLOS) requirement takes precedence over the '¼ nautical mile (nm) from the pilot' restriction. If conditions limit VLOS to less than the ¼ nm, the maximum operating distance will be the lesser of the two. ¼ nm is approximately 460 m.

- at least 100 feet from the general public, spectators, bystanders or any person not associated with the operation;
- a lateral distance of at least 100 feet away from any building, structure, vehicle, vessel, animal or persons unless:
    1. The building, structure, vehicle, vessel or animal is the subject of the aerial work; and
    2. Only persons inherent to the operation are present.
- with NO explosive, corrosive, flammable, bio-hazard or bright light emitting (laser) payloads;

Specific Exemption Conditions for UAV greater then 1kg up to 25 kg

These restrictions are included in the exemption conditions but differ between the two sets of conditions. They have been identified and separated according to their application.

The UAV pilot shall operate:

- at least three (3) nautical miles from a built up area;

!	Helpful Hint
	With the current definition of 'built up area' the exemption conditions cannot be met within the confines of, or near, most inhabited areas.

- within one-half (½) nautical mile of pilot;

!	Helpful Hint
	The Visual Line Of Sight (VLOS) requirement takes precedence over the '½ nautical mile (nm) from the pilot' restriction. If conditions limit VLOS to less than ½ nm, the maximum operating distance will be the lesser of the two. ½ nm is approximately 900 m.

- at least 500 feet from the general public, spectators, bystanders or any person not associated with the operation;
- a lateral distance of at least 500 feet away from any building, structure, vehicle, vessel, animal or persons unless:
    1. The building, structure, vehicle, vessel or animal is the subject of the aerial work; and
    2. Only persons inherent to the operation are present.
- with NO explosive, corrosive, flammable, bio-hazard or bright light emitting (laser) payloads, or any payloads that can be jettisoned, dispersed or dropped;

The UAV pilot shall avoid:

- icing conditions;
- presence of frost, ice, snow, on critical UAV surfaces;
- electronics at the control station that may interfere with or impair function of the UAV system;
- activating a flight termination system that may endanger airspace users, or persons or property on the ground;
- take-off, approach, landing routes and traffic areas of manned aircraft;
- ADIZ (Canadian Air Defence Identification Zone);
- ELT (Emergency Locator Transmitter) use – operator must disengage, remove or make inoperable the ELT unit, if the UAV is so equipped;

The UAV pilot shall, prior to launch:

- Follow manufacturer airworthiness directives;

- Perform maintenance, service, disassembly-assembly according to manufacturer specifications;
- Inspect for damage and repair UAV if it has been subjected to any abnormal occurrence;
- Assess lost link risk and determine when auto-recovery or flight termination shall be initiated;
- Establish and follow procedures for
    - contacting emergency responders
    - safe landing and recovery of UAV
    - contacting air traffic service unit
    - name persons responsible for each of the above
- Establish and follow Emergency Contingency Plan
- Make available operational and emergency equipment including checklists, placards, and appropriate fire extinguishers;

The UAV pilot shall cease operations and report:

- Injuries;
- Unintended contact between the UAV and persons, livestock, vehicles, vessels, or other structures;
- Damage to airframe, control station, payload or command and control links;
- Departures from designated geographic boundaries or altitude limits;
- Collisions or risk of collisions with another aircraft;
- UAV uncontrollable, fly-away, or UAV missing;
- Any incident that results in a Canadian Aviation Daily Occurrence Report (CADOR);

Flying under Exemption Conditions

In the event all the exemption conditions can be met, a notification is required to be submitted to Transport Canada prior to flight operations. In this notification, the operator must indicate they have read and understood the exemption conditions, will only engage in flight operations in Class G airspace, and will maintain appropriate distances from aerodromes and built up areas.

The reader must refer to the official exemption conditions on the Transport Canada site before attesting you have read and understood them. The information provided in this document is skeletal in nature, carries no regulatory weight, and is meant to be used as an informative guideline only. Much greater detail can be found in the AC 600-004 “Guidance Material for Operating Unmanned Air Vehicle Systems under an Exemption”.

Applying for the SFOC

Transport Canada now makes available an SFOC Application Form for flight operations that cannot meet the specified exemption conditions. The type of application in section 2 must be specified as 'Complex', 'Site-Specific' for outdoor flights at Concordia University. A 'Standing' application will only be given to applicants that have a proven track record of safe operations, which is only obtained through multiple SFOC applications being approved and executed without issue.

Outdoor flight operations on University premises will require written permission from Concordia University, and to avoid delays, the letter of authorization should be included in the SFOC application. Hence, the Request for Permission to Fly must be completed, submitted to EHS, and processed before the SFOC application can be submitted to the Quebec Region Civil Aviation Regional Office in Dorval, Qc.

!	Helpful Hint
	The Concordia letter of authorisation should be sent with the SFOC application. Submit the Concordia documents to EHS first.

Additionally, outdoor flight operations at Concordia University will require a minimum of $100,000 liability insurance coverage that is the responsibility of the applicant to secure. This requirement is identified in the Civil Aviation Regulation section 606.02(8)(a) as follows:

(8) No aircraft owner not referred to in paragraph (2)(a), (b) or (c) shall operate an aircraft unless, in respect of every incident related to the operation of the aircraft, the owner has subscribed for liability insurance covering risks of public liability in an amount that is not less than

(a) $100,000, where the maximum permissible take-off weight of the aircraft is 1 043 kg (2,300 pounds) or less;

[…]

!	Offence	Personal Fine	Corporate Fine
	Violation of section 606.02 (8) of the CARs	$5,000	$25,000

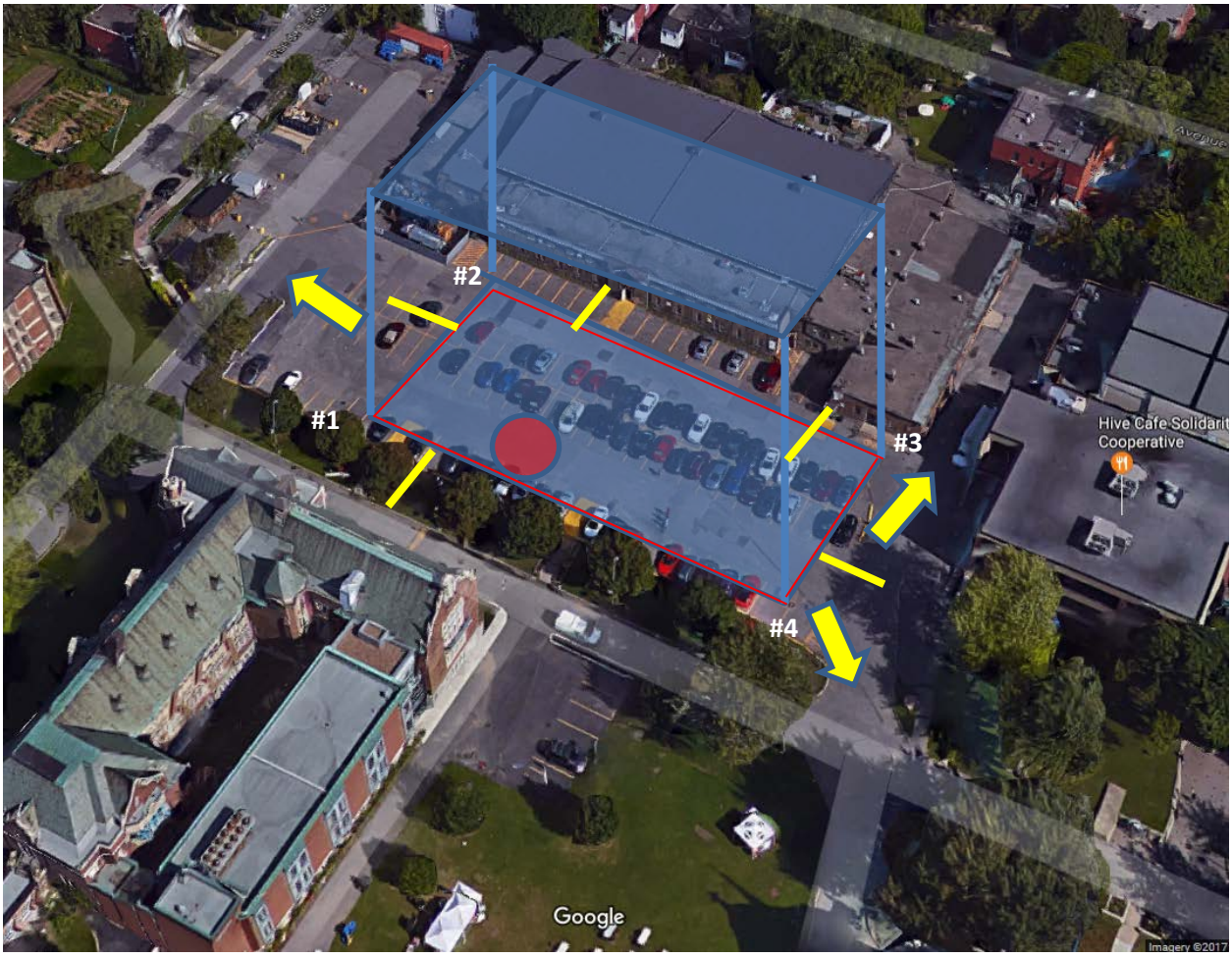
The liability insurance policy number, company name, and policy value are required information in section four (4) of the SFOC application, so coverage will be required prior to submitting the SFOC application. The applicant must also complete a Site Survey/Plan of Operation as well as a Security Plan and an Emergency Plan.

In section five (5) the applicant should specify they will only be operating within VLOS, below 400 feet AGL, and in the daytime only. The airspace is Class C at both Concordia campuses.

The applicant must show an aerial view of the planned site of operations, indicate the nearby aerodromes and air traffic routes as applicable, identify with GPS coordinates the limits of the operation area, identify site security elements, operator control area, launch/landing areas, and identify emergency access routes.

The following examples are included to illustrate some of the elements required to be included in the SFOC application:

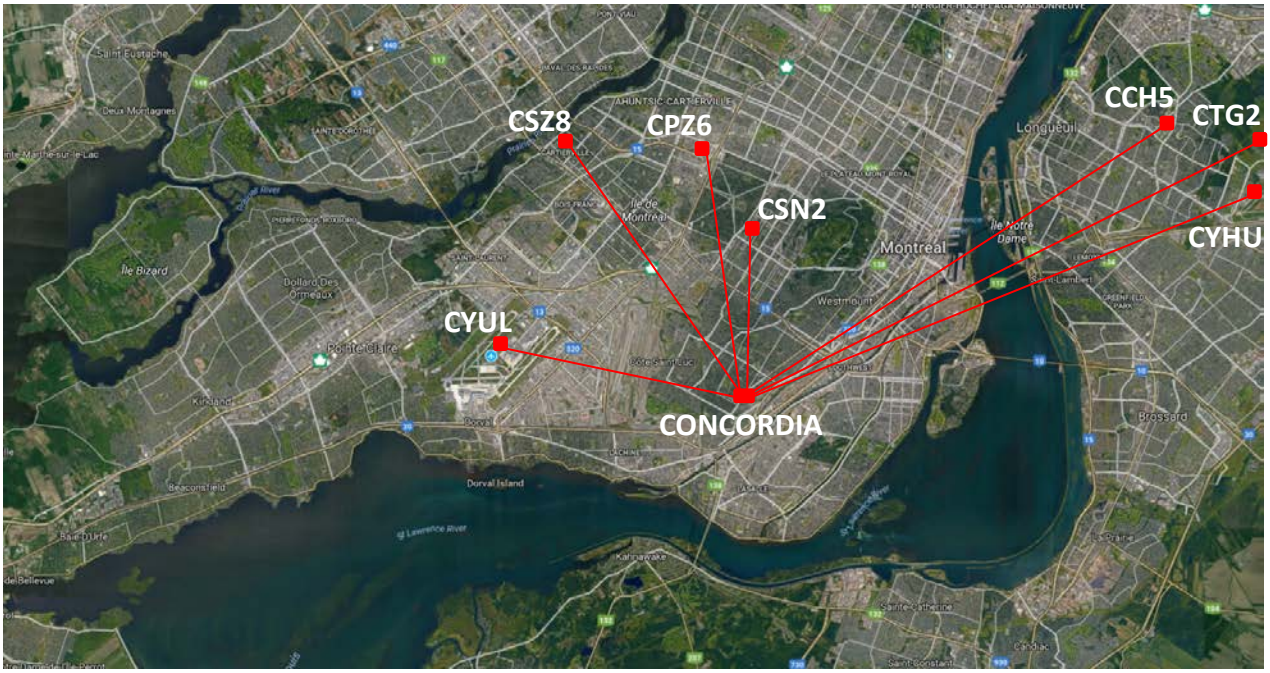
Example 1. Intended flight area identified as a volume (in blue), to a maximum height indicated in the application, the security perimeter to be defined (red line), and the area of flight operations identified (red circle) and clearance distances to be indicated (yellow lines) and 30 m distances to be identified.



It is further advisable to include details concerning where sentry personnel or visual observers (yellow arrows) will be placed to secure the site from unwanted pedestrian or vehicle traffic and to identify the limits of the field of operations with the GPS coordinates corresponding to #1 - #4. It is necessary to identify that only those involved with the UAV operation will be allowed in the security perimeter.

The Transport Canada employees at the Civil Aviation Office that review the SFOC application want to have clear indicators that the applicants understand airspace designations and are aware of aviation safety needs. The applicant is also required to provide a map indicating the distances to the aerodromes in the area.

Example 2. This illustrates some of the aerodromes that can be found near the Loyola campus. The applicant is encouraged to look at (unofficial) online tools available from Telus and the NRC, as well as official documents from NAV Canada such as the Water Aerodrome Supplement and the Canada Flight Supplement. Other useful documents include the Designated Airspace Handbook and the Canadian Airport Charts.



The SFOC application provides an example and indicates additional details that should be provided.

Canadian Airspace – Montreal Region – Non-Recreational

The Ministry of Transport publishes an updated copy of the Designated Airspace Handbook[xv] every 57 days to identify the different airspace designations in Canada. This Handbook brings together civil airspace designations as well as military airspace designations. The information in the Designated Airspace Handbook (DAH) is considered current unless a NOTAM (Notice to Air Men) has been published regarding an airspace, in which case the NOTAM supersedes the relevant section of the DAH. This handbook identifies the Control Zone in the Montreal area as Class C airspace, from ground level to 3000 feet, or about 2900 feet AAE, giving specific GPS coordinates for the border of this control zone.

Flying under exemption conditions and the interim order requires the use of Class G airspace. Class G airspace is defined as any airspace that has not been designated Class A, B, C, D, E, or F. Where air traffic control is provided to pilots, this cannot be Class G airspace.

Class G airspace is uncontrolled airspace, although it remains regulated airspace. The location restrictions found in the exemptions and the interim order also exclude transponder airspace, restricted airspace, control zones, controlled airspace and areas with higher volumes of manned aviation.

Note: At no time does the Designated Airspace Handbook designate any airspace as Class G airspace. It is up to the operator to determine the airspace in question has been excluded from being designated A, B, C, D, E, or F, and that the airspace is in fact uncontrolled airspace. The DAH designates different geographic boundaries indicated by GPS coordinates, up to different altitudes, to these 6 classes of airspace. Additional designations concerning restricted airspace, transponder airspace and control zones are given, again to various altitudes in reference to various geographic boundaries.

Figure 3 shows the Montreal area with aerodromes and heliports; the yellow boundary shows the Class C Air Traffic Control Zone that places limitations on flight activities in the Montreal area. This mapping is consistent with the GPS coordinates given in the Designated Airspace Handbook.

The image was taken from a UAV site selection tool from the NRC that shows the control areas, airports, aerodromes, heliports, etc. in Canada that impose minimum distance restrictions on flying. The NRC site is for reference only and has no official standing[xvi]. The UAV operator/owner has the responsibility to determine whether they are permitted to fly in the area they choose, and to acquire the appropriate permission.

Please also note that the restriction zones around aerodromes and heliports are larger for non-recreational flights as compared to recreational flights, as can be observed in comparing figure 2 to figure 3.

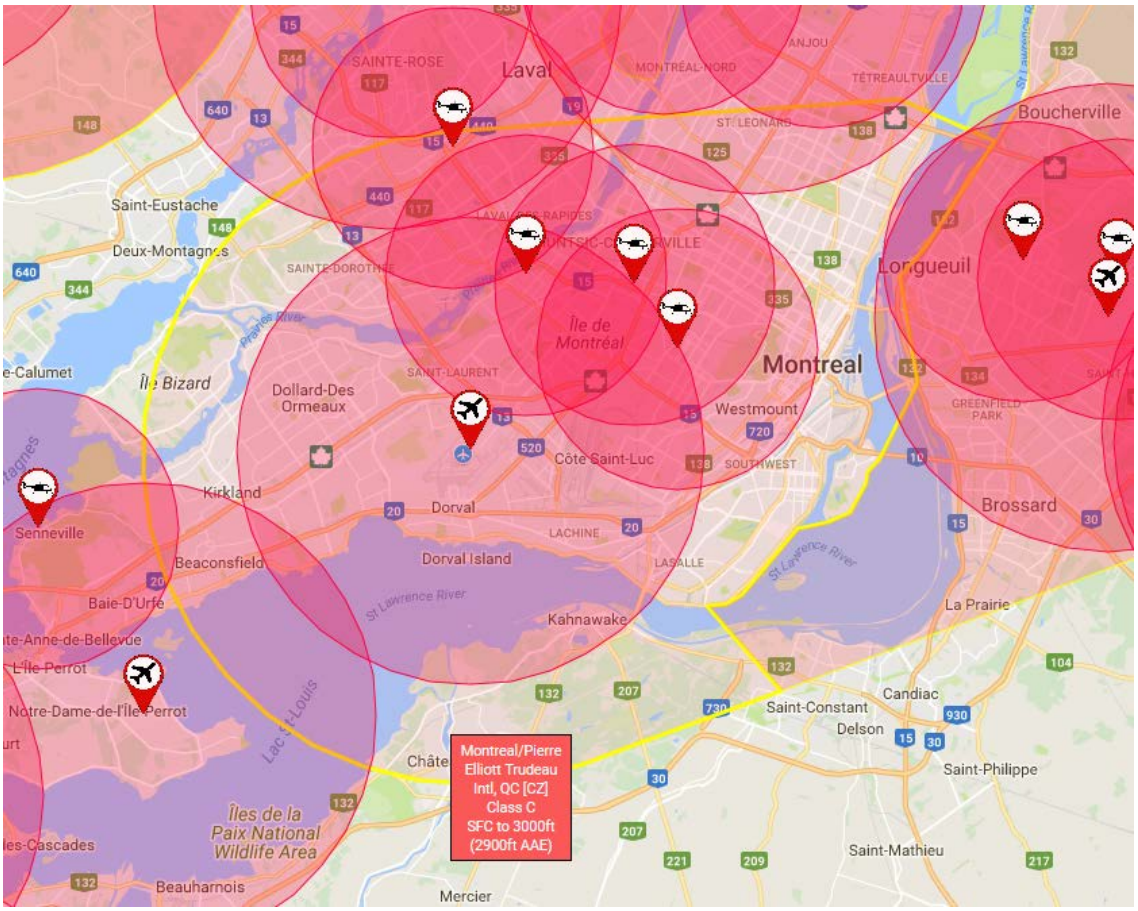


Figure 3. Map showing exemption condition distances from aerodromes, water aerodromes, heliports, and aerodrome control zones in and around the Montreal area. Taken using the NRC UAV site selection tool 08/31/2017. Not to be used as the final authority for airspace designation. See NRC disclaimer.

Outdoor Operations at Concordia

Both campuses of Concordia University are within **Class C** Control Zone from ground level to 3000 feet above aerodrome elevation (AAE), as indicated in the Designated Airspace Handbook, August 2017 edition.

Both campuses are under the controlled airspace of the air traffic control tower at Pierre Elliot Trudeau International airport (CYUL).

Furthermore, both campuses fall within the 3 nautical mile or 5 nautical mile restriction zones of nearby airports or heliports, as would be applied for flights of a non-recreational purpose.

In all cases concerning outdoor flight operations on Concordia University premises, the Interim Order and the Exemption Conditions cannot be satisfied. The SFOC will be required from TC.

At Concordia, flying UAV may be required in research or teaching, by UAVConcordia, ConcordiaSAE or other student organizations, for media and communications use, or for facilities related work. Even external contractors may be asked to perform work where UAV use may be required. Prior to flight, the individual or organisation responsible for the UAV must obtain permission to fly in or on University premises from Concordia University.

In all cases, every UAV must be registered with the EHS office.

Indoor Operations at Concordia

Indoor operations of UAV do not pose a risk to aviation safety. As such the Staff Instruction for Transport Canada staff evaluating the SFOC application indicates the following[xvii].

> The following TC policies apply when operating a UAV inside a building/structure or in a subterranean environment:
>
> - Where only the UAV crew is present ***an SFOC is not required***.
> - Where only the UAV crew and people directly participating in the UAV operation are present (e.g. actors on a movie set) and no spectators or invited assembly of persons are present, ***an SFOC is not required***. The UAV operator should ensure that all those participating in the operation are briefed on any potential hazards or risks.
> - Where there are people within the structure who are not part of the UAV operation (e.g. spectators at a sporting event, participants at trade show demonstrations, etc.) ***an SFOC is required***. The Certificate applicant should refer to the appropriate SFOC application process in this Staff Instruction for further guidance.
>
> In all the above situations, the UAV operator shall gain consent of the land/property owner prior to any such operation.

Based on this staff instruction, Concordia University has adopted an Internal UAV Permit system to manage requests for flight operations indoors at the university. This method allows the university to assess if the security and controls of the space to be used for the flight operations will satisfy the Staff Instruction for the first two items not requiring the SFOC.

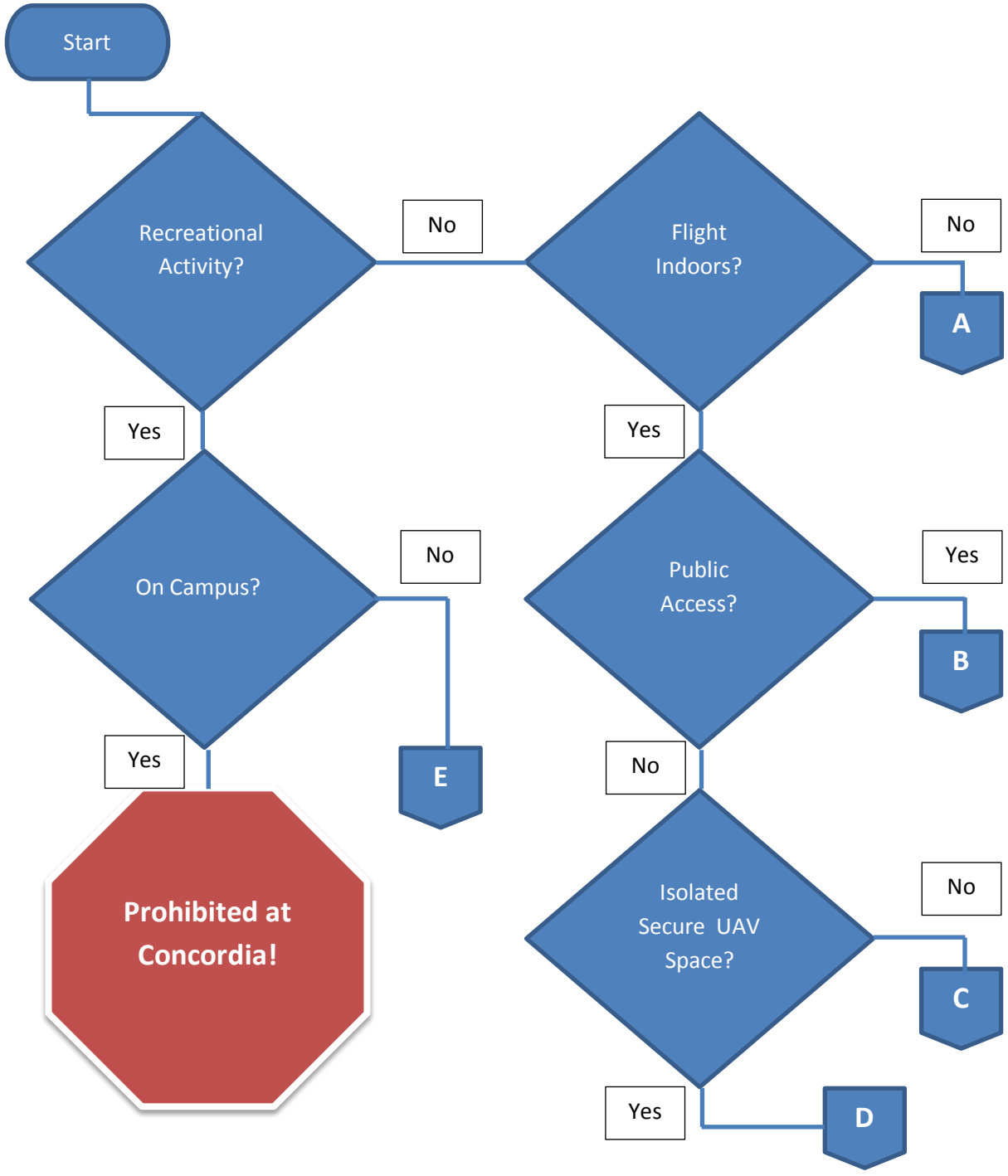
For this reason, the applicant for an internal UAV permit must submit site security plans with the application detailing the access controls and the physical and procedural controls used to separate UAV operations from other occupants of the space. For those applicants having a secure space, an onsite visit by EHS may replace the site security plan, or alternatively, additional information may be requested.

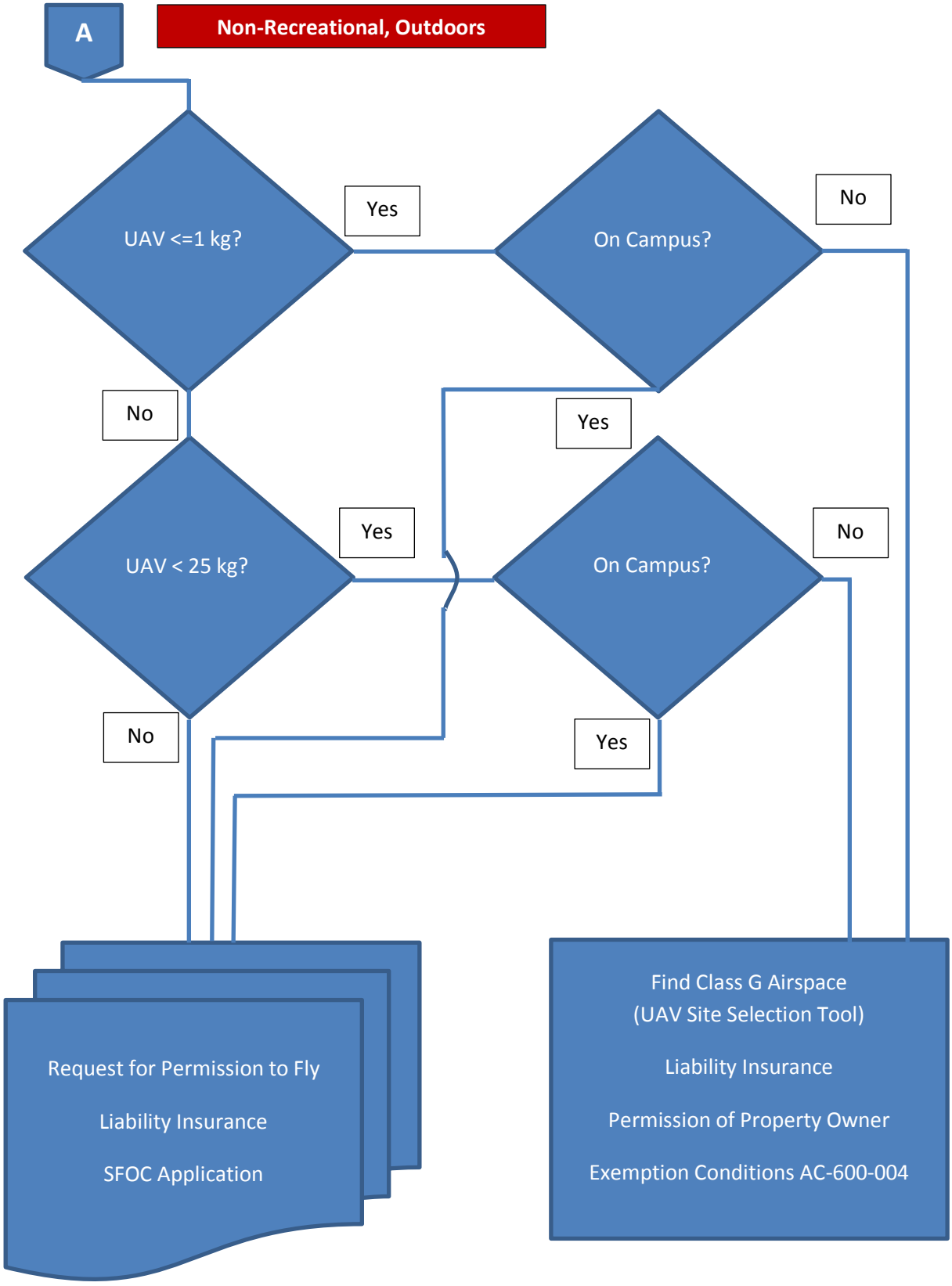
In the event the request for an internal permit does not control the presence of the general public during the flight operation, the internal permit request can be processed by EHS as a request for permission to fly but the applicant will also require an SFOC from Transport Canada. The applicant will be informed of this requirement by EHS.

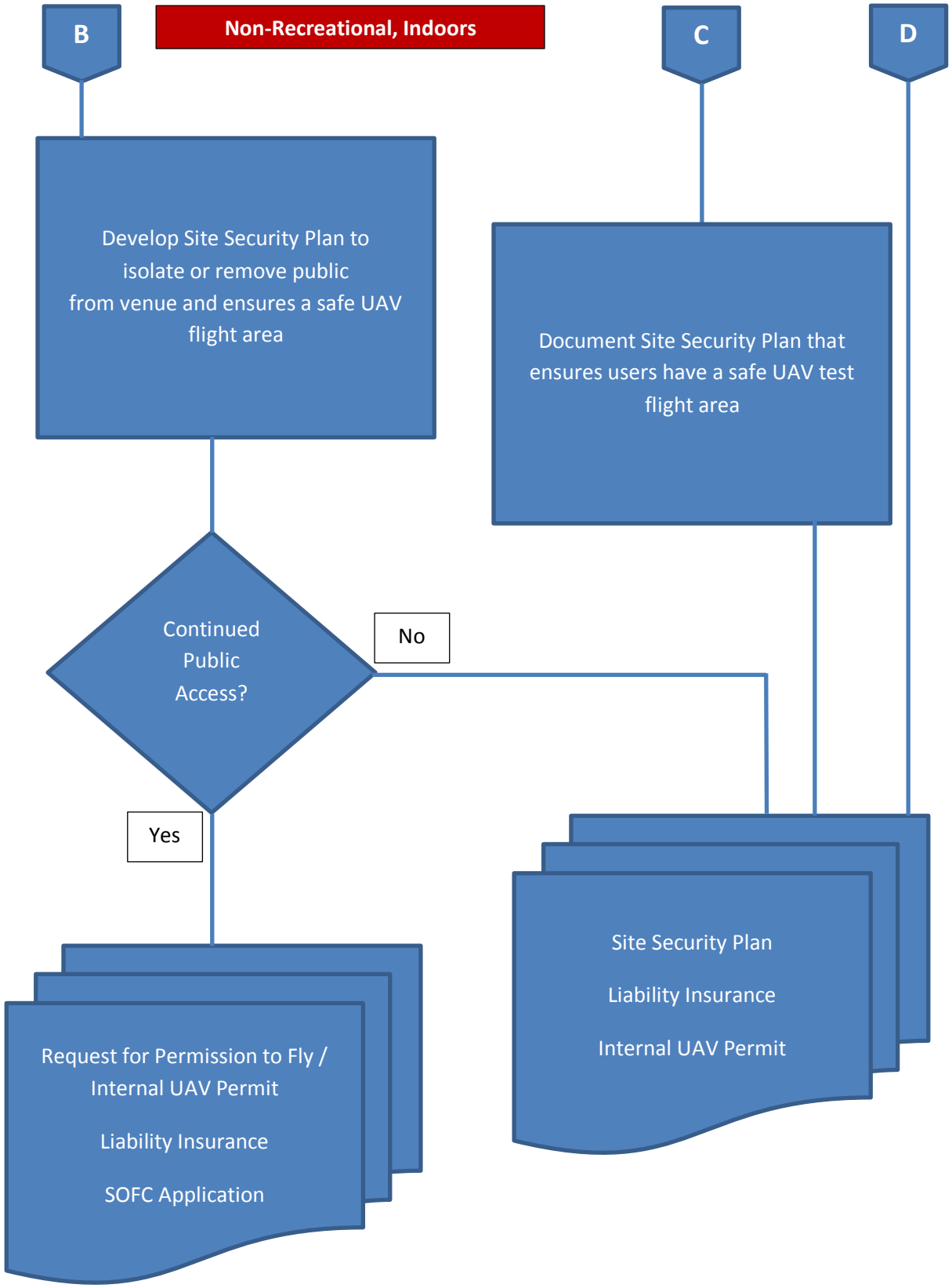
The detailed process chart that follows illustrates these situations.

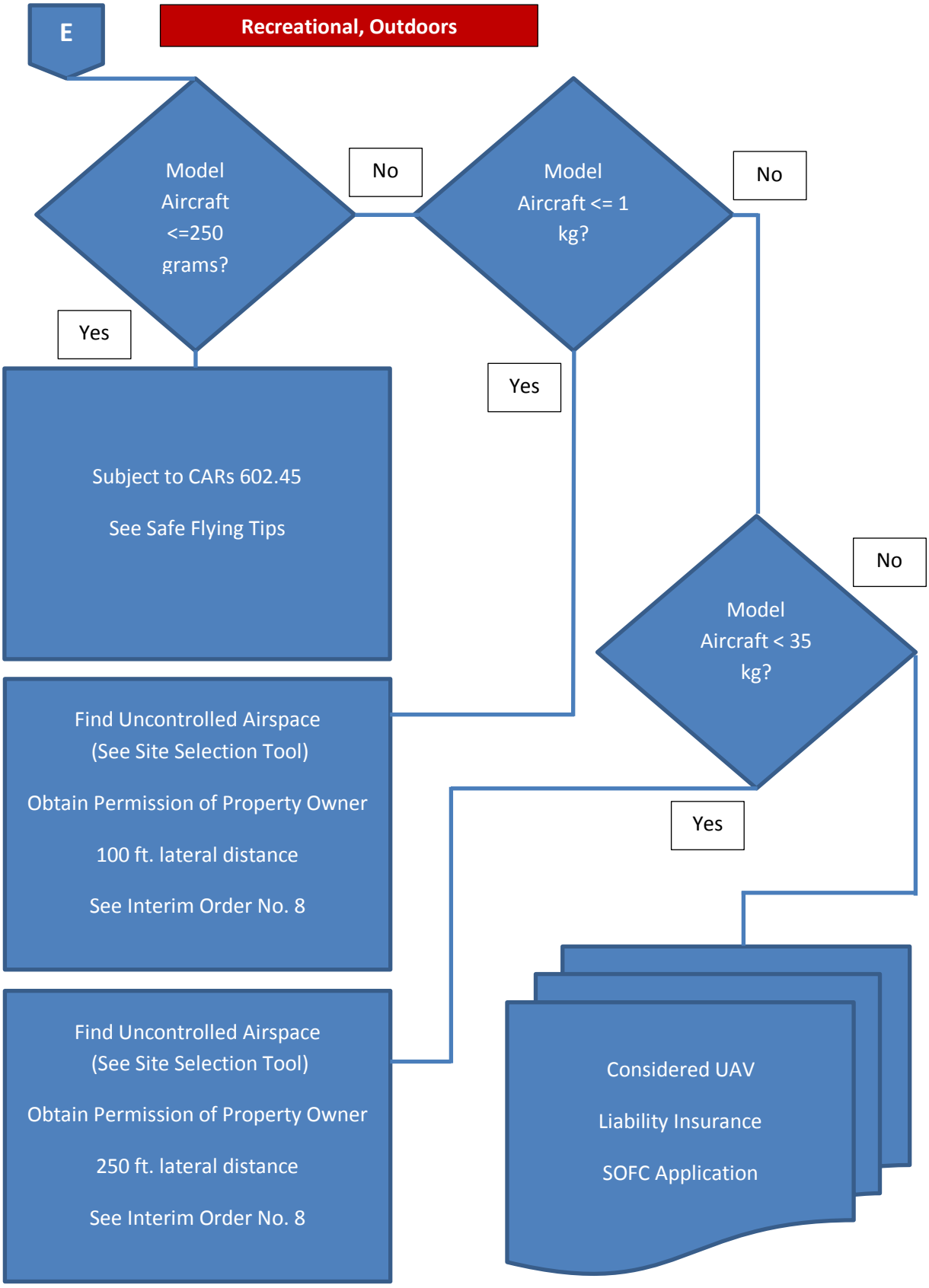
Flying Process Chart

Indoor flight operations at the University are handled internally. The UAV decision tree (EHS-DOC-151) has been prepared to help you determine what document you will need to use to fly your UAV at Concordia and what the process entails. The Decision tree found here encompasses all possible flight options and so it incorporates Concordia University flight conditions as well as Transport Canada flight conditions.




A
Non-Recreational, Outdoors
UAV <=1 kg?
Yes
On Campus?
No
No
Yes
UAV < 25 kg?
Yes
On Campus?
No
No
Yes
Request for Permission to Fly
Liability Insurance
SFOC Application
Find Class G Airspace
(UAV Site Selection Tool)
Liability Insurance
Permission of Property Owner
Exemption Conditions AC-600-004


B
Non-Recreational, Indoors
C
D
Develop Site Security Plan to isolate or remove public from venue and ensures a safe UAV flight area
Document Site Security Plan that ensures users have a safe UAV test flight area
Continued Public Access?
No
Yes
Request for Permission to Fly / Internal UAV Permit
Liability Insurance
SOFC Application
Site Security Plan
Liability Insurance
Internal UAV Permit


E
Recreational, Outdoors
Model Aircraft <=250 grams?
No
Model Aircraft <= 1 kg?
No
Yes
Yes
Subject to CARs 602.45
See Safe Flying Tips
Model Aircraft < 35 kg?
No
Yes
Find Uncontrolled Airspace (See Site Selection Tool)
Obtain Permission of Property Owner
100 ft. lateral distance
See Interim Order No. 8
Find Uncontrolled Airspace (See Site Selection Tool)
Obtain Permission of Property Owner
250 ft. lateral distance
See Interim Order No. 8
Considered UAV
Liability Insurance
SOFC Application

Tips for recreational drone users (drones 250 g and under)

- Operate safely.
- Fly your drone during daylight and in good weather, avoiding fog, rain, snow, ice, adverse visibility, and significant wind.
- Keep your drone where you can see it with your own eyes – don't fly using an on-board camera, monitor or smartphone.
- Make sure your drone is safe for flight before take-off:
    - Are the batteries fully charged?
    - Is it too cold to fly? (temperature affects battery performance)
    - Have you performed pre-flight tests to determine the drone is operable, undamaged, and responding well?
    - Is the firmware and software up to date?
    - Are there persons or obstacles in the area?
    - Are there rotor guards installed on your drone?
- Respect the privacy of others and do not fly over private property.
- Do not take photos or videos without permission.
- Do not fly over assemblies of people (e.g. sporting events, concerts, beaches, etc).
- Know the classification of the airspace. It would be unsafe for you to operate in airspace with heavy aircraft traffic, such as around airports.
- Have an emergency plan just in case (e.g. incident, accident, medical emergency, fly-away or non-responsive drone).
- Avoid restricted airspace (e.g. National Parks, forest fire areas, prisons, near airports or in military airspace)
- Do not fly where or when you could interfere with any first responders (e.g. fire department, police, ambulance/medical)
- Always give way to manned aircraft (e.g. includes hot air balloons, gliders, ultra-light planes, powered parachutes, planes and helicopters).
- Do not operate with any dangerous goods or lasers on the drone.

Summary of Flight Requirements

Current Transport Canada Regimes:

UAV Mass Range	Recreational	Non-Recreational Research, work, other
0-250 grams	Safe Flying tips	Exemption conditions (1kg and less) to be met or SFOC required
0.250 – 1.0 kilograms	Interim Order No. 8 TC Infographic – flying for fun	Exemption conditions (1kg and less) to be met or SFOC required
1.0 – 25.0 kilograms	Interim Order No. 8 TC Infographic – flying for fun	Exemption conditions (1.0 to 25.0 kg) to be met or SFOC required
25.0-35.0 kilograms	Interim Order No. 8 TC Infographic – flying for fun	SFOC automatically required
>35.0 kilograms	SFOC automatically required	SFOC automatically required

Concordia University Flight Requirements:

Flying UAV at Concordia University	
Outdoor Flight Operations	Indoor Flight Operations
UAV Registration	UAV Registration
Permission to Fly	Internal UAV Permit / Permission to Fly
Liability Insurance minimum $100,000	*Liability Insurance minimum $100,000
Site Security Plan	*Site Security Plan
SFOC from TC	*SFOC if general public may be present
* These may not be required depending on the type of UAV flight operations or the type of space being used for the flight operations.	

References

Concordia Documents:

UAV Decision Tree
UAV Registration Form
Internal UAV Permit Application
UAV Request for Permission to Fly

General:

TC Drone Main Page:
https://www.tc.gc.ca/eng/civilaviation/drone-safety.html
TC Drone Decision Tree:
https://www.tc.gc.ca/media/documents/ca-opssvs/Infographic_-_Do_I_need_permission_to_fly_my_drone.pdf
TC Drone FAQs:
https://www.tc.gc.ca/eng/civilaviation/opssvs/recreational-non-recreational-drone-operations-faq.html
NRC UAV Flight Site Selection Tool:
https://www.nrc-cnrc.gc.ca/eng/solutions/collaborative/civuas/uav_site_selection_tool.html
Telus Air Classification map:
http://www3.telus.net/cschwab/viewer/canadian_airspace.html
NAVCanada Designated Airspace Handbook (Large file - takes a while to load):
http://www.navcanada.ca/EN/products-and-services/Documents/DAH_Current_EN.pdf
Canadian Aviation Regulation:
http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-433/FullText.html#h-783
Knowledge Requirements for Pilots of UAV <25 kg Operating within VLOS:
https://www.tc.gc.ca/eng/civilaviation/publications/page-6557.html
Model Aeronautics Association of Canada:
http://www.maac.ca/en/

Non-Recreational:

TC Drone-Requesting Permission:
https://www.tc.gc.ca/eng/civilaviation/opssvs/getting-permission-fly-drone.html
TC-Exemption Conditions for UAV 1 kg and less:
http://www.tc.gc.ca/civilaviation/regserv/affairs/exemptions/docs/en/2880.htm
TC-Exemption Conditions for UAV >1kg to 25kg:
http://www.tc.gc.ca/civilaviation/regserv/affairs/exemptions/docs/en/2879.htm
TC-Applying for the SFOC:
http://www.tc.gc.ca/eng/civilaviation/opssvs/applying-special-flight-operations-certificate.html
TC-SFOC Application:
http://wwwapps.tc.gc.ca/Corp-Serv-Gen/5/forms-formulaires/download/26-0835_BO_PD
TC-Staff Instruction:
https://www.tc.gc.ca/eng/civilaviation/standards/general-recavi-uav-4161.html

TC Advisory Circular 600-004:
https://www.tc.gc.ca/eng/civilaviation/opssvs/ac-600-004-2136.html

Recreational:
TC-Recreational Flying Rules:
https://www.tc.gc.ca/eng/civilaviation/opssvs/flying-drone-safely-legally.html
TC-Interim Order No. 8 Regarding Recreational Use of UAV:
https://www.tc.gc.ca/eng/mediaroom/interim-order-respecting-use-model-aircraft.html
TC-Recreational UAV Flight Poster:
https://www.tc.gc.ca/media/documents/ca-opssvs/Flying_for_fun_EN-V6.pdf

References in the text:

[i] http://www.gazette.gc.ca/rp-pr/p1/2017/2017-07-15/html/reg2-eng.php
[ii] http://ici.radio-canada.ca/nouvelle/1003089/mysterieux-drone-retrouve-pres-piste-aeroport-montreal
[iii] http://montreal.ctvnews.ca/amateur-hour-in-the-skies-above-1.3213296
[iv] http://www.tvanouvelles.ca/2017/04/19/collision-avec-un-drone-evitee-de-peu-pour-un-avion-a-montreal
[v] https://arc.aiaa.org/doi/abs/10.2514/6.2017-0186
[vi] https://arc.aiaa.org/doi/abs/10.2514/6.2017-0187
[vii] https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/7880/index.do
[viii] http://laws-lois.justice.gc.ca/PDF/A-2.pdf
[ix] https://www.tc.gc.ca/eng/mediaroom/interim-order-respecting-use-model-aircraft.html
[x] http://www.gazette.gc.ca/rp-pr/p1/2017/2017-07-15/html/reg2-eng.php
[xi] https://www.tc.gc.ca/eng/civilaviation/opssvs/ac-600-004-2136.html
[xii] http://www.tc.gc.ca/civilaviation/regserv/affairs/exemptions/docs/en/2880.htm
[xiii] http://www.tc.gc.ca/civilaviation/regserv/affairs/exemptions/docs/en/2879.htm
[xiv] http://www.tc.gc.ca/eng/civilaviation/publications/page-6557.html
[xv] http://www.navcanada.ca/EN/products-and-services/Documents/DAH_Current_EN.pdf
[xvi] https://www.nrc-cnrc.gc.ca/eng/solutions/collaborative/civuas/uav_site_selection_tool.html
[xvii] https://www.tc.gc.ca/eng/civilaviation/standards/general-recavi-uav-4161.html